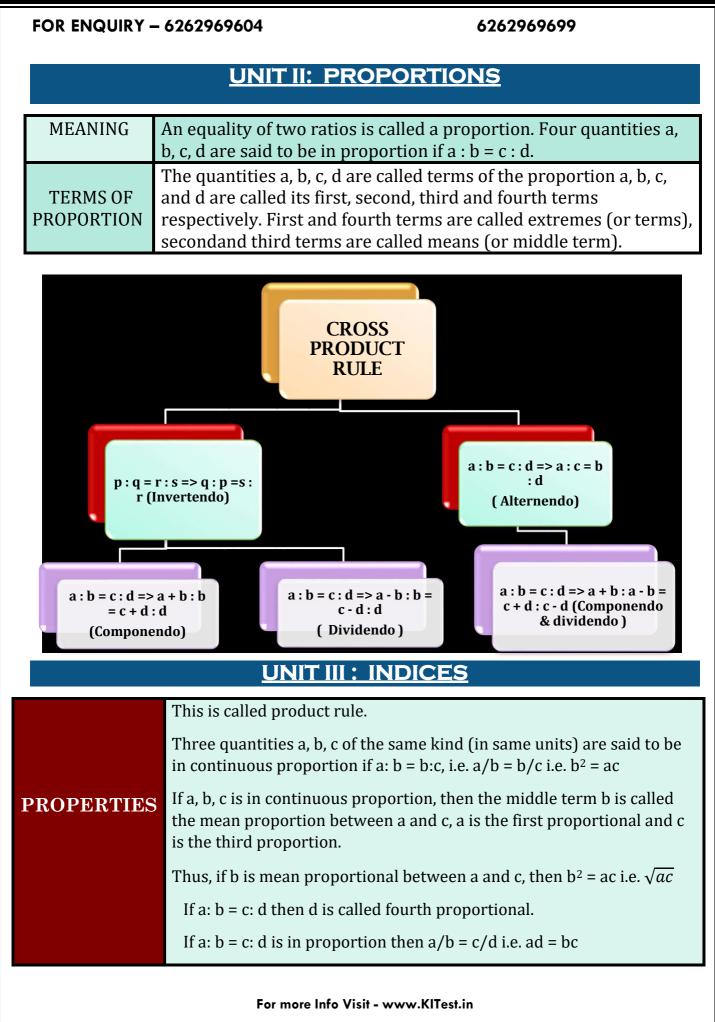
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FOR ENQUIRY - 6262969604 6262969699 CHAPTER - 1 **RATIO AND PROPORTION, INDICES, LOGARITHMS UNIT I: RATIO** TYPES OF RATIO **Continued ratio is the relation (or** A ratio compounded of **compassion**) between the magnitude of itself is called duplicate three or more Quantities of the same kind. ratio a2 : b2 is the The continued ratio of three similar duplicate ratio of a:b quantities a, b, c is written as a : b : c Continued ratio is the relation (or compassion) between the magnitudes of three or more. The sub-duplicate ratio Similarly the Quantities of the same kind. the of a : b is a : b and the triplicate ratio a : b continued ratio of three similar sub-triplicate ratio of a is a3 : b3. quantities a ,b, c is written as a : b: c : b is a 1/3: b1/3 A ratio is a comparison of the sizes of two or more If a and b are two quantities of the same kind (in same units). Then the fraction a/b is called the ratio of a to b. it is written as a: b. Thus, the ratio of a to b = a/b or a: b. The quantities a and b are called the terms RATIO of the ratio, a is called the first term or antecedent and b is called the second term or consequent

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i.e. product of extreme = product of means.

Laws and Properties.		
1.	$\underline{a^m \times a^n} = \underline{a^{m+n}}$, when m and n are positive integers (base must be same)	
2.	$am/a^n = am-n$ when m and n are positive integers and m > n	
3.	$(a^m)^n = a^{mn}$ where m and n are positive integers	
4.	$(ab)^n = a^{n} \cdot b^n$ when n can take all of the values.	
5.	a ⁰ = 1	
6.	$a^{-m} = 1/a^{m}$ and $1/a^{-m} = a^{m}$	

UNIT IV: LOGARITH

L	DGARITHM.
	•The two equations $ax = n$ and $x = \log an$ are only transformations of each other and should be remembered to change one form of the relation into the other.
	•The logarithm of 1 to any base is zero. This is because any number raised to the power zero is one.
	 Since a0 = 1, loga1 = 0 The logarithm of any quantity to the same base is unity. This is because any quantity raised to the power 1 is that quantity.
	•Since $a1 = a$, loga $a = 1$

]	FUNDAMENTAL LAWS OF LOGARITHM
1.	$\log_a mn = \log_a m + \log_a n$
2.	$\log_{a} \frac{m}{n} = \log_{a} m - \log_{a} n$
3.	$\log_a m^n = n \log_a m$
4.	log _a a = 1, a =1
5.	$\log_{a} 1 = 0$

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6.	$\log_b a \times \log_a b = 1$
7.	$\log_{b}a \times \log_{c}b = \log_{c}a$
8.	$\log_{\mathbf{b}} a = \log a / \log \mathbf{b}$
9.	$\log_{b}a = 1/\log_{a}b$



 Question 1

 Ratio between 150 gm and 2 kg

 (a) 3: 40
 (b) 3: 41

 (c) 6: 12
 (d) None of these

 Answer: A

 Explanation:

 Ratio between 150 gm and 2000 gm =150/2000 = 3/40 = 3:40

Question 2a: b = c: d, then b: a = d: c(a) Alternendo(b) Dividend(c) Invertendo(d) ComponendoAnswer: CExplanation:Invertendo properties pf proportion is a: b = c: d then b: a= d:c

Question 3

The monthly incomes of two persons are in the ratio 4:5 and their monthly expenditure are in the ratio7:9. If each save Rs. 50 per month, find their monthly incomes.

(a) 600 and 100	(b) 500 and 400
(c) 900 and 700	(d) 400 and 500
Answer: D	

Explanation:

Let the monthly incomes of oneperson be Rs. 4x and that of the other be Rs. 5x Let the monthly expenses of one person be 7y and that of other be 9y According to the question,

4x - 7y = 50(1)

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Question 4

Shivani weights 56.7 kg. If he reduces his weight in the ratio 7: 6, find his new weight.

(a) 486.96kg	(b) 48.6kg
(c) 486kg	(d) 4.86kg

Answer: B

Explanation: Original weight of Shivani = 56.7 kg He reduces his weight in the ratio 7 : 6 His new weight = $(6 \times 56.7)/7 = 6 \times 8.1 = 48.6$ kg

Ouestic	on 5

Find the value of x if $10/3$: x = $5/2$: 5	5/4
(a) 5/3	(b) 3/5
(c) 9/5	(d) 5/9
Answer: A	
Explanation:	
10/3: x = $5/2$: $5/4$	
Using cross product rule, $x \times 5/2 = (10)$	/3) × 5/4
Or, $x = (10/3) \times (5/4) \times (2/5) = 5/3$	

Question6		
Find the third proportion to 2.4 kg, 9.6 kg.		
(a) 384kg	(b) 38.4 kg	
(c) 3804kg	(d) 3.84 kg	
Answer: B		
Explanation:		

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Let the third proportion to 2.4 kg, 9.6 kg be x kg. Then 2.4 kg, 9.6 kg and x kg are in continued proportion since $b^2 = ac so, 2.4/9.6 = 9.6/x or, x = (9.6 \times 9.6)/2.4 = 38.4$

Question7

The inverse ratio of 11:15 is:

(a) 15: 11 (c) 15: 15 (b) 11: 11 (d) $\sqrt{11} : \sqrt{15}$

Answer: A Explanation:

One ratio is the inverse of another if their product is 1. Thus a: b is the inverse of b: a and vice – versa.

Question8

If a: b = c: d = e: f =, then each of these ratios is equal

(a) (a + c + e +): (b + d + f +) is equal to each ratio (c) (a + c + e +): (b + d + f +) is zero ratio **Answer: A Explanation:** Due to addendo property.

Ouestion9 If a: b = c: d = 2.5: 1.5, what are the values of ad: b c and a + c: b + d? (a) ad: b c and a +c: b + d are 2:1 and (b) ad: b c and a + c: b + d are 1: 1 and 8:3 5:3 (c) ad: b c and a + c: b + d are 1:1 and (d) None. 5:5 **Answer: B Explanation:** In the given proportion a: b and c: d, applying cross product rule, we get ad = bcDividing by bc on both sides, we get ad - = 1 bc 1 ad $\frac{1}{bc} = \frac{1}{1}$ 1 ad: bc = 1: 1 Given: a: b = c: d = 2.5: 1.5 ----- (1) In the given proportion a: b and c: d applying the property addendo, we get

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a: b = c: d = (a+b) : (c+d) ----- (2)From (1) and (2) we get (a+b) : (c+d) = 2.5: 1.5 (a+b) : (c+d) = (2.5 × 10) : (1.5 × 10) (a+b) : (c+d) = 25: 15 (a+b) : (c+d) = (25/5) : (15/5) (a+b) : (c+d) = 5: 3

Question10

Simplify $2x \frac{1}{2} 3x^{-1}$ if x = 4	
(a) 3	(b) 6
(c) 0.3	(d) 30
Answer: A	
Explanation:	
We have 2x ¹ ⁄ ₂ 3x ⁻¹	
$= 6x^{\frac{1}{2}}x^{-1} = 6x^{\frac{1}{2}-1}$	
$= 6x^{\frac{1}{2}}$	
=3	

Question11 Find the value of k form $(\sqrt{9})^{-7} \times (\sqrt{3})^{-5} = 3^{k}$ (a) 19/2 (b) 19/3 (c) -19/3(d) - 19/2**Answer: d Explanation:** $(\sqrt{9})^{-7} \times (\sqrt{3})^{-5} = 3^k$ $\Rightarrow \left\{ (3^2)^{\frac{1}{2}} \right\}^{-7} \left\{ (3)^{\frac{1}{2}} \right\}^{-5} = 3^k$ $\Rightarrow 3^{-7} \times 3^{\frac{-5}{2}} = 3^k$ $\Rightarrow 3^{-7\frac{-5}{2}} = 3^k$ $\Rightarrow 3^{\frac{-14-5}{2}} = 3^k$ $\Rightarrow 3^{\frac{-19}{2}} = 3^k$ $\Rightarrow k = \frac{-19}{2}$ **Question12** 1 - 2

$\log_2 1 - i$
(a) 0
(c) x
Answer: A

(b)	1
(d)	m

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Explanation:	
According to properties of logarithm l	$\log_a 1 = 0$
Question13	
log 6 +log 8 is expressed as (a) log 11	(b) log 48
(c) either a or b	(d) log 14
Answer: B	
Explanation:	$a \log m + \log n - \log mn$
According to properties of logarithm i	$e.,\log_a m + \log_a n = \log_a mn$
Question14	2
1	$\frac{1}{5}$ of A's amount is equal to $\frac{2}{5}$ of B's amount,
how much amount does B have?	
(a) Rs. 460 (c) Rs. 550	(b) Rs. 484 (d) Rs. 664
Answer: B	(u) N3. 004
Explanation:	
Rs484.	
The logarithm of 16 to the base 2 is eq	ual to 4
$\frac{4}{15}A = \frac{2}{5}B$	
$\Rightarrow A = \left(\frac{2}{5} \times \frac{15}{4}\right) B$	
$\rightarrow A = \frac{3}{B}B$	
$A = \frac{3}{2}B$ $A = \frac{3}{2}B$ $A = \frac{3}{2}B$	
A: B = 3: 2 $P_{12}^{2} = P_{12}^{2} = P_{$	
B's share = Rs. $[1210 \times \frac{2}{5}]$	
Question15	
boy gets Rs. 3.60 and each girl Rs. 2	100 boys and girls in such a way that the 40 the number of girls is
(a) 35	(b) 40
(c) 45	(d) 50
Answer: B	
Explanation: Step (I): Let x be the numbers of boys	and v be the number of girls.
Given total number of boys and girls =	-
X + y=100 (I)	
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Step (ii): A boy gets Rs. 3.60 and a girl gets Rs. 2.40 The amount given to 100 boys and girls = Rs. 312 3.60x + 2.40y = 312 ------ (ii)

Step (iii):
Solving (i) and (ii)
3.60x + 3.60y = 360 ------Multiply (I) by 3.60
3.60x + 2.40y = 312 ----- (ii)
1.20y = 48
Y = 48 / 1.20
= 40

Number of girls = 40

Question16

Two numbers are respectively 20% and 50% more than a third number. The ratio of the two numbers is:

(a) 2 :5	(b) 3: 5
(c) 4 :5	(d) 6 : 7
Answer: C	
Explanation:	
Let the third number be x.	
Then, first number = 120% of	$x = \frac{120x}{100} = \frac{6x}{5}$
Second number = 150% of x	100 2
Ratio of first two numbers = $\left(\frac{e}{2}\right)$	$\left(\frac{5x}{5}:\frac{3x}{2}\right) = 12x:15x = 4:5.$

Question17

Seats for mathematics, physics and biology in a school are in the ratio 5:7:8, There is a proposal to increase these seats by 40%, 50% and 75% respectively. What will be the ratio of increased seats?

(a) 2:3:4	(b) 6:7:8
(c) 6:8:9	(d) None of these
Answer: A	

Explanation:

Originally, let the number of seats for mathematics, Physics and biology be 5x, 7x and 8x respectively.

Number of increased seats are (140% of 5x), (150% of 7x) and (175% of 8x)

$$\left(\frac{140}{100} \times 5x\right), \left(\frac{150}{100} \times 7x\right) \text{ and } \left(\frac{175}{100} \times 8x\right)$$

7x, $\frac{21x}{2}$ and 14x

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:. The required ratio = 7x, $\frac{21x}{2}$: 14x $\rightarrow 14x$: 21x: 28x $\rightarrow 2$: 3: 4

Question18

A sum of money is to be distributed among A, B, C and D in the proportion of 5: 2: 4: 3. If c gets Rs. 1000 more than D, what is B's share?

(a) Rs. 500 (b) Rs. 1500 (c) Rs. 2000 (d) None of these **Answer: C Explanation:** Let the shares of A, B, C and D be Rs. 4x and RS.3X Respectively. Then, 4x - 3x = 1000 $\Rightarrow x = 1000$. $\Rightarrow B's share = Rs. 2x = Rs. (2 \times 1000) = Rs. 2000.$ $(\frac{140}{100} \times \frac{x}{5x}), (\frac{150}{100} \times \frac{x}{7x}), (\frac{175}{100} \times \frac{x}{8x})$ $7x, \frac{21x}{2}$ and 14x 14x: 21x: 28x 2:3:4

Question19

Salaries of Ravi and Sumit are in the ratio 2:3. If the salary of each is increased by Rs. 4000, the new ratio between 40: 57. What is Sumit's salary?

(a) Rs. 17,000 (b) Rs. 20,000 (c) Rs. 25,500 (d) Rs. 38,000

Answer: D

Explanation:

Let the original salaries of Ravi and Sumit be Rs. 2x and Rs. 3x respectively. Then $\frac{2x+4000}{3x+4000} = \frac{40}{57}$ $\Rightarrow 57(2x+4000) = 40(3x+4000)$

 $\Rightarrow 6x = 68,000$

 \Rightarrow 3x = 34.000

Sumit's present salary = (3x +4000) = Rs. (34000+4000) = Rs. 38,000.

Question20

(c) 21: 22

The ratio of the number of boys and girls in a college is 7:8. If the percentage increase in the number of boys and girls be 20% and 10% respectively, what will be the new ratio? (a) 8:9 (b) 17: 18

(b) 17: 18
(d) None

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Answer: C Explanation:

Their increased number is (120% of 7x) and (110% of 8x). Originally, let the number of boys and girls in the college be 7x and 8x respectively. $\left(\frac{120}{100} \times 7x\right)$ and $\left(\frac{110}{100} \times 8x\right)$ $\frac{42x}{5}$ and $\frac{44x}{5}$ The required ratio = $\left(\frac{42x}{5} \div \frac{44x}{5}\right) = 21:22$

Question21

If 0.75: x=5: 8, then x is equal to:	
(a) 1.12	(b) 1.2
(c) 1.25	(d) 1.30
Answer: B	
Explanation:	
0.75: x:: 5: 8	
$\Rightarrow \frac{0.75}{x} = \frac{5}{8}$	
x 8	
$\Rightarrow x = 0.75 \times \frac{8}{5}$	
$\Rightarrow 1.2$	

Question22

The sum of three numbers is 98. If the ratio of the first to second is 2:3 and that of the second to the third is 5:8, then the second number is:

(a) 20 (b) 30 (c) 48 **Answer: B Explanation:** Let the three parts be A, B, C, Then, A: B = 2: 3 and B: C = 5: 8 = $\left[5 \times \frac{3}{5}\right] : \left[8 \times \frac{3}{5}\right] 3: \frac{24}{5}$ \Rightarrow A: B: C = 2:3: $\frac{24}{5}$ = 10: 15: 24 \Rightarrow B = $\left[98 \times \frac{15}{49}\right]$ = 30

Question23If Rs. 782 be divided into three parts, proportional to $\frac{1}{2}:\frac{2}{3}:\frac{3}{4}$, then the firstpart is:a) Rs. 182b) Rs. 190c) Rs. 196d) Rs. 204Answer: D

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Explanation: Given ratio = $\frac{1}{2}$: $\frac{2}{3}$: $\frac{3}{4'}$ = 6:8:9 Multiplying by 12 1st part = Rs. $\left[782 \times \frac{6}{23}\right]$ = Rs.204

Question24

The salaries A, B, C are in the ratio 2:3:5. If the increments of 15%. 10% and 20% are allowed respectively in their salaries, then what will be new ratio of their salaries?

(b) 10:11:20

(d) None of these

(a) 3:3:10 (c) 23:33:60 **Answer: C Explanation:** Let A = 2k, B = 3k and C = 5k. A's new <u>115</u> of $(115 \times 100 2k) = \frac{23k}{10}$ B's new <u>110</u> of $(110 \times 100 2k) = \frac{33k}{10}$ B's new <u>110</u> of $(110 \times 100 3k) = \frac{33k}{10}$ $(\frac{110}{100} \times 100 5k) = (120 \times 100 5k) = 6K$ New $(\frac{23k}{10} : \frac{33k}{10} : 6k)$ = 23: 33: 60

Question25

If 40% of a number is equal to two-third of another number, what is the ratio of first number the second number?

(a) 2: 5 (b) 3:4 (c) 5: 3 **Answer: C Explanation:** Let 40% of A = $\frac{2}{3}$ B Then, $\frac{40A}{100} = \frac{2B}{3}$ $\Rightarrow \frac{2A}{5} = \frac{2B}{3}$ $\Rightarrow \frac{A}{B} = (\frac{2}{3} \times \frac{5}{2}) = \frac{5}{3}$ A: B = 5: 3

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Question26 The fourth proportional to 5, 8, 15 is: (a) 18 (b) 24 (c) 19 (d) 20 Answer: b Explanation: Let the fourth proportional to 5, 8, 15 be x. Then, 5:8:15: x \Rightarrow 5x = (8×15) X = $\frac{(8\times15)}{5}$ = 24 View Answer Discuss in forum workspace Report

Question27

Two number are in the ratio 3: 5. If 9 is subtracted from each, the new numbers are in the ratio 12:23. The smaller number is:

(a) 27	(b) 33
(c) 49	(d) 55
Answer: B	
Explanation:	
Let the numbers be 3x and 5x.	
Then, $\frac{3x-9}{5x-9} = \frac{12}{23}$	
\rightarrow 23(3x-9) = 12(5x-9)	
→ 9x = 99	
→ x = 11	
The smaller number = $(3 \times 11) = 33$	

Question28

In a bag, there are coins of 25 p, 10 p and 5 p in the ratio of 1:2: 3. If there is Rs. 30 in all, how many 5 p coins are there? (a) 50 (b) 100 (c) 150 (d) 200 Answer: C Explanation: Let the number of 25 p, 10 p and 5 p coins be x, 2x, 3x respectively. Then, sum of their values = Rs. $\left[\frac{25x}{100} + \frac{10x2x}{100} + \frac{5x3x}{100}\right]$ $\therefore \frac{60x}{100} = 30 \rightarrow \frac{30 \times 100}{60} = 50$ Hence, the number of 5 p coins = $(3 \times 50) = 150$

Question29

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 $a^{\text{logb-logc}}$. $b^{\text{logc-loga}}$. $c^{loga-logb}$ has a value of (a) 1 (b) 0(d) None (c) -1 **Answer: A Explanation:** $Let x = a^{logb-logc} \cdot b^{logc-loga} \cdot c^{loga-logb}$ Taking log both the sides, we get $\log x = \log (a^{\log b - \log c} \cdot b^{\log c - \log a} \cdot c^{\log a - \log b})$ $= \log a^{\log b - \log c} + \log b^{\log c - \log a} + \log c^{\log a - \log b}$ = (logb - logc) loga + (logc - loga) logb + (loga - logb) logc= 0 Log x = 0 \Rightarrow x = e^0 $\Rightarrow 1$

Question30 If loga = $\frac{1}{2}$ logb = $\frac{1}{5}$ logc, the value of $a^4 b^3 c^{-2}$ is (a) 1 (b) 0(c) -1 (d) None **Answer: A Explanation**: Let $\log a = \frac{1}{2} \log b = \frac{1}{5} \log c = k$ Then $\log a = k \rightarrow a = e^k$ $\frac{1}{2}$ logb = k \rightarrow logb = 2k \rightarrow b = e^{2k} $\frac{1}{5}\log c = k \rightarrow \log c = 5k$ \rightarrow c = e^{5k} $a^4b^3c^{-2} = e^{4k}, e^{6k}, e^{-10k}$ $= e^0 = 1$

Question31

The ratio of market prices of wheat and paddy is 2:3 and the ratio of quantities consumed in a family is 5:4. Find the ratio expenditure of wheat and paddy.

(a) 6:5	(b) 5:6
(c) 1:1	(d) 8:15
Answer: B	
Explanation:	
Expenditure = Price × Quantity	

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 $\frac{Wheat \ price}{paddy \ price} = \frac{2}{3} \text{ and } \frac{Wheat \ quantity \ consumed}{paddy \ quantity \ consumed} = \frac{5}{4}$ Multiplying both ratios
Wheat price × Wheat quantity consumed = 2×5
Paddy price × paddy quantity consumed = 3×4 $\frac{Wheat \ Expenditure}{paddy \ Expenditure} = \frac{5}{6}$

Question32If A: B = 2:3, B:C = 4:5 and C: D = 6:7, then find the value of A: B:C:D(a) 15:24:30:35(b) 16:24:30:35(c) 17:24:30:35(d) 18:24:30:35Answer: BExplanation:Given a: b = 2: 3, b: c = 4: 5, c: d = 6: 7a: b = 2 × 8: 3 × 8 = 16: 24b: c = 4 × 6: 5 × 6 = 24: 30c: d = 6 × 5: 7 × 5 = 30: 35So, a: b: c: d = 16: 24: 30: 35

Question 33The value of log_2 ($log_5 625$) is:(a) 2(b) 5(c) 10(d) 15Answer: AExplanation:Let $log_5 625 = x$.Then. $5^x = 625 = 5^4$ or x = 4Let $log_2 4 = y$ or $2y = 4 = 2^2$ or y = 2Log_2 ($log_5 625$) = 2

Question34

In a library, he ratio of number of story books to that of non - story books was 4:3 and total number of story books was 1248. When some more story books were bought, the ratio became 5:3. Find the number of story books bought. (a) 312 (b) 321 (c) 936 (d) 1560 Answer: A

Answer: A Explanation: Given

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The total number of story books in a library is 1248 when the ratio of the number of story books of that of non-story books was 4:3

To find:

The number of story books bought.

Solution:

The given ratio of the number of story books to that of non-story books was 4 : 3 when the total number of story books in a library is 1248.

Let 4x be the total number of storybooks.

$$\Rightarrow 4x = 1248$$
$$\Rightarrow X = \frac{1248}{4} = 312$$

The number of non-story books = $3x = 3 \times 312 = 936$ When some more story books were bought the ratio becomes 5 : 3 Let y no of storybooks added to the library

$$\Rightarrow \frac{(1248+y)}{936} = \frac{5}{3}$$
$$\Rightarrow 1248+y = \frac{(5\times936)}{3}$$
$$\Rightarrow 1248+y = 1560$$
$$\Rightarrow Y = 1560 - 1248$$
$$\Rightarrow Y = 312$$

 \div 312 more books were bought and added to the library.

Question35

Log144 is equal to:

(a) $2\log 4 + 2\log 2$ (c) $3\log 2 + 4\log 3$ **Answer: B Explanation:** $\log 144$ $\log (2^4 \times 3^2)$ $\log 2^4 + \log 3^2$ $4\log 2 + 2\log 3$ (b) 4 log 2 + 2log3 (d) 3 log2 × 4log3

Question36	
Price of each article of	type P, Q AND R is Rs. 300, Rs. 180 and Rs. 12
Respectively. Suresh b	uys articles of each type in the ratio 3:2:3 in Rs. 6480.
How many articles of t	ype Q did he purchase?
(a) 8	(b) 14
(c) 20	(d) None of the above
Answer: A	
Explanation:	

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Let the common factor be k. Hence, the number of articles of type P, Q and R will be 3k,2k and 3k respectively Also, Unit price of article x Number of articles = Total amount for the articles $300 \times 3k + 180 \times 2k + 120 \times 3k = 6480$ K = 4

Number of articles of type Q = 2k = 8

Question37

Ajay and Raj together have Rs. 1050. On taking Rs. 150 from Ajay will have same amount as what Raj had earlier. Find the ratio of amounts with Ajay and Raj initially.

(a) 3:4 (b) 7:1 (d) 4:3(c) 1:3 **Answer: D Explanation**: Let initially money with Ajay be A and with Raj be R So, A+R = 1050(1) Also, money is taken from Ajay, so A - 150 = RA-R = 150(2) Adding both equations 2A = 1200A = Rs. 600 = Initial money with AjayR = 1050 - 600 = Rs. 450 = Initial money with Raj $\frac{\text{Amount with Ajay}}{\text{Amount with Raj}} = \frac{600}{450} = \frac{4}{3}$

Question38

The three numbers are in the ratio $\frac{1}{2}$: $\frac{2}{3}$: $\frac{3}{4}$. The difference between greatest and smallest numbers is 36. Find the numbers. (a) 72, 84, 108 (b) 60, 72, 96 (c) 72, 84, 96 (d) 72,96, 108 Answer: A Explanation: Let the common factor be k So the three numbers are $\frac{k}{2}$, $\frac{2k}{3}$, $\frac{3k}{4}$ Also, we know that, greatest – smallest = 36

 $\frac{3k}{4} - \frac{k}{2} = 36$

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K = 144 The numbers are $\frac{k}{2} = \frac{144}{2} = 72$ $\frac{2k}{2} = \frac{2 \times 144}{2} = 84 : \frac{3k}{4} = \frac{3 \times 144}{4} = 108$

 Question 39

 If $log_3y = 100$ and $log_3x = 10$, then the value of y is:

 (a) 3^{10} (b) 3^{100}

 (c) 3^{1000} (d) 3^{10000}

 Answer:C

 Explanation:

 $Log_3x = 10$

 Hence, $x = 3^{10}$
 $Log_x y = 100$
 $y = x^{100} = (3^{100}) = y = 3^{1000}$

Question40The third proportional between $a^2 - b^2$ and $(a + b)^2$ is $(a) \frac{a+b}{a-b}$ $(b) \frac{a-b}{a+b}$ $(c) \frac{(a+b)^3}{a-b}$ $(d) \frac{(a+b)^3}{(a-b)^3}$ Answer: C

Explanation:

Let x be required third proportional, then $(a^2 - b^2):(a + b)^2::(a + b)^2: x$ $\Rightarrow \frac{a^2 - b^2}{(a+b)^2} = \frac{(a+b)^2}{x}$ $\Rightarrow x(a^2 - b^2) = (a + b)^4$ i.e. $x(a - b)(a + b) = (a + b)^4$ $\Rightarrow x = \frac{(a+b)^3}{a-b}$

Question41

A sum of Rs. 53 is divided in such a way that A gets Rs. 7 more than what b gets and b gets Rs. 8 more than what C gets. The ratio of their share is. (a) 25:18:10 (b) 25:18:1 (c) 2:18:10 (d) 25:8:10 Answer: A Explanation: Let the share of c = Rs. X.

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Then share of B = Rs. (x+8) and share of A = Rs. (x + 8 +7) Therefore x + (x+8) + (x+15) = 53 \rightarrow 3x = 30 i.e. x = 10 Hence ratio A: B: C = 25:18: 10

Question42

Fourth	pro	portion	to 4,	6,8	B is:
I UMI CII			•••••	v , ·	

(a) 12 (c) 48 (b) 32 (d) None

Answer: A

Explanation: Let x be the required fourth proportional. Then 4,6,8, x are in proportion. 4: 6:: 8:x or 4/6, 8/x = 4x = 48X = 12

Question43

The mean proportion between 64 and 81 is

(a) 72 b) 62 (c) 48 d) None **Answer: A**

Explanation:

Let x be the mean proportional then 64:x:: x: 81

 $\Rightarrow \frac{64}{x} = \frac{x}{81}$ $\Rightarrow x^2 = 5184$ $\Rightarrow x = 72$

Question44

The ratio of numbers of girls and boys participating in sports of a school is 4:5. If the number of girls is 212, determine the number of boys participating in the sports.

(a) 256	(b) 265		
(c) 251	(d) 263		
Answer: b			
Explanation:			
Let the number of girls 4x			
But number of girls 212			
So,			
4x = 212			
$\mathbf{X} = \frac{212}{4}$			
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$x = 53 \dots (1)$ number of boys = 5x put the value of x = 5 × 53 = 265		
<u>Question45</u> Income ratio of Ramesh and Suresh is 5:6. Their spending ratio is 7:9, Ramesh saves 4000 and Suresh saves 3000. Income and spending respectively of Ramesh and Suresh are		
(a) Ramesh – 25000, 21000, Suresh – 30000, 27000	(b) Ramesh – 36000, 32000; Suresh - 30000,27000	
(c) Ramesh – 30000, 27000;	(d) None of the above	
(c) Ramesh = 30000, 27000; (d) None of the above Answer: A Explanation: Income ratio = Ramesh: Suresh = $5:6 = \frac{5}{6}$; Common factor helps in finding actual values easily So, Take 'A' as common factor Income of Ramesh = $5A$: Income of Suresh = $6A$ Spending of ramesh spending of Suresh = Ramesh income $\frac{7}{9}$ $\frac{5A - 4000}{6A - 3000} = \frac{7}{9}$ 9(5A - 4000) = 7(6A - 3000) A = 5000 Income of Ramesh = $5A = 25000$; Income of Suresh = $6A = 30000$ Spending of Ramesh = $25000 - 4000 = 21000$ Spending of Suresh = $30000 - 3000 = 27000$ Ramesh - $25000, 21000$; Suresh - $30000, 27000$		
	9; C:D = 5:7 b) 105:115:236: 189 d) 12:78:256: 189	
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d = 9 e = 5 f = 7 A: B:C:D = [2 × 7 × 5]: [3 × 9 × 5]: [3 × 9 × 7] A: B: C: D = 70:105:135:189

Question47

Find the mean proportional between 7 and 63?

(a) 35 (b) 21 (c) 27 (d) 30 Answer: B Explanation: In a : b: c, mean proportion = b a: b : c can be written as a : b :: b : c a : b :: b : c = $\frac{a}{b} = \frac{b}{c} = b^2 = ac$ Here, a = 7; c = 63 b = $\sqrt{7 \times 63} = 21$

Question48

It was intended that Rs. 585 be divided among P, Q and R in the ratio of 4:3:2, but by mistake the distribution was made in the proportion of 1/4: 1/3: 1/2. How much does 'R' gain by the error?

(a) Rs. 99 (b) Rs. 126 (c) Rs. 140 (d) Rs. 152 **Answer: C Explanation**: Total amount = Rs. 585 On dividing it in the ratio of 4:3: 2 Share of P = 4/9 * 585 = Rs. 260Share of Q = 3/9 * 585 = Rs. 195Share of R = 2/9 * 585 = Rs. 130But the amount has been divided in the proportion of 1/4: 1/3: 1/2 i.e. 3: 4: 6 Share of $P = 3/13^* 585 = Rs. 135$ Share of $Q = 4/13^* 585 = Rs. 180$ Share of $R = 6/13^* 585 = Rs. 270$ Therefore, gain for R By Virtue of error = Rs. 270 – Rs. 130 = Rs. 140

Question49

By giving Rs. 50 to M, A would have the amount equal to what M had earlier. If the sum of the amounts with A and M is Rs. 650. What is the ratio of the amount with A to that with M earlier?

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(a) 7 : 4 (c) 2 : 1 Answer: D	(b) 5 : 3 (d) 7 : 6
Explanation: Let the amounts with A and M be Rs. " Thus, we have, $x + y = 650$ X - 50 = y X - y = 50.	'x" and Rs. "y" respectively.
x - y = 50. Hence, x = 350 & y = 300 Thus the required ratio is 350: 300 = 2	7:6
200. The unit prices of the articles a respectively. If she spends the entir	ree articles A, B and C from a sum of Rs. A, B and C are Rs.20 Rs. 35 and Rs. 25 re amount by purchasing 5 numbers of of the number of articles purchased of type
(a) 1 : 2	(b) 2 : 1
(c) 1:1	(d) None of these
Answer: B	
Explanation: After spending Rs. 125 (25 *5) for arti 75(200-125). Since this amount has to purchased 2 articles of type A equival (equivalent to Rs. 35) Thus, the requir	ent to Rs. 40) and 1 article of type B
<u>Question51</u>	
In what ratio should the profit be d 2:3:5 and their timing of their inves	
(a) 8:15:30 (c) 4:5:6	(b) 5:18:28 (d) 2:3:5
Answer: A	(u) 2.3.3
Explanation:	
P1:P2: P3 = (2*4): (3*5): (5*6) = 8:15: 30	
Question52	l a commercial space costs Rs. 9500 per sq.
	eas if the total cost of both are the same?
(a) 9:19	(b) 19:9
(c) 15:28 Answer: B	(d) 28:15
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Explanation:

Let A1 be the area of flat and A2 be that of the commercial space Total cost = area * rate Therefore, cost of flat = A1*4500; cost of commercial space = A2*9500 Both the above costs are same A1*4500 = A2*9500 A1:A2 = 9500:4500 = 19:9

Question53

In what ratio should the profit of Rs. 8000 be divided if x starts a business with an investment of Rs. 20000, y invests Rs. 7500 for 4 months and z invests Rs. 15000 after 3 months from the start of the business?

Answer: C

Explanation:

Let the profit of x be P1, that of Y be P2 and of Z be P3. P1:P2: P3 = 20000*12: 7500*4: 15000*9 = 240: 30: 135 = 80: 10: 45 = 16: 2: 9

Question54The third proportional to $x^2 \cdot y^2$, $x \cdot y$ is?(a) x + y(b) x - y(c) x - y/(x + y)(d) 1Answer: CExplanation:A simple problem involving geometric progression (G.P)In each term, a term of (x + y) is divided.

Hence the third term becomes x-y/(x + y)

Question55

If the ratio of present ages of jeet and jay is 5:7 and after 6 years the ratio will be 3:4, what is the present age of jay?

(a) 42 (c) 36 (b) 30(d) None of these

Answer: A

Explanation:

As the present age of jeet and jay are in the ratio 5: 7, let their ages be 5x and 7x respectively.

Therefore, their ages after 6 years will be (5x + 6) and (7x + 6) respectively.

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Now, it is given that $\frac{(5x+6)}{(7x+6)} = \frac{3}{4}$ $4 \times (5x+6) = 3 \times (7x+6)$ 20x + 24 = 21x + 18 $\Rightarrow 6 = x$ $\Rightarrow x = 6$ Present age of jay = $7x = 7 \times 6 = 42$

Question56

 What is the fourth proportional to the numbers 2, 5, 8?

 (a) 40
 (b) 20

 (c) 15
 (d) 10

 Answer: B

 Explanation:

 2/5 = 8/x: x = 40/2 = 20

Question57

The ratio between the speeds of two trains is 7:8. If the second train runs 400kms. In 5 hours, the speed of the first train is:

(a) 10 km/hr.(c) 70 km/hr.

(b) 50 km/hr.(d) None of these

Answer: C

Explanation: Speed = Distance/Time

2ND train: speed = 400 / 5 = 80 km/hr. 1st train speed = (80/8) ×7 km/hr. = 70 km/hr.

Question58

If $(5x-3y)/(5y-3x) = \frac{3}{4}$, the value of x: yis: (a) 2:9 (b) 7:2 (c) 27:29 (d) none of these Answer: C Explanation: $(5x - 3y) / (5y - 3x) = \frac{3}{4}$ Cross multiplying the numbers in the left and right, 4 (5x - 3y) = 3 (5y - 3x)

Opening the brackets, 20x - 12y = 15y - 9xGrouping like terms to one side, 20x + 9x = 15y + 12y

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29x = 27y \rightarrow 29* x = 27 * y \rightarrow X/y = 27 / 29 →X: y = 27:29 **Ouestion59** A number consist of three digits of which the middle one is zero and the sum of the other digit is 9. The number formed by interchanging the first and third digit is more than the original number by 297. Find the number: (b) 306 (a) 405 (d) 103 (c) 504 **Answer: B Explanation**: Let "x0y" be the required three-digit number. (As per the given information, middle digit is zero) "The sum of the other digits is 9" $\rightarrow x + y = 9 \rightarrow (1)$ "Interchanging the first and third digits " ----->y0x From the information given in the question we can have Y0x - x0y = 207(100y + x) - (100x + y) = 297100y + x - 100x - y = 297-99x + 99y = 297-x + y = 3 - ... (2)Solving (1) & (2), we get x = 3 and y = 6So, X0v = 306Hence the required number is 306. **Question60** Show that $\left(\frac{x^a}{x^b}\right)^{1/ab} \times \left(\frac{x^b}{x^c}\right)^{1/bc \times (\frac{x^c}{x^a})^{1/ca}}$ reduce to: (a) 1 (b) 3 (d) 2(c) 0Answer: A **Explanation:** $\left(\frac{x^a}{x^b}\right)^{1/ab} \times \left(\frac{x^b}{x^c}\right)^{1/bc} \times \left(\frac{x^c}{x^a}\right)^{1/ca}$ $\frac{x^{a} \times \frac{1}{ab}}{x^{b} \times \frac{1}{ab}} \times \frac{x^{b} \times \frac{1}{bc}}{x^{c} \times \frac{1}{bc}} \times \frac{x^{c} \times \frac{1}{ca}}{x^{a} \times \frac{1}{ca}}$ $\frac{x_{\overline{b}}^{1}}{x_{\overline{c}}^{1}} \times \frac{x_{\overline{c}}^{1}}{x_{\overline{b}}^{1}} \times \frac{x_{\overline{c}}^{1}}{x_{\overline{c}}^{1}}$ For more Info Visit - www.KITest.in join our telegram channel @Ca foundation quiz group 1.25

FOR ENQUIRY - 6262969604 6262969699 = 1 **Question61** If $5 = \sqrt{x + \sqrt{x + +\sqrt{x + + +\sqrt{x + +1} + +\x + + +\x + +$ (b) 20 (a)10 (c) 5 (d) ∞ **Answer: B Explanation:** $5 = \sqrt{x + \sqrt{5}}$ $5 = \sqrt{x+5}$ 25 = x + 525-5 X = 20**Ouestion62** $\frac{1}{\log a/b^{(x)}} + \frac{1}{\log b/c^{(x)}} + \frac{1}{\log c/a^{(x)}}$ is equal to: (a) 0 (b) 1 (c) 3 (d) -1 **Answer: B Explanation**: By the Circular motion $\frac{1}{\log a/b^{(x)}} + \frac{1}{\log b/c^{(x)}} + \frac{1}{\log c/a^{(x)}} = 1$ **<u>Question6</u>**3 If $\log_x y = 100$ and $\log_z x = 10$ then the value of y: (b) 2¹⁰⁰ (a) 2¹⁰ (d) 2^{10000} (c) 2¹⁰⁰⁰ **Answer: C Explanation:** $\log_z x = 10 \rightarrow \log_2 x = 10$ $\log_{x} y = 100$ $Y = x^{100}$ $Y = (2^{10})^{100}$ (put value of x) $Y = 2^{1000}$ **Question** 64 A computer software company wishes to start the production of floppy disks.

A computer software company wishes to start the production of floppy disks. It was observed that the company had to spend a Rs. 2 lakhs for the technical information's. The costs of setting up the machine is Rs. 88,000 and the cost For more Info Visit - www.KITest.in

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of producing each unit is Rs. 30, while each floppy could be sold at Rs. 45. Find:		
(i) The total cost function for produ	cing x floppies; and	
(ii) The break - even point (a) C(x) = 45x +200000, 198000	(b) C(x) = 30x+200000,19200	
(c) C(x) = 30x + 288000, 19200 Answer: C	(d) None of these	
Explanation: (i) Cost of floppy + cost on technical in 30x+200000+88000 30x+288000	formation + Cost of setting up	
(ii) By the option Method 45= 864000 = 19200		
30+288000, 19200 So, if the owner sells 19200 units of flo	oppy, then only, he will be on BEP	
	is in the ratio 11:7. X and y would get	
Rupees: (a) (208,120)	(b) (200,124)	
(c) (180,144)	(d) (198,126)	
Answer: D Explanation:		
Ratio of division is 11:7 so,		
X share = 11a and y is 7a		
Total 11a + 7a = 18a 18a = 324		
a = 18		
x share = 11a = Rs. 198 y share = 7a = Rs. 126		
<u>Question66</u>		
If $\frac{a}{4} = \frac{b}{5}$ then:		
(a) $\frac{a+4}{a-4} = \frac{b+4}{b-4}$	(b) $\frac{a+4}{a-4} = \frac{b+5}{b-5}$	
(a) $\frac{a-4}{a-4} = \frac{b-4}{b-5}$ (c) $\frac{a-4}{a+4} = \frac{b+5}{b-5}$	(b) $a-4 = b-5$ (d) None of these	
$\frac{(C)}{a+4} - \frac{1}{b-5}$ Answer: B		
Explanation:		
By ComponendoDividendo: -		
a /4 = b/5 => a/4 +1 => (a + 4) / (b + 5 a/4 = b/5 => a/4 - 1= b/5 - 1 => (a - 4		
a/4 = 0/5 = 2 a/4 = 1 = 0/5 = 1 = 2 (a = 4)/ (b = 5) = 4/5 For more Info Visit - www.KITest.in		
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<i>a</i> +	4	_ b	+	5
<i>a</i> –	4	\overline{b}) —	5

PREPARE FOR WORST

Question 1	
$\overline{(1331)^{-(2/3)}}$ B	a. 11
(a) $-\frac{1}{11}$ (c) $-\frac{1}{121}$	(b) $-\frac{11}{121}$ (d) $-\frac{121}{11}$
(c) $-\frac{1}{121}$	(d) $-\frac{1}{11}$
Question 2	
$(32)^{(n/5)} \times 2^{2n+}$	
	(b) 8
(c) 2^n	(d) 2^{n+1}
Question 3	
[;'[-" (a) 122	(b) 177
(a) 132 (c) 185	(d) 225
Question 4 If $2 \times 8^{(1/4)} = 2^{(1/4)}$ then find the value of x	
(a) $-\frac{1}{2}$	$(b)^{\frac{1}{2}}$
$(c) \frac{1}{4}^{2}$	(b) $\frac{1}{2}$ (d) $-\frac{1}{4}$
4	4
Question 5	
If $9^x - 9^{x-1} = 648$, then find the value of x^x (a) 4	(b) 9
(c) 27	(d) 64
Ouestion 6	
If $4^{(x-y)} = 64$ and $4^{(x+y)} = 1024$, then find the value	alue of x.
(a) 3	(b) 1
(c) 6	(d) 4
Question 7	
If a and b are whole numbers such that $a^b = 12$	
(a) 0 (c) 10 ²	(b) 10 (d) 10 ³
	(u) 10
Question 8	
log ₂ 64 (a) 6	(b) 8
(c) 16	(d) 32
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Question 9	
$log_7\left[\frac{1}{2401}\right]$	
(a) 7	(b) -3 (d) 9
(c) -4	(u) 5
Question 10 49log ₇ 4	
(a) 7	(b) 14 (d) 19
(c) 16	(d) 18
$\frac{\text{Question 11}}{\text{Simplify}\left[\frac{1}{\log_{ab}(abc)} + \frac{1}{\log_{bc}(abc)} + \frac{1}{\log_{ac}(abc)}\right]}$	
(a) 0 $\log_{ab}(abc) + \log_{bc}(abc) + \log_{ac}(abc)$	(b) 1
(c) 2	(d) abc
Question 12	
Simplify: $log_4 3 \times log_{243} 64$ (a) 3/5	(b) 2/5
(c) 3/4	(d) 1/3
Question 13	
If $x^a = y^b$ then (a) $\frac{\log x}{\log y} = \frac{a}{y}$	(b) $\frac{\log x}{\log y} = \frac{b}{a}$
	(d) None of these
Question 14	
	expression $[\log 10 \ 2 + \log (4x + 1) = \log (x + 2) + \log (2x + 1)]$
1] (a) 6	(b) 7
(c) -6	(d) -9
<u>Question 15</u> A bag contains 50 P, 25 P and 10 P coins in the ratio 5: 9: 4, amounting to Rs. 206. Find the number of coins of each type respectively	
<u>Question 16</u> Two numbers are respectively 20% and 50% more than a third number. The ratio of the two numbers is:	
<u>Question 17</u> Salaries of Ravi and Sumit are in the ratio 2:3. If the salary of each is increased by Rs. 4000, the new ratio becomes 40:57. What is Sumit's salary?	
Question 18	
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A sum of Rs.312 was divided among 100 boys and girls in such a way that the boy gets Rs.3.60 and each girl Rs. 2.40 the number of girls is:

Question 19

If Rs. 782 be divided into three parts, proportional to 12:23:3412:23:34, then the first part is?

Question 20

A mixture contains alcohol and water in the ratio 4 : 3. If 5 liters of water is added to the mixture, the ratio becomes 4: 5. Find the quantity of alcohol in the given mixture

Question 21 The compounded ratio of (2: 3), (6: 11) and (11:2) is

<u>Question 22</u> If 0.75: x:: 5:8, then x is equal to:

Question 23 The third proportional to x²-y² and x-y is:

Question 24

Seats for Mathematics, Physics and Biology in a school are in the ratio 5:7:8. There is a proposal to increase these seats by 40%, 50% and 75% respectively. What will be the ratio of increased seats?

<u>Question 25</u> A sum of Rs. 427 is to be divided among A, B and C such that 3 times A's share, 4 tunes B's share and 7 times C's share are all equal. The share of C is:

Question 26 If 76 are divided into four parts proportional to 7, 5, 3, 4, then the smallest part is:

Question 27 Alloy A contains 40% gold and 60% silver. Alloy B contains 35% gold and 40% silver and 25% copper. Alloys A and B are mixed in the ratio of 1:4. What is the ratio of gold and silver in the newly formed alloy is?

Question 28

If the ratio of the ages of two friends A and B is in the ratio 3: 5 and that of B and C is 3: 5 and the sum of their ages is 147, then how old is B?

Question 29

The concentration of petrol in three different mixtures (petrol and kerosene) is 1/2, 3/5 and 4/5 respectively. If 2 litres, 3 litres and 1 litre are taken from these three different vessels and mixed. What is the ratio of petrol and kerosene in the new mixture?

Question 30

The wages of labourers in a factory increases in the ratio 22:25 and there was a reduction in

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the number of labourers in the ratio 15:11. Find the original wage bill if the present bill is Rs. 5000?

Question 31

Vinod have 20 rupees. He bought 1, 2, 5 rupee stamps. They are different in numbers by the reason of no change; the shop keeper gives 3 one rupee stamps. So how many stamps Vinod have?

Question 32

A and B invests Rs.8000 and Rs.9000 in a business. After 4 months, A withdraws half of his capital and 2 months later, B withdraws one-third of his capital. In what ratio should they share the profits at the end of the year?

Question 33

The incomes of two persons A and B are in the ratio 3: 4. If each saves Rs.100 per month, the ratio of their expenditures is Rs. 1: 2. Find their incomes.

Question 34

Three cats are roaming in a zoo in such a way that when cat A takes 5 steps, B takes 6 steps and C takes 7 steps. But the 6 steps of A are equal to the 7 steps of B and 8 steps of C. what is the ratio of their speeds?

Question 35

In a competitive exam, the number of passed students was four times the number of failed students. If there had been 35 fewer appeared students and 9 more had failed, the ratio of passed and failed students would have been 2: 1, then the total number of students appeared for the exam?

Question 36

In MaaYatri Temple every devotee offers fruits to the orphans. Thus every orphan receives bananas, oranges and grapes in the ratio of 3:2:7 in terms of dozens. But the weight of a grape is 24 gm and weight of a banana and an orange are in the ratio of 4:5, while the weight of an orange is 150gm. Find the ratio of all the three fruits in terms of weight, that an orphan gets

Question 37

In a class of 39 students the ratio of boys and girls is 2: 1. Radhika ranks 15th among all the students from top and 8th among girls from bottom. How many boys are there below Radhika?

Question 38

The ratio of students in a coaching preparing for B. tech and MBA is 4: 5. The ratio of fees collected from each of B. tech and MBA students is 25: 16. If the total amount collected from all the students is 1.62 lakh, what is the total amount collected from only MBA aspirants?

Question 39

Two solutions have milk & water in the ratio 7:5 and 6:11. Find the proportion in which these two solutions should be mixed so that the resulting solution has 1 part milk and 2 parts waters?

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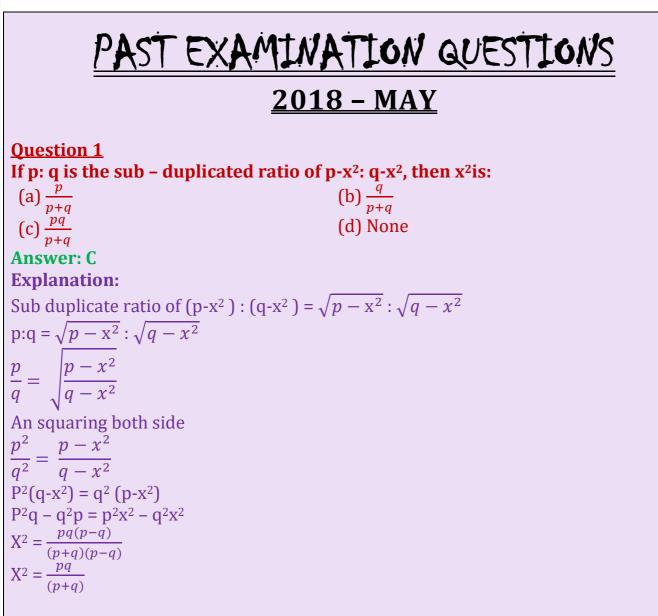
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Question 40

The ratio of the angles of a triangle is 3: 4: 5. The three angles of a quadrilateral is equal to three angles of this triangle. What is the sum of the largest angle and second smallest angle of the quadrilateral?

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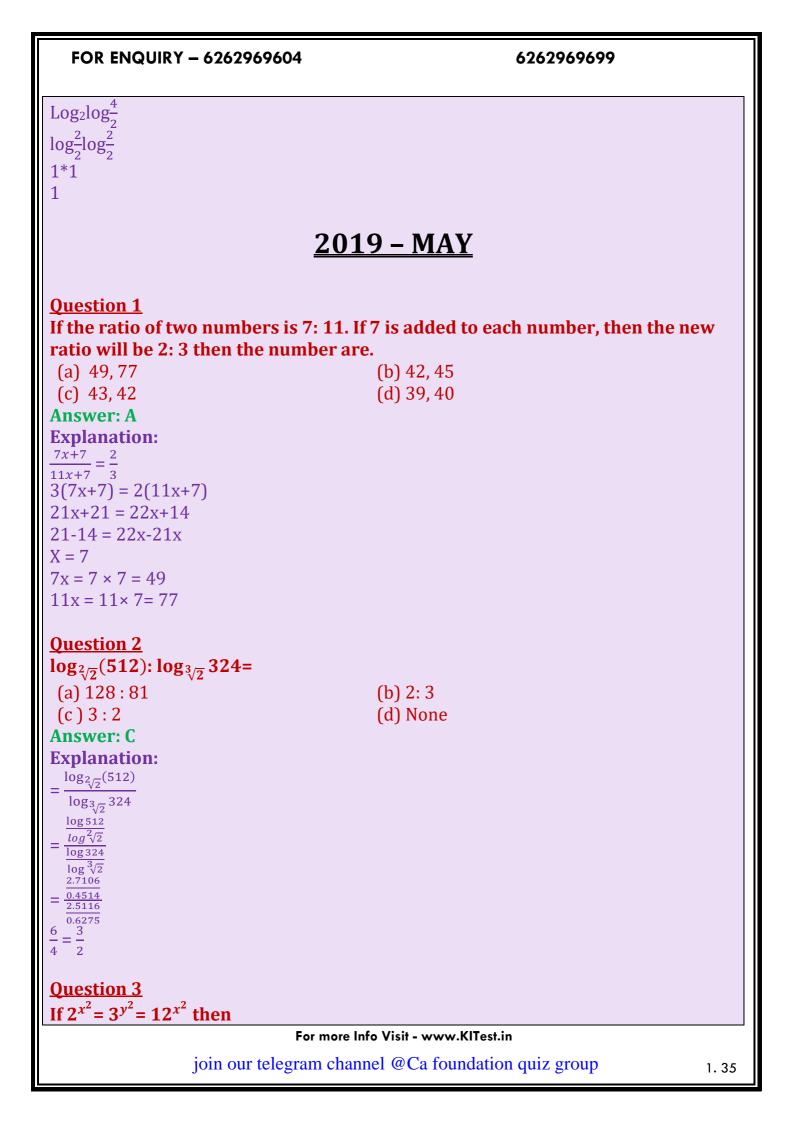


Question 2 The value of the expression:

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$a^{log_a^b.log_b^c.log_c^d.log_d^t}$	
(a) t (c) (a+b+c+d+t)	(b) abcdt (d) None
Answer: A	
Explanation: $a^{log_a^b.log_b^c.log_c^d.log_d^t}$	
$a\frac{\log^{b}}{\log^{a}} \cdot \frac{\log^{c}}{\log^{b}} \cdot \frac{\log^{t}}{\log^{d}} \cdot \frac{\log^{d}}{\log^{c}}$	
$a\frac{\log^{t}}{\log^{a}}$	
a log_a^{ι}	
= t	
<u>Question3</u> The mean proportional between 24a	nd 54 is:
(a) 33	(b) 34
(c) 35 Answer: D	(d) 36
Explanation:	
$b^{2} = ac$ $b^{2} = 24 \times 54$	
$b = \sqrt{1296}$ b = 36	
$2^{n+1} - 2^n$	(L) ³
$\frac{2^{n}+2^{n}-1}{2^{n+1}-2^{n}}$ (a) $\frac{1}{2}$ (c) $\frac{2}{3}$ Answer: B	(b) $\frac{3}{2}$ (d) $\frac{1}{3}$
Answer: B	
Explanation: $2^{n}+2^{n-1}$ $2^{n}+2^{n}\cdot2^{-1}$	
$\frac{\frac{2^{n}+2^{n-1}}{2^{n+1}-2^{n}}}{2^{n}+(1+2^{-1})} = \frac{\frac{2^{n}+2^{n}\cdot2^{-1}}{2^{n}\cdot2^{+1}-2^{n}}}{2^{n}\cdot2^{-1}}$	
$\frac{\frac{2^n + (1 + 2^{-1})}{2^n \cdot (2 - 1)}}{2^n \cdot (2 - 1)}$	
$\frac{\left(1+\frac{1}{2}\right)}{1-\frac{1}{2}}$	
1 $\frac{3}{2}$ 1	
$\frac{2}{1}$	
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$=\frac{3}{2}$	
	<u> 2018 – NOV</u>
$\frac{\text{Question 5}}{3^{N-2}}$	
$\frac{3X-2}{5X++6}$ is the duplicate ratio of $\frac{2}{3}$	
(a) 2 (c) 5	(b) 6 (d) 9
Answer: B	(u) >
Explanation:	
$\frac{3X-2}{5X+6}$ is the duplicate ratio of $\frac{2}{3}$	
i.e., $\frac{3X-2}{5X+6} = \frac{2^2}{3^2}$	
$\frac{3X-2}{5X+6} = \frac{4}{9}$	
27x-18 = 20x+24	
27x-20x = 24+18 7x = 42	
X = 6	
Question 6	
If x: y: z = 7:4:11 then $\frac{x+y+z}{z}$ is:	
(a) 2	(b) 4
(c) 3	(d) 5
Answer: A Explanation:	
If x: y: $z = 7:4:11$	
Let $x=7k$, $y=4k$, $z=11k$	
$\frac{x+y+z}{z} = \frac{7k+4k+11k}{11k} = \frac{22k}{11k} = 2$	
Question 7	
$\log_2 \log_2 \log_2 16 = ?$	
(a) 0	(b) 3 (d) 2
(c) 1 Answer: C	(d) 2
Explanation:	
$\log_2 \log_2 \log_2 16$	
$Log_2log_2\left(log\frac{2^4}{2}\right)$ $Log_2log\frac{4}{2}log\frac{2}{2}$	
$Log_2log_2^{-}log_2^{-}$	
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(a) $\frac{1}{x^2} + \frac{1}{y^2} = \frac{1}{z^2}$ (c) $\frac{2}{x^2} + \frac{1}{y^2} = \frac{1}{z^2}$ Answer: C Explanation: $2x^2 = k$ $\log 2x^2 = \log k$ $x^2 = \frac{\log k}{\log 2}$, $y^2 = \frac{\log k}{\log 3}$, $z^2 = \frac{\log k}{\log 12}$ $\frac{2}{x^2} + \frac{1}{y^2} = \frac{1}{z^2}$	(b) $\frac{1}{x^2} + \frac{2}{y^2} = \frac{1}{z^2}$ (d) None	
Question 4 Then value of $\log_5[1 + \frac{1}{5}]$ ++ lo	$0 \pi [1 + \frac{1}{2}] =$	
(a) 2 (c) 5 Answer: B Explanation: $log_5^{\frac{6}{5}} + log_5^{\frac{7}{6}} + log_5^{\frac{8}{7}} \dots log_5^{\frac{625}{624}}$ $log_5^a + log_5^b + log_5^c = log_s (a.b.c.d)$ $\Rightarrow log_5 = (\frac{6}{5} \times \frac{7}{6} \times \frac{8}{7} \times \frac{625}{624})$ $\Rightarrow log_5(\frac{625}{5}) = 125$ $\Rightarrow log_5(125)$ $\Rightarrow log_5 5^3$ $\Rightarrow 3$	$\left[\begin{array}{c} 0 \mathbf{g}_{s} \left[1 + \frac{1}{624} \right] - \\ (b) 3 \\ (d) 0 \end{array} \right]$	
Question 5 If $4x^3+8x^2-x-2 = 0$ then value of $2x - 3$ (a) $-4,2,-7$ (c) $4,2,7$ Answer: B Explanation: $4x^3+8x^2-x-2 = 0$ $4x^2 (x+2) - 1 (x+2) = 0$ $(x+2) (4x^2 - 1) = 0$ $x = -2, \frac{1}{2}, -1/2$ Then the value of $2x + 3$ at $x = -2$ $2 \times (-2) + 3 = -4 + 3 = -1$ at $x = \frac{1}{2}$	3 (b) -4,-2,-7 (d) $\frac{1}{2}, \frac{1}{2}, -2$	

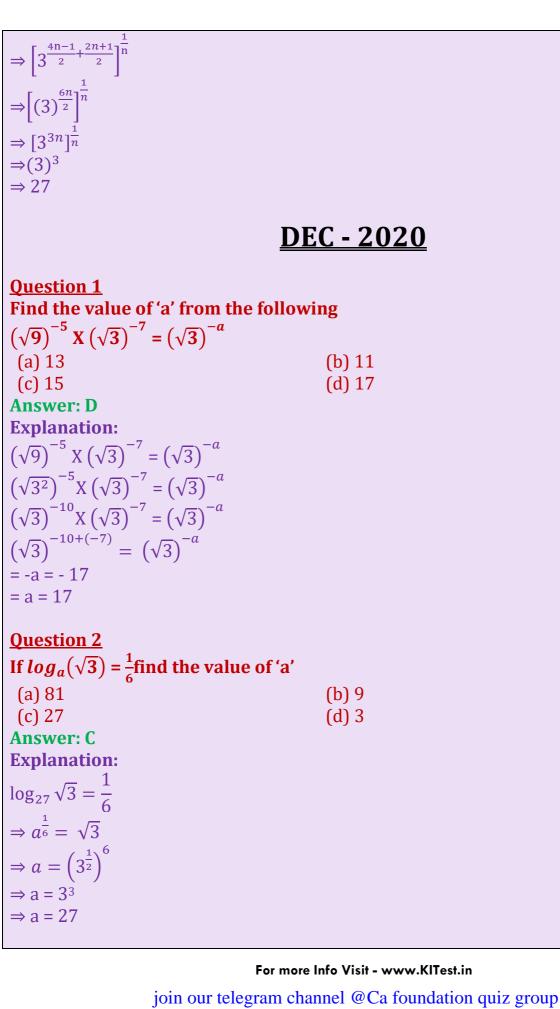
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2 × (-1/2) +3-1+3=2		
	<u> 2019 – NOV</u>	
<u>Question 1</u> The ratio of two numbers ar	a 3.4. The difference of t	hair squares is 28 Greater
no is:	e 5.4. The unierence of th	iten squares is 20 dicater
(a) 8	(b) 12	
(c) 24	(d) 64	
Answer: A		
Explanation: Let the two numbers bee x and	1 17	
Greater no. y	у	
Smaller no x		
According to questions,		
$\frac{x}{v} = \frac{3}{4}$ Eq1	and $y^2 - x^2 = 28$	-Eq2
Further solving Eq 1		
$X = \frac{3}{4}yEq3$		
Put Eq 3 in Eq 2		
$Y^2 - \left(\frac{3}{4}y\right)^2 = 28$		
$\frac{y^2}{1} - \frac{9y^2}{10} = 28$		
1 16		
$\frac{7y^2}{16} = 28$		
$Y^2 = \frac{28 \times 16}{7}$		
$Y^2 = 64$		
-	(square root both sides)	
So, the greater number i.e. y is	equal to 8.	
Question 2		
The price of scooter and mo	ped are in the ratio 7:9. 1	The price on moped is Rs.
1,600 more than that of scoo	-	oped is:
(a) 7,200	(b) 5, 600	
(c) 800 Answer: A	(d) 3700	
Explanation:		
price of scooter 7		
$\frac{1}{\text{price of moped}} = \frac{1}{9}$		
Let; the price of scooter = 7x a	nd price of moped = 9x	
According to question		
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9x = 7x + 16002x = 1600X = Rs800So; the price of moped = 9x = 9(800) = Rs.7200**Question 3** log_{0.01} 10, 000 =? (a) 2 (b) -2 (c) 4 (d) -4 **Answer: B Explanation:** log_{0.01} $=\log\left(\frac{1}{100}\right)$ $= \log\left(\frac{1}{10^2}\right)$ $= \log 10^{-2} \rightarrow \text{use property } x^{-n} = \frac{1}{x^n}$ = $-2 \log 10 \rightarrow$ use property $\log_b x^n = n \log_b x$ $= -2(1) \rightarrow \log 10 = 1$ = -2 **Question 4** Value of $\left[9^{n_4^1} \frac{\sqrt{3.3^n}}{3\sqrt{3^n}}\right]^{\frac{1}{4}}$ (a) 9 (b) 27 (c) 81 (d) 3**Answer: B Explanation:** $= \left[9^{n_4^1} \frac{\sqrt{3.3^n}}{3.\sqrt{3^n}}\right]^{\frac{1}{4}}$ $= \left[\frac{(3^2)^{\frac{4n+1}{4}}\sqrt{3^{n+1}}}{3\sqrt{3^{-n}}}\right]^{\frac{1}{n}}$ Since $\frac{a^m}{a^n} = a^{m-n}$ $\Rightarrow \left[\frac{3^{\frac{4n+1}{2}}}{3}, \frac{(3^{n+1})^{\frac{1}{2}}}{(3^{-n})^{\frac{1}{2}}}\right]^{\frac{1}{n}}$ $\Rightarrow \left[(3)^{\frac{4n+1}{2}-1} \times (3)^{\frac{n+1}{2}-\frac{(-n)}{2}} \right]^{\frac{1}{n}}$ $\Rightarrow \left[3^{\frac{4n-1}{2}} \times (3)^{\frac{2n+1}{2}}\right]^{\frac{1}{n}}$ Since $a^m \times a^n a^{m+n}$ For more Info Visit - www.KITest.in join our telegram channel @Ca foundation quiz group

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Question 3 Log 9 + log 5 is expressed as	
(a) log (9/5) (c) log (5/9) Answer: D	(b) log 4 (d) log 45
Explanation: $\log 9 + \log 5 = \log 9 \times 5$	
$\log = 45.$	
	of girls in a school is found to be 15: 32. How ould be added to bring the ratio to 2/3?
(a) 20 (c) 23	(b) 19 (d) 27
Answer: B Explanation:	
By option $\frac{15x + 19}{32x + 19} = \frac{2}{3}$	
45x+ 57 = 64x+38 19x= 19	
x= 19 Question 5	
Question 5 If a: b = 9:4 then $\sqrt{\frac{a}{b}} + \sqrt{\frac{b}{a}} = ?$	
(a) 2/3 (c) 6/13	(b) 3/2 (d) 13/6
Answer: D Explanation:	
a: b = 9:4 $\frac{a}{b} = \frac{9}{4}$ $\frac{3}{2} + \frac{2}{3} = \frac{9+4}{6} = \frac{13}{6}$	
Question 6	
If a: b = 3: 7 then 3a + 2b: 4a + 5b =? (a) 27 : 43	(b) 23 : 47
(c) 24 : 51 Answer: B Explanation:	(d) 29 : 53
$\frac{a}{b} = \frac{3}{7}$	
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Let a = 3x and b	
	$3x + 2 \times 7x = 23x$
$4a + 5b = 4 \times 3x$	
$\therefore \frac{3a+2b}{4a+5b} = \frac{23x}{47x} =$	23:47
4a+5b 47x	
	<u>IAN - 2021</u>
	······
Question 1	
Find the value	$af^{3t^{-1}}$
	$t^{-1/3}$
(a) $\frac{3}{t^{2/3}}$	(b) $\frac{3}{t^{32}}$
(a) $\frac{3}{t^{2/3}}$ (c) $\frac{3}{t^{1/3}}$	(b) $\frac{3}{t^{32}}$ (d) $\frac{3}{t^2}$
Answer: A	$(u) t^2$
Allswel: A	
Question 2	
	, then $\log_b(ab)$ is
	(b) $\frac{x}{1+x}$
(a) $\frac{1}{x_{r}}$	
(c) $\frac{x}{x-1}$	(d) None of these
Answer: C	
Explanation:	
We have,	
Log _a (ab)=x	
loga _a +log _a b=x	[log _a mn=log _a m+log _a n]
1+log _a b=x	[log _a a=1]
logab=x-1	(1)
Since,	
=log _b (ab)	
$=\log_{b}a + \log_{b}b$	
=log _b a+1	
	$= \frac{1}{\log_a b} + 1 \left[\frac{1}{\log_a m} = \log_m n \right] \frac{1}{x-1} + 1 \frac{1+x-1}{x-1}$
x	$\log_a b = \log_n m = 1 x - 1 x - 1$
$=\frac{x}{x-1}$	
Question 3	
	siness, A and B received Profit in a certain ratio; B and C received
	ame ratio. If A gets Rs. 1,600 and C gets Rs. 2,500, then how much
does B get?	$(h) D_{2} \rightarrow \Gamma 0 0$
(a) Rs. 2,000	(b) Rs. 2,500 (d) Rs. 1,500
(c) Rs. 1,000	(d) Rs. 1,500
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Answer: A

Explanation: let the ratio of profit of A and B is a:b \therefore Ratio of profit of B and C = a:b A:B B:C $a_{*a}:b_{*a}a_{*b}: b_{*b}$ Note: Value of B would be same in both cases A: B: C $a^2: ab: b^2$ According to the question, $a^2 = 1,600$ a = 40Similarly $b^2 = 2,500$ b = 50Amount received by B = ab = 40×50 = 2000

Question 4

The ratio of two quantities is 15:17. If the consequent of its inverse ratio is 15, then the antecedent is.

(a) 15	(b) $\sqrt{15}$
(c) 17	(d) 14
Answer: C	
Explanation:	

If consequent is 15 i.e., 15 so 17 will be answer It's just a inverse

Question 5

The salaries of A, B and C are in the ratio 2:3:5. If increments of 15%, 10% and 20% are allowed respectively to their salaries, then what will be the new ratio of their salaries?

(a) 3:3:10(c) 23:33:60 **Answer: C Explanation:** Let A=2k, B=3k and C=5k. A's new salary $\frac{115}{100}$ of 2k (b) 10 : 11 : 20(d) Cannot be determined

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 $\left(\frac{115}{100} \times 2k\right) = \frac{23}{10}$ B's new salary $\frac{110}{100} of \ 3k$ $\left(\frac{110}{100} \times 3k\right) = \frac{33}{10}$ C's new salary $\frac{120}{100} of \ 5k$ $\left(\frac{120}{100} \times 5k\right) = 6k$ $\therefore New \ ratio$ $= \frac{23k}{10} : \frac{33k}{10} : 6k$ = 23:33:60

<u>JULY – 2021</u>

Question 1

If xy + yz + zx = -1, the value of $\left(\frac{x+y}{1+xy} + \frac{z+y}{1+zy} + \frac{x+z}{1+zx}\right)$ is (b) $\frac{-1}{yz}$ (d) $\frac{1}{x+y+z}$ (a) xyz (c) $\frac{1}{xyz}$ **Answer: Options (c) Explanation**: Xy + yz + zx = 1Z(x + y) = 1 - xy $\frac{x+y}{1-xy} = \frac{1}{z} \qquad -> \text{Equation (1)}$ $\frac{y+z}{1-yz} = \frac{1}{z}$ -> Equation (2) $\rightarrow \frac{x+y}{1-xy} + \frac{y+z}{1-yz} + \frac{z+x}{1-zx}$ $=\frac{1}{z}+\frac{1}{x}+\frac{1}{y}$ $=\frac{xy+yz+zx}{z}$ xyz xyz

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Ouestion 2 If $\log_4 x + \log_{16} x + \log_{64} x + \log_{256} x = 25/6$ then the value of x is (a) 64 (b) 4(c) 16 (d) 2**Answer: Options (c) Explanation:** $\log_4 x + \log_{16} x + \log_{64} x + \log_{256} x = \frac{25}{6}$ $\rightarrow \frac{1}{\log_{r} 4} + \frac{1}{2\log_{r} 4} + \frac{1}{3\log_{r} 4} + \frac{1}{4\log_{r} 4} = \frac{25}{6}$ $\Rightarrow \frac{1}{\log_{x} 4} \left(1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} \right) = \frac{25}{6}$ → $\log_4 x \left(\frac{12+6+4+3}{12}\right) = \frac{25}{6}$] $\rightarrow \log_4 x \left(\frac{25}{12}\right) = \frac{25}{6}$ Inverse the fraction both side $\rightarrow \log_4 x \frac{25}{25} = \frac{12}{6}$ \rightarrow Log x = (4)² \rightarrow x = 16 **Question 3** The salaries of A, B and C are of ratio 2:3:5. If the increments of 15%, 10% and 20% are done their respective salaries, then find the new ratio of the salaries. (a) 23:33:60 (b) 33:23:60 (c) 23:60:33 (d) 33:60:23 Answer: Options (a) **Explanation:** Let the constant be x Then, Salaries of A, B, C are 2x, 3x, 5x respectively. Increments in Salary of A = 15%Therefore A's new salary = Rs. $(2x + \frac{15}{100} \times 2x) = \text{Rs.} \frac{230x}{100}$ Increment in B's new salary = Rs. 10% Therefore, B's new salary = Rs. $(3x + \frac{10}{100} \times 3x) = \text{Rs.} \frac{330x}{100}$ Increment in C's salary = 20% Therefore C's new salary = Rs. $(5x + \frac{20}{100} \times 5x)$ = Rs. 6x Therefore our ratio is 23: 33: 60

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<u>DEC – 2021</u>

Ouestion 1 Let a = $(\sqrt{5}+\sqrt{3})$ ($\sqrt{5}-\sqrt{3}$) and b= ($\sqrt{5}-\sqrt{3}$) ($\sqrt{5}+\sqrt{3}$). What us the value of a² + b² (a) 64 (b) 62(d) 254 (c) 62 **Answer: b Explanation:** $a = \frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} - \sqrt{3}} = \frac{3.9681}{0.5040} = 7.8732$ $a = \frac{\sqrt{5} - \sqrt{3}}{\sqrt{5} + \sqrt{3}} = \frac{0.5040}{3.9681} = 0.1270$ $a^{2}+b^{2} = (7.8732)^{2} + (0.1270)^{2} = 62$ **Question 2** Income of R and S are in the ration 7:9 and their expenditures are in the ratio 4:5 Their expenditures are in the ratio 4:5. Their total expenditure is equal to income of R. What is the ratio of their savings? (a) 23:36 (b) 21:43 (c) 28:41 (d) 35:46 Answer: d **Explanation:** Let the incomes of R and S be7x and 9x respectively, and their expenditures be 4y and 5y respectively. Savings of R = 7x-4ySavings of S = 9x-5yAlso, it given that their total expenditures is equal to the income R. Therefore, 4y+5y = 7x= 9y = 7x $x = \frac{9y}{7}$...Eq. (1) Ratio of their expenditures $\frac{7x-4y}{9x-5y}$ Putting the value of $x = \frac{9y}{7}$ from Eq 1 Above: $\left(\frac{9y}{5}\right) - 5y$ 5y81y - 35y

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$ \frac{7 \times 5y}{46y} \\ \frac{35}{46} $		
Question 3 A bag contains 105 coins containing som of the number of these coins is 4:3. The t number of these coins is 4:3. The total va (a) 43.25 (c) 39.25 Answer: b Explanation: No. of 50 paise coins =	otal value coins. The ratio of the	
$\frac{4}{7} \times 105 = 60$ No. of 25 paise coins $=\frac{3}{7} \times 105 = 45$ Value of 1 50 paisa coin = Rs.0.50 Therefore, value of 60-50 paisa coins = 60× Value of 1 25-paise coin = Rs0.25 Therefore, value of 45-25 paisa coins = 45× Therefore, total value = Rs 30+Rs 11.25 = R	x 0.25 = Rs = 11.25	
Question 4 If $Log_{10} 3=x$ and $log_{10} 4=y$, then the valu	e of log ₁₀ 120 can be expressed as	
(a) x-y+1 (c) x+y-1 Answer: b Explanation: $Log_{10} 120 = log_{10} (3 \times 4 \times 10)$ $= log_{10} 3 + log_{10} 4 + log_{10} 10$ = x+y+1	(b) x+y+1 (d) 2x+y-1	
Question 5 Find the value of $log(x^6)$, if $log(x) + 2 log(x^2) + 3 log(x^3) = 14$		
(a) 3 (c) 5 Answer: d Explanation: $\log (x) + 2\log(x^2) + 3\log (x^3) = 14$ $\log x + (2 \times 2) \log x + (3 \times 3) \log x = 14$ $\log x + 4 \log x + 9\log x = 14$	(b) 4 (d) 6	
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$14 \log x = 14$	
$\log x \frac{14}{14} = 1$	
$Log(x^{6}) = 6 log x = 6 \times 1 = 6$	
Question 6	
The value of $\frac{6^{n+4}3^{n+3} \times 2^{n+3}}{5 \times 6^n + 6^n}$ is	
	o) 242
	1) 262
Answer: c	
Explanation:	
We can see that none of the option are in term	s of n. This means that n is ultimately
going to get cancelled out. Therefore, we can t	ake any value and put it in place of n,
and we'll get the same answer. For the sake of	simplicity, let n=1.
Now,	
$= \frac{6^{n+4}3^{n+3} \times 2^{n+3}}{2^{n+3}}$	
$=\frac{5 \times 6^{n} + 6^{n}}{5 \times 6^{n} + 6^{n}}$	
$\frac{6^{1+4}3^{1+3} \times 2^{1+3}}{5}$	
$5 \times 6^{1} + 1$ $6^{5} + 3^{4} \times 2^{4}$	
$5 \times 6 + 6$ 7776 + 81 × 16	
$= \frac{30+6}{30+6}$	
7776 + 1296	
$=\frac{36}{36}$	
$=\frac{9072}{1000000000000000000000000000000000000$	
36	
=252	
Question 7	
Ina department, the number if males and fe	emales are in the ratio 3.2. If 2 males
and 5 females join the department, then th	
number of females in the department is	
-	o) 6
	Í) 8
Answer: b	
Explanation:	
Let the initial number of males and females be	a 3x and 2x respectively.
As per the question, $\frac{3x+2}{2x+5} = \frac{1}{1}$	
3x+2 = 2x+5	
3x-2x=5-2	
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X=3 Therefore, initial number of females = $2 \times 3 = 6$ **Question 8** If, $\left(\frac{3a}{2b}\right)^{2x-4} = \left(\frac{2b}{3a}\right)^{2x-4}$, for some a and , then the value of x is (b)6 (a) 8 (c) 4 (d) 2Answer: d **Explanation:** Looking at the options, you'll that if x is 2, then the powers of the LHS as well as RHS will become 0. Therefore, LHS and RHS both will be 1, and hence, be equal. **Question 9** The value of $\left(1 - \sqrt[3]{0.027} \left(\frac{5}{6}\right) \left(\frac{1}{2}\right)^2\right)$ is: (a) 11/16 (b) 13/16 (c) 15/16 (d) 1 Answer: c **Explanation**: $\left(1 - \sqrt[3]{0.027} \left(\frac{5}{6}\right) \left(\frac{1}{2}\right)^2\right)$ $\left(1 - \sqrt[3]{\frac{27}{1000}} \left(\frac{5}{6}\right) \left(\frac{1}{2}\right)^2\right)$ $\left(1-\left(\frac{3}{10}\right)\left(\frac{5}{24}\right)\right)$ $\left(1-\left(\frac{1}{2}\times\frac{1}{8}\right)\right)$ 1 16 $\frac{16-1}{16} = \frac{15}{16}$ Alternatively, On calculator, calculator $\sqrt[3]{0.027}$, or $(0.027)^{\frac{1}{3}}$. Follow the following steps. First, enter 0.027 on the calculator, then press the square root button 12 times. You'll get 0.99911857266 Then, from this, subtract 1 i.e., press -1 You" get -0.00088142734. Then, multiply this number with the power, i.e., 1/3. Press $\times 1 \div 3$ =. You''ll get -For more Info Visit - www.KITest.in

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0.00029380911.

Then add 1 to it, i.e., press +1. You''ll get 0.99970619089. Then press the button ($\times =$) 12 times. You'll get 0.30010617315.

This is $(0.027)^{\frac{1}{3}}$

Now, multiply this number with $\left\{\frac{5}{6}\left(\frac{1}{2}\right)^2\right\}$

You'll get 0.625221194. Then press M+ This will save this number in the memory of your calculator. Then press 1-MRC =. You'll get 0.9374778806. This is your final answer. Now, try the options. Option (a) = 11/16 11/16 = 0.8125not equal to 0.9375 Option (b) = 13/16 13/16 = 0.8125 is not equal to 0.9375 Option c= 15/16 15/16 = 0.9375 So answer is (c)

<u>JUNE – 2022</u>

Question 1		
$\log\left(\frac{p^2}{qr}\right) + \log\left(\frac{q^2}{qr}\right) + \log\left(\frac{r^2}{pq}\right)$ is :		
(a) pqr	(b) 0	
(c) 1	(d) None	
Answer: Options (b)		
Explanation:		
$\log\left(\frac{p^2}{qr}\right) + \log\left(\frac{q^2}{qr}\right) + \log\left(\frac{r^2}{pq}\right)$ is :		
$= \log\left(\frac{p^2}{qr} \times \frac{q^2}{pr} \times \frac{r^2}{pq}\right)$ $= \log\left(\frac{p^2}{p^2} \frac{q^2}{q^2} \frac{r^2}{r^2}\right)$		
$= \log\left(\frac{p^2}{p^2}\frac{q^2}{q^2}\frac{r^2}{r^2}\right)$		
= log 1		
= 0		
Question 2		
$\log \sqrt{3} = 6$ base a, then 'a' will be:		
(a) 27	(b) 36	
(c) 15	(d) 1	
Answer: Options (a)		
Explanation:		
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Here $\log \sqrt{3} a = 6$ \Rightarrow a = $(\sqrt{3})$ $\Rightarrow a = \left(3^{1/2}\right)^{6_3}$ $a = 3^3$ a = 27 **Question 3** A box contains 25 paise coins and '10' paise coins and 5 paise coins in ratios 3:2:1 and total money is ₹ 40. How many '5' paise coins are there? (a) 65 (b) 55 (c) 40 (d) 50**Answer: Options (c) Explanation:** The ratio of No. fo 25p coins, 10p coins and 5p coins = 3:2:1 Let No. of 25p coins = 3xNo. of 10p coins = 2xNo. of 5p coins = xTotal value of all coins = 4000 paise $25p \times 3x + 10p \times 2x + 5p \times x = 4000 p$ (75x + 50x + 5x)p = 4000p100x = 4000 $x = \frac{4000}{100}$ x = 40No. f paise coins = x = 40**Question 4** If x: y = 4: 6 and z: x = 4: 6 find y? (a) 4 (b) 6 (c) 16 (d) 1 **Answer: Options (b) Explanation:** If x:y = 4:6 and z:x = 4:1 find y \Rightarrow z:x = 1:4 so, y:x= 6:4 and x:z = 4:1 y:x:z = 6:4:1 so, y = 6 **Question 5** If $(\sqrt{3})^{18} = (\sqrt{9})^x$, find x? (a) 18 (b) 9

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(c) 8 Answer: Options (b) Explanation: If $(\sqrt{3})^{18} = (\sqrt{9})^{x}$ $(3^{\frac{1}{2}})^{18} = (3)^{x}$ $3^{9} = 3^{x}$ On comparing 9 = x	(d) 19
Question 6 $\log \sqrt{2}$ 64 is equal to: (a) 12 (c) 1 Answer: Options (a) Explanation: $\log \sqrt{2}$ 64 = $\frac{\log 64}{\log \sqrt{2}} = \frac{\log 2^6}{\log (2)^{\frac{1}{2}}} = \frac{6\log 2}{\frac{1}{2}\log 2} = 6 \times 2 = 1$	(b) 6 (d) 8
	<u>2022</u>
Question 1 If the roots of the equation $x^2 \cdot px + q = 0$ a) $p^2 = 25 q$ c) $6 p^2 = 5q$ Answer: d Explanation: If the ratio of the quadratic equation $X^2 \cdot Px + q = 0$ Roots: a, b a : b = 2 : 3 $\frac{a}{b} = \frac{2}{3}$ $\therefore a = \frac{2b}{3}$ a + b = -(-p) = p ab = q a + b = p $\frac{2b}{3} + b = p$ $\frac{2b+3b}{3} = p$	are in the ratio 2:3, then b) $p^2 = 6q$ d) $6p^2 = 25q$
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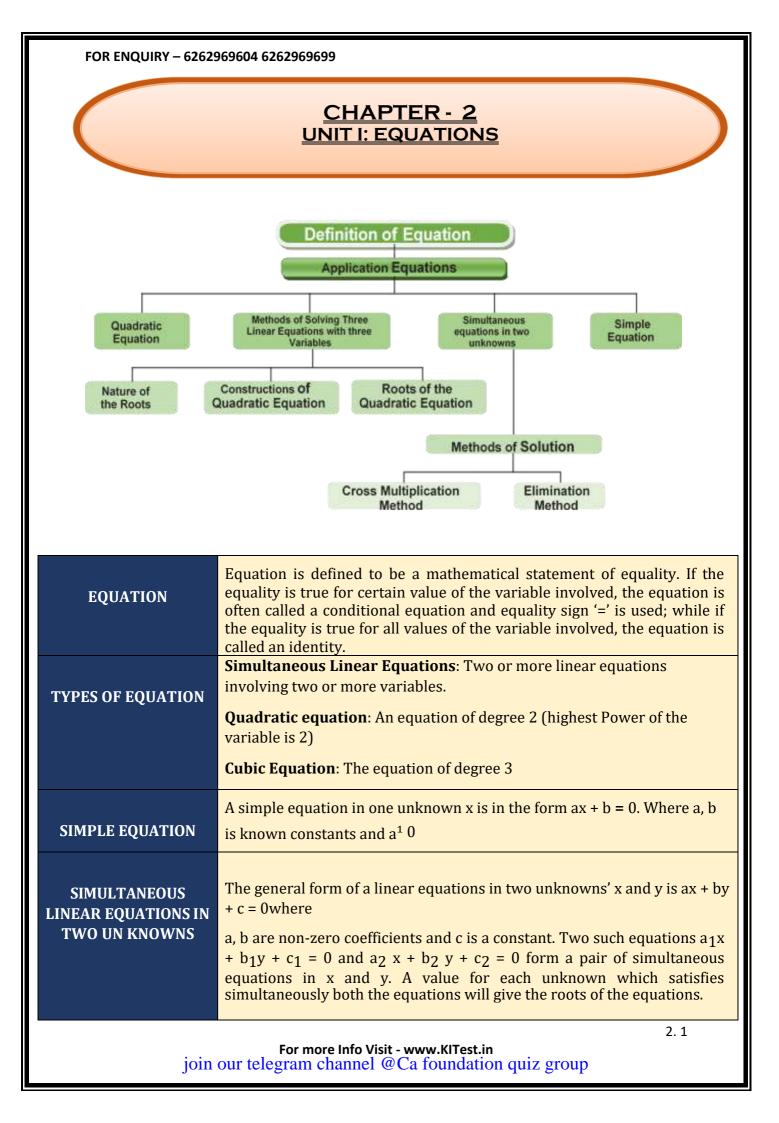
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$\frac{5b}{3} = p$
$\overline{3} - p$
ab = q
$=\frac{2b}{b}b=q$
$3 \frac{1}{2h^2}$
$=\frac{2b}{3}b = q$ $= q = \frac{2b^2}{3}$
$(z^2) (5b)^2$
$= 6p^2 = 6\left(\frac{3}{3}\right)$
$= 6 \times \frac{25b^2}{10}$
59
$=\frac{50D}{2}$
$= 6p^{2} = 6\left(\frac{5b}{3}\right)^{2}$ = $6 \times \frac{25b^{2}}{9}$ = $\frac{50b^{2}}{3}$ = $25 \times \frac{25b^{2}}{3}$
$= 25 \times \frac{1}{3}$
= 25q
Question 2
If $\log_{10} 2 = y$ and $\log_{10} 3 = x$, then the value of $\log_{10} 15$ is:
a) x-y+1 b) x+y+1
c) x-y-1 d) y-x+1
Answer: b
Explanation:
Let, x=log 60
$\therefore x = \log(2^2 \cdot 3 \cdot 5)$
$\therefore x = \log^2 2 + \log^3 2 \log^2 0 / 2$ (logx.y = logx + logy)
$\therefore x = 2\log 2 + \log 3 + 1 - \log 2 \qquad \dots (\log xy = y \log x)$
$\therefore x = \log 2 + \log 3 + 1$
$\therefore x = x + y + 1$
Question 3
log₃ 4 . log ₄ 5. log ₅ 6. log ₆ 7. log ₇ 8. log ₈ 9 equal to: a) 3 b) 2
c) 1 d) 0
Answer: b
Explanation:
$\log_3 4 \cdot \log_4 5 \cdot \log_5 6 \cdot \log_6 7 \cdot \log_7 8 \cdot \log_8 9$
$= \frac{\log 4}{\log 3} \times \frac{\log 5}{\log 4} \times \frac{\log 6}{\log 5} \times \frac{\log 7}{\log 6} \times \frac{\log 8}{\log 7} \times \frac{\log 9}{\log 8}$
$=\frac{\log 9}{\log 2}$
_ log3

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$\frac{\log 3^2}{\log 3} = \frac{2\log 3}{\log 3} = 2$	
Question 4 A sum of money is to be distribution amo 5:2:4:3. If C gets Rs. 1000 more than D, w a) 2000	
c) 2500	d) 1000
Answer: a Explanation: let x be the ratio factor . So, $5x+2x+4x+3x = total$ money. So, we can say 5^*x is the money given to A, $2 \times x$ is the money given to B, $4 \times x$ is the money given to C, $3 \times x$ is the money given to D. now, it is said that C gets 1000 more than D ie difference between the amount C and D g So, $4 \times x-3 \times x=1000$. x=1000. So we found the ratio factor to be 1000. Now the amount of money B get is equal to Therefore the share of B is 2000.	et is 1000.
Question 5 By simplifying $(2a^3b^4)^6/(4a^3b)^2 \times (a^2b^2)^6$ a) $4a^2b^2$)), the answer will be b) 4a²b^{2b}
c) 4a ³³ b ³³	d) 4 $a^{10} b^{20}$
Answer: d Explanation: $ \frac{(2a^{3}b^{4})^{6}}{(4a^{3}b)^{2}} \times a^{2}b^{2} $ $ \frac{2^{6}a^{18}b^{24}}{(4^{2}a^{6}b^{2})a^{2}b^{2}} $ $ \frac{64a^{18}b^{24}}{(16a^{6}b^{2})a^{2}b^{2}} $	
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$ \frac{4a^{18}b^{24}}{a^8b^4} $ = 4 a^{10} b^{20} Question 6 A group of 400 soldiers posted at border 28 days 280 soldiers from this group we	re called back. Find the number of days
for which the remaining ration will be su a) 3	b) 6
c) 8	d) 10
Answer: d Explanation: 400 soldiers = 31 days => each day the garrison serves = 400 soldi soldiers consumes 1 unit of ration. So total days -> units consumed = 400*28 = 11200 units. Remaining units = 12400 - 11200 = 1200 units. Remaining days = 3 days and revised soldie = 400-280 = 120 men. No. of days = 1200 / 120 = 10 days.	no. of ration units = 12400 units. In 28 nits.



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ELIMINATION METHOD	In this method two given linear equations are reduced to a linear equation in one unknown by eliminating one of the unknowns and then solving for the other unknown.
CROSS MULTIPLICATION METHOD	Let two equations be: $a_1x + b_1y + c_1 = 0$ $a_2x + b_2y + c_2 = 0$ $x = \frac{b_1c_2 - b_2c}{a_1b_2 - a_2b_1}$ $x = \frac{c_1a_2 - c_2a_1}{a_1b_2 - a_2b}$
QUADRATIC EQUATION	An equation of the form $ax^2 + bx + c = 0$ where x is a variable and a, b, c are constants with $a^1 \neq 0$ is called a quadratic equation or equation of the second degree. When b=0 the equation is called a pure quadratic equation; when b = 0 the equation is called an affected quadratic. The roots of a quadratic equation: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
CONSTRUCT A QUADRATICEQUATION	x^2 – (Sum of the roots) x + Product of the roots = 0
Questions ? Answ	? Vers ?

Question: 1 If one root of a equation is $2+\sqrt{5}$, then the quadratic equation is : (a) $x^2 + 4x - 1 = 0$ (b) $x^2 - 4x - 1 = 0$ (c) $x^2 + 4x + 1 = 0$ (d) None of these Answer: b Explanation: One root of the equation is $2 + \sqrt{5}$. So, the next root will be $2 - \sqrt{5}$ $\therefore x = 2 + \sqrt{5}$ and $x = 2 - \sqrt{5}$ $\therefore (x - (2 + \sqrt{5})) (x - (2 - \sqrt{5})) = 0$

 $\therefore (x^2 + (4-5) - 2x - \sqrt{5x} - 2x + \sqrt{5x}) = 0$ $\therefore x^2 - 4x - 1 = 0 \text{ is the required quadratic equation.}$

Ouestion:2 The equation of a line which is perpendicular to 5x - 2y = 7 and passes through the mid – point of line joining (2, 7) and (-4, 1) is: (a) 2x - 5y - 18 = 0(b) 2x + 5y + 18 = 0(d) None of these (c) 2x + 5y - 18 = 0**Answer: c Explanation**: First let us find out the coordinates of the midpoint of the line joining (2,7) and (-4,1) using midpoint formula and let this point be P. P(x, y) = [(x1+x2)/2, (y1+y2)/2]=> P(x,y) = [(2-4)/2, (7+1)/2]=> P(x, y) = (-1, 4)as we have coordinates of P, to form an equation, we need to get the slope of this line. Since the line passing through P is perpendicular to the line 5x-2y=7, we can find the required slope by using the formula $M1 \times M2 = -1$, where M1 is the slope of the given line and M2 is the slope of the line we are supposed to form an equation for. to find M1, let us rewrite the given equation in y = M1X + C form. 5x - 2v = 7=> - 2y = -5x + 7=> y = -5x/-2 + 7/(-2)=> y = 5/2 x - 7/2On comparing this equation with y = M1X + cWe get M1 = 5/2Now using the equation $M1^*M2 = -1$, we get $5/2 \times M2 = -1$ Therefore M2 = -2/5Now as we know M2 and coordinates of P (-1,4) can use slope point form to get the equation => (y - y1) = M2(x - x1)=> y - 4 = -2/5(x - (-1))=> y - 4 = -2/5(x + 1)=> 5(y - 4) = -2(x + 1) [by cross multiplication] => 5y - 20 = -2x - 2=> 2x + 5y - 18 = 0 is the answer **Question:3** Find the positive value of k for which the equations: $x^2 + kx + 64 = 0$ and $x^2 - 8x + k$ = 0 will have real roots:

(a) 12 (b) 16 (c) 18 **Answer: b Explanation:** For real roots, discriminant = $b^2 - 4ac = 0$ For $x^2 + kx + 64 = 0$ = $k^2 - 4 \times 1 \times 64 = 0$

```
= k^{2} - 256::: = 0
= k<sup>2</sup> ::: 256
= k :: 16
For x<sup>2</sup>-8x+k = 0
= (-8)<sup>2</sup> - 4 × 1 × k = 0
= 64-4k = 0
= 4k = 64
= k = 16
Hence, k = 16
```

Question:4

(a) 1300, 50

A man starts his job with a certain monthly salary and earns a fixed increment every year. If his salary was f 1,500 after 4 years of service and 1,800 after 10 years of service, what was his starting salary and what is the annual increment in rupees?

(b) 1100,50

(c) 1500, 30 Answer: a Solution: Let the starting salary be x and the annual increment be y. Then, x+4y = 1500 X + 10y = 1800 X + 10y = 1800 X + 10y = 1800 X + 4y = 1500 6y = 300 Y = 50Subtracting y = 50 in (1), we get x = 1,300 Therefore, starting salary = x = 1,300 Annual increment = y = 50.

Question:5

The value of k for which the points (k, 1), (5,5) and (10,7) may be collinear is: (a) k = -5(b) k = 7(d) k = 1(c) k = 9Answer: a Solution: The given points are collinear 5 5 1 ⇒ k 1 1 = 0 10 7 1 5 5 1 $-4 \quad 0 = 0 [R_2 \rightarrow R_2 - R_1 \text{ and } R_3 \rightarrow R_3 - R_1]$ ⇒ |k - 5|0

 $\begin{vmatrix} 5 & 2 & 0 \\ \Rightarrow & 1. [2(k-5) + 20] = 0 \\ \Rightarrow & 2k + 10 = 0 \\ \Rightarrow & K = -5 \end{vmatrix}$

Hence, k = -5

Question: 6

A man went to the Reserve Bank of India with – 1,000. He asked the cashier to give him Rs.5 and 10 notes only in return. The man got 175 notes in all. Find how many notes of 5 and f 10 did he receive?

(b) (40, 110) (a) (2, 150) (c) (150,25) (d) None **Answer: c** Solution: Let the number of notes of, 5 be x and notes of 10 be y. Then x + y = 1755x + 10y = 1000Solving (1) and (2) simultaneously, we get 5x + 5y = 8755x + 10y = 1000(-)(-)(-)-5y = -125Y = 25 X = 150**Ouestion: 7** If (2+y'3) is a root of a quadratic $x^2 + px + q = 0$, then find the value of p and q. (a)(4,-1)(b)(4,1)(c)(-4,1)(d)(2,3)**Answer: c Solution:** If one of the roots of the quadratic is $2+\sqrt{3}$, then other root is $2-\sqrt{3}$ Sum of roots = $(2 + \sqrt{3}) + (2 - \sqrt{3}) = 4$ Product of roots = $(2 + \sqrt{3})(2 - \sqrt{3}) = 4 - 3 = 1$ Required equation is: X^2 – (sum of roots) x + product of roots = 0 $0r x^2 - 4x + 1 = 0$

Now comparing with $x^2 + px + q = 0$ We get, p = -4 and q = 1Required answer is (-4.1)

Question: 8

The length of the rectangle is 5 cm more than its breadth if the perimeter of the rectangle is 40 cm find the area of rectangle

(a) 7.5 cm, 2.5 cm (b) 10 cm, 5cm (c) 12.5 cm, 7.5 cm **Answer: c Solution:** Let the breadth of the rectangle be x cm. Length = x + 5 cm Perimeter = 2 (l + b) = 2 (x + 5 + x) = 4x+10 cm 4x+10 = 40 4x = 30 X = 30/4 = 7.5So breadth = 7.5 cm; length = 12.5 cm

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K = -8So, the equation of the straight line is 3x + 5y - 8 = 0.

Ouestion: 12 If one root of the equation x²-3x+k=0 is 2, then value of k will be: (a) 1 (b) 0 (c) 2 (d) 10 **Answer: c** Solution: $X^2 - 3x + k = 0$ One root = 2Putting x = 2, we get $(2)^2 - 3(2) + k = 04 - 6 + k = 0$ K = 2

Ouestion: 13

If |x-2|+|x-3| = 7 then, 'x' will be equal to (a) 6 (b) -1 (d) none (c) 6 and -1 Answer: a Solution: If |x - 2| + |x - 3| = 7If x - 2 = 0 and x - 30(x-2) + (x-3)' = 7X - 2 + x - 3 = 72x = 7 + 2 + 3 $2x = 12 \Rightarrow x = 6$

Question: 14

If thrice of A's age 6 years ago be subtracted from twice his present age, the result would be equal to his present ages. Find A's present age.

(a) 9 (b) 10 (c) 11 (d) 12 Answer: a Solution: Let x years be A's present age by the question 2x-3(x-6) = x0r 2x - 3x + 18 = x0r - x + 18 = x0r 2x = 18Or x = 9

A's present age is 9 years.

<u>Question: 15</u>

A number consist of two digits the digit in the ten's place is twice the digit in the unit's place. If 18 be subtracted from the number, the digits are reversed. Find the number. (a) 40

(b) 42

(c) 39 (d) 21 Answer: b Solution: Let x be the digit in the unit's place .so the digit in the ten's Place is 2x. Thus the number becomes 10(2x) + x. By the question 20x + x - 18 = 10x + 2x0r 21x - 18 = 12x0r 9x = 18Or x = 2So the required number is $10(2 \times 2) + 2 = 42$ **Ouestion: 16** For a certain commodity the demand 'd' in kg, for a price 'p' in rupees per kg, is d = 100(10 - p). The supply equation giving the supply s in kg. for a price p in rupees per kg. is s 75(p - 3). The market price is such at which demand equals supply. Find the market price and quantity that will be bought and sold. (b) 300 (a) 230(d) 390 (c) 600**Answer: b Solution:** Given d = 100(10 - p) and s = 75 (p - 3)Since the market price is such that demand (d) = supply(s) We have 100(10 - p) and s = 75 (p - 3) Or 1000 – 100p = 75p – 225 1000 + 225 = 75p + 100p1225 = 175pP = 7So, market price of the commodity is 7 per kg. The required quantity bought = 100(10-7) = 300 kg. And the quantity sold = 75(7-3) = 300 kg. **Question: 17** The denominator of a fraction exceeds the numerator by 5 and if 3 be added to both the fraction becomes $\frac{3}{4}$, find the fraction.

(a) $\frac{11}{17}$ (b) $\frac{12}{17}$ (c) $\frac{13}{17}$ (d) $\frac{14}{18}$ Answer: b Solution: Let x be the numerator and the fraction be $\frac{x}{x+5}$ By the question $\frac{x+3}{x+5+3} = \frac{3}{4}$ or 4x + 12 = 3x + 24 or x = 12The required fraction is $\frac{12}{17}$

<u>Question:18</u> Solve 2x +5 y = 9 and 3x - y = 5.

(a) x = 2, y = 1(b) x = 2, y = 2(c) x = 1, y = 1(d) x = 2, y = 0.Answer: a Solution: $2x + 5y = 9 \dots$ (i) $3x - y = 5 \dots$ (ii) By making (i) $\times 1, 2x + 5y = 9$ and by making (ii) $\times 5, 15x - 5y = 25$ Adding 17x = 34 or x = 2. Subtracting this value of x in (i) i.e. 5y = 9 - 2x we find: 5y = 9 - 4 = 5 Y = 1X = 2, y = 1

Question: 19

The age of a man three times the sum of the ages of his two sons and 5 years hence his age will be double the sum of their ages. Find the present age of the man?

(a) 40 years	(b) 41years
(c) 55 years	(d) 45 years
An anno d	

Answer: d Solution:

Let x years be the present age of the man and sum of the present ages of the two sons be y years.

By the condition x = 3y (i) And x+5 = 2 (y+5+5) (ii) From (i) & (ii) 3y+5 = 2 (y+10) Or 3y + 5 = 2y + 20Or 3y - 2y = 20 - 5Or y = 15 $X = 3 \times y = 3 \times 15 = 45$ Hence the present age of the main is 45 years

Question: 20

Examine the nature of the roots of the following equations $x^2 - 8x + 16 = 0$

(b) roots are real, rational and unequal

(d) roots are real irrational and unequal

(a) roots are real and equal (c) roots are imaginary and unequal **Answer: a Solution:** a = 1, b = -8, c = 16 $b^2 - 4ac = (-8)^2 - 4.1.16 = 64 - 64 = 0$ The roots are real and equal.

Question: 21

Two times a number, decreased by 12 equals three times the number, decreased by 15. Which is the number? (a) 3 (b) -62 (b) -64 (d) 6 Answer: a Solution:

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Let us denote the number with n. We rewrite the problem as 2n-12=3n-15. We substract 2n from both sides and get -12=n-15. Then we add 15 to both sides in order to get n=3.

(b) $\frac{b \pm \sqrt{b^2 - 4ac}}{2a}$

(d) None

Ouestion: 22

The roots of a quadratic equation:

(a) $\frac{-b\pm\sqrt{b^2-4ac}}{a}$ 2a (c) Either a or b Answer: a

Solution:

The nature of the roots α and β of equation $ax^2+bc+c=0$ depends on the quantity or expression ($b^2 - 4ac$) under the square root signHence the expression ($b^2 - 4ac$) is

Called the discriminant of the quadratic equation $\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

Question:23

Which of the following is correct?

I. If $b^2-4ac = 0$ the roots are real and equal;

II. If $b^2-4ac > 0$ then the roots are imaginary;

III. If b^2 -4ac <0 then the roots are equal;

IV. If b²-4ac is a perfect square (0) the roots are real, rational and unequal

V. If b²-4ac>0 but not a perfect square the roots are real, irrational and unequal.

(a) All the correct (c) all are correct expect ii & iii **Answer: c**

(b) ii & iii (d) i& iii & iv is correct

Solution:

I. If $b^2-4ac = 0$ the roots are real and equal

II. If $b^2-4ac > 0$ then the roots are real and unequal (or distinct);

III. If b^2 -4ac <0 then the roots are imaginary;

IV. If b²-4ac is a perfect square (0) the roots are real, rational and unequal (distinct); v. If b^2 -4ac >0 but not a perfect square the roots are real, irrational and unequal Since b²-4ac discriminates the roots b²-4ac is called the discriminant in the equations $ax^{2} + bx + c = 0$ as it actually discriminates between the roots.

Ouestion: 24

Find the roots of the quadratic equation: $x^2 + 2x - 15 = 0$? (b) 3,-5 (a) 5, 3 (c) -3,5 (d) -3, -5 Answer: b Solution: $X^2 + 5x - 3x - 15 = 0$ X(x+5) - 3(x+5) = 0(x-3)(x+5) = 0= > x = 3 or x = -5.

Ouestion: 25

FOR ENQUIRY - 6262969604 6262969699 The sum of the squares of two consecutive positive integers exceeds their product by 91. Find the integers? (a) 9, 10 (b) 10, 11 (d) 12, 13 (c) 11, 12 Answer: a Solution: Let the two consecutive positive integers be x and x + 1 $X^{2} + (x + 1)^{2} - x (x + 1) = 91$ $X^2 + x - 90 = 0$ $(x+10)(x-9) = 0 \Rightarrow x = -10 \text{ or } 9.$ As x is positive x = 9Hence the two consecutive positive integers are 9 and 10. **Ouestion: 26** A number is equal to 4 times this number less 75. What is the number? (b) 35 (a) 15 (c) 25(d) 20 **Answer: c** Solution: Let us denote the number with n. The problem can be rewritten as n=4n-75. By subtracting n from both sides, we get 3n-75=0 Now we divide both sides by 3 to get n-25=0, or n=25. **Ouestion: 27** If $\sqrt{3-2x} + \sqrt{7+2x} = 4$, then find the positive value of x? (a) -3, 1 (b) 3, -1 (c) 3, -2 (d) 3,2 Answer: a Solution: Given, $\sqrt{3 - 2x} + \sqrt{7 + 2x} = 4$ Or, $\sqrt{3-2x} = 4 - \sqrt{7+2x}$ Squaring on both sides, we get

- $(\sqrt{3-2x})^2 = (4 \sqrt{7+2x})^2$ $\Rightarrow 3 - 2x = 16 + 7 + 2x - 8\sqrt{7+2x}$ $\Rightarrow 4x + 20 = 8\sqrt{7+2x}$ $\Rightarrow X + 5 = 2\sqrt{7+2x}$ Again squaring on both sides, we get $(x + 5)^2 = (2\sqrt{7+2x})^2$ $\Rightarrow x^2 + 10x + 25 = 4(7 + 2x)$
 - → $x^2 + 10x + 25 = 4(7 + 2x)$ → $x^2 + 10x + 25 = 28 + 8x$
 - → $x^2 + 2x 3 = 0$
 - → $x^2 + 3x x 3 = 0$
 - → (x + 3) (x 1) = 0
 - → X = -3 or x = 1

Possible value of x = 1, -3

Hence, A is the correct option.

Question: 28

I. a² + 11a +30 = 0 II.b²+6b +5 = 0 to solve both the equations to find the values of a and b?

(a) If a < b(b) If $a \le b$ (c) If the relationship between a and b(d) If a > bcannot be established**Answer: b**Solution:

(i) (a+6) (a+5) = 0a = -6, -5(ii) (b+5)(b+1) = 0 $b = -5, -1 => a \le b$

Question: 29A number is equal to 7 times itself minus 18. Which is the number?(a) -3(b) 3(c) 2(d) -2Answer: bSolution:The statement is equivalent to the following equation:X=7x-18x18 = 7x-x6x=18X = 3

Question: 30

If a and b are the roots of the equations $x^2 - 9x + 20 = 0$, find the value of $a^2 + b^2 + ab$ (a) -21 (b) 1 (c) 61 (d) 21 Answer: c. Solution: $a^2 + b^2 + ab = a^2 + b^2 + 2ab - ab$ i.e., $(a + b)^2 - ab$ from $x^2 - 9x + 20 = 0$, we have a + b = 9 and ab = 20. Hence the value of required expression $(9)^2 - 20 = 61$.

Question: 31

If a + b = 29, b + c = 45, a + c = 44. Find a + b + c? (a) -21 (b) 1 (c) 59 (d) 118 Answer: c Solution: (a + b) + (b + c) + (a + c) = 29 + 45 + 44 a + b + b + c + a + c = 118 2a + 2b + 2c = 118 2 (a + b + c) = 118a + b + c = 59

Question: 32 A simple equation in one unknown x is in form ax + b = 0. Is true or not? (b) false (a) true (d) partial (c) not sure Answer: a Solution: A simple equation in one unknown x is in the form ax + b = 0. Where a, b are known constants and a = 0**Ouestion: 33** If both the roots of k $(6x^3 + 3) + rx + 2x^2 - 1 = 0$ and $6k(2x^2 + 1) + px + 4x^2 - 2 = 0$

are common,then 2r – p is equal to	
(a) -1	(b) 0
(c) 1	(d) 2
Answer: b	
Solution:	
The two equations can be written as	
$x^{2}(6k+2) + rx + (3k-1) = 0$	(1)
and $x^2 (12 k + 4) + px + (6k - 2) = 0$	(2)
Divide by 2	
$\therefore x^2 (6k+2) + \frac{P}{2}x + (3k-1) = 0$	(3)
Comparing (1) and (3), we get $r = \frac{P}{2}$	
$\therefore 2r - p = 0.$	

Question: 34

If a root of the equations $x^2 + px + q = 0$ and $x^2 + \alpha x + \beta = 0$ is common then its value will be (where $p \neq \alpha$ and $q \neq \beta$) Condition for common roots is $\frac{12k+4}{6k+2} = \frac{p}{e}$

(a) $\frac{q-\beta}{\alpha-p}$	(b) $\frac{p\beta-\alpha\beta}{q-\beta}$
(c) $\frac{q-\beta}{\alpha-p} - \frac{p\beta-\alpha\beta}{q-\beta}$	(d) None

Answer: b

Solution:

Let the common root be y. Then $y^2 + py + q = 0$ and $y^2 + \alpha y + \beta = 0$ on solving by cross multiplication, we have $\frac{y^2}{p\beta - q\alpha} = \frac{y}{q-\beta} = \frac{1}{\alpha - p} \ y = \frac{q-\beta}{\alpha - p}$ and $\frac{y^2}{y} = y = \frac{p\beta - q\alpha}{q-\beta}$

Question: 35.

If the two equations $x^2 - cx + d = 0$ and $x^2 - ax + b = 0$ have one common root and the second has equal roots then 2(b+d) =

(a) a + c (b) 0 (c) ac (d) -ac **Answer: c** Solution: Given quadratic equations

 $x^2 - cx + d = 0$ (1)

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```
Let \alpha, \beta be the roots of equation (1)

x^2 - ax + b = 0 ..... (2)

Let \alpha, \alpha be the roots of equation (2)

2\alpha = a

\alpha = \frac{a}{2}

Also, \alpha^2 = b

Since, \alpha is a root of (1),

\alpha^2 - c\alpha + d = 0

b + d = \frac{ac}{2}

2(b + d) = ac
```

Question: 36. If $x^2 - hx - 21 = 0$, $x^2 - 3hx + 35 = 0$ (h > 0) has a common root then, the value of h is equal to (a) 1 (b) 2(c) 3 (d) 4 Answer: d Solution: Subtracting we get 2hx = 56 or hx = 28 putting in any, $x^2 - 3(28) + 35 = 0$ $x^2 - 84 + 35 = 0$ $x^2 = 49$ X = 7 hx = 28h = 4

Question:37

If Every pair of the equations $x^2 + px + qr = 0$, $x^2 + qx + rp = 0$, $x^2 + rx + pq = 0$ have a common root. Then the sum of three common roots is

(a) $\frac{-(p+q+r)}{2}$ (b) $\frac{-(p-q+r)}{2}$ (c) - (p+q+r) (d) -p+q+r **Answer: a Solution:** Let the roots be(α , β), (β , λ) and (λ , α) respectively $\alpha + \beta = -p$, $\beta + \lambda = -q$, $\lambda + \alpha = -r$ adding all, we get $\sum \alpha = -(p+q+r)/2$ etc.

Question: 38 If the equation $x^2 + px + q = 0$ and $x^2 + qx + p = 0$, have a common root, then p + q+1 (a) 0 (b) 1 (c) 2 (d) -1 Answer: a Solution: Let α is the common root, so $\alpha^2 + p\alpha + q = 0$ (i) and $\alpha^2 + q\alpha + p = 0$ (ii) From (i) – (ii), \rightarrow (p - q) $\alpha + (q - p$) = 0 $\rightarrow \alpha = 1$ put the value of α in (i), p + q + 1 = 0

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Question: 39 If $x^2 + \alpha x + 10 = 0$ and $x^2 + bx - 10 = 0$ have a common root, then, $a^2 - b^2$ is equal to (a) 10 (b) 20 (c) 30 (d) 40 Answer: d Solution: Let α be a common root, then $\alpha^2 + a\alpha + 10 = 0$ (i) and $\alpha^2 + b\alpha - 10 = 0$?... (ii) form (i) - (ii), (a - b) $\alpha + 20 = 0 \Rightarrow \alpha = -\frac{20}{a-b}$ substituting the value of a (i). We get $\left(-\frac{20}{a-b}\right)^2 + a\left(-\frac{20}{a-b}\right) + 10 = 0 \Rightarrow 400 - 20a (a-b) + 10 (a-b)^2 = 0$ $\Rightarrow 40 - 2a^2 + 2ab + a^2 + b^2 - 2ab = 0 \Rightarrow a^2 - b^2 = 40.$

Question: 40 $x^2 - 11x + a$ and $x^2 - 14x + 2a$ will have a common factor, if a = 42(a) 24 (b) 0, 24 (c) 3, 24 (d) 0, 3 Answer: b Solution: Expression are $x^2 - 11x + a$ and $x^2 - 14x + 2a$ will have a common factor, then $\Rightarrow \frac{x^2}{-22a+14a} = \frac{x}{a-2a} = \frac{1}{-14+11} \Rightarrow \frac{x^2}{-8a} = \frac{1}{-3} \Rightarrow x^2 = \frac{8a}{3}$ and $x = \frac{a}{3}$ $\left(\frac{a}{3}\right)^2 = \frac{8a}{3} \Rightarrow \frac{a^2}{9} = \frac{8a}{3}$ pa = 0, 24. Trick we can check by putting the values of afrom the options.

Question: 41

If x be real, then the minimum value of $x^2 - 8x + 16$ is	
(a) -1	(b) 0
(c) 1	(d) 2
Answer: c	

Solution:

 $[x^2 - 8x + 16]$ since x is real, so $(x - 4)^2$ is always positive and its least value is 0 and so the minimum value of given expression is 1.

Question: 42

Solve the equations $8+2(x-4) = 16$	
(a) -1	(b) 8
(c) 10	(d) 2
Answer: b	

Solution:

First, we removed the parentheses and get 8 + 2(x - 4) = 16, or 8 + 2x - 8 = 16, which gives us 2x=16. We divide by 2 in order to get x = 8.

Question: 43		
Solve the equation: x3 +10 = 2x x3+10 = 2x.		
(a) 6	(b) 8	
(c) 10	(d) 2	

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Answer: a

Solution:

We multiply both sides by 3 to get free of the denominator. This given us x+3-10=3.2x, or x+30=6x by subtracting x from both sides we get 30=5x. Dividing both sides by 5 gives us the answer, x = 6.

Question: 44

2(3x - 7) + 4(3x+2) = 6(5x+9)(a) 6 (c) 10 Answer: b Solution: 2(3x-7)+4(3x+2)=6(5x+9) 6x - 14 + 12x + 8 = 30x + 54 6x + 12x - 30x = 14 - 8 + 54 -12x = 60 $X = 60 \div (-12) X = -5$

(b) -5 (d) 2

Question: 45 Find the solution x to the equations x3-x4=2×3-x4=2. (a) 69 (b) 51 (c) 0 (d) 24 Answer: d

Solution:

We first find the lowest common multiple of 4 and 3. It is 12. Multiplying both sides by 12 gives us $x3 \cdot 12 - x4 \cdot 12 = 2 \cdot 12 \times 3 \cdot 12 - x4 \cdot 12 = 2 \cdot 12$, or $4x \cdot 3x = 24$, which means that x = 24.

Question: 46

A number, multiplied by 5, equals itself minus 48. Which is the number

(a) 6
(c) 0
Answer: d
Solution:
5x = x - 48
4x = -48
X = -12

PAST EXAMINATION QUESTIONS:

(b) -5 (d) -12

<u>MAY 2018</u>

 Question: 1

 The value of K for which the points (k, 1)., (5,5) and (10,7) may be collinear is

 (a) k =-5
 (b) k=7

 (c) k=9
 (d) k=1

 Answer: a

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Solution:

Let $A(x_1, y_1) = (K, 1)$, $B(x_2, y_2) = (5, 5)$, and $\langle p \rangle \langle p \rangle C(x_3, y_3) = (10, 7)$ are three collinear} points Area of triangle ABC = 0 $\frac{1}{2}|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)| = 0$ $|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)| = 0$ $\Rightarrow |k(5-7) + 5(7-1) + 10(1-5)| = 0$ \Rightarrow $|-2k + 5 \times 6 + 10(-4)| = 0$ \Rightarrow |-2k + 30 - 40| = 0 \Rightarrow |-2k+10|=0⇒ -2k = 10 \Rightarrow K = $\frac{10}{-2}$ \Rightarrow K = -5 Therefore, Value of k = -5**Ouestion: 2** If $\alpha + \beta = -2$ and $\alpha\beta = -3$, then α , β are two roots of the equations, which is: (a) $x^2 - 2x - 3 = 0$ (b) $x^2 + 2x - 3 = 0$ (c) $x^2 + 2x + 3 = 0$ (d) $x^2 - 2x + 3 = 0$ **Answer: b** Solution: If $\alpha + \beta = -2$ Q.E. is $X^2 - (\alpha + \beta)x + \alpha$. $\beta = 0$ $X^{2} - (-2)x + (-3) = 0$ $X^2 + 2x - 3 = 0$ **Question: 3** If $2^{x+y} = 2^{2x-y} = \sqrt{8}$, then the respective values of x and y are (b) $\frac{1}{2}$, 1 (a) $1,\frac{1}{2}$ (d) None $(c)\frac{1}{2},\frac{1}{2}$ Answer: a **Solution**: $2^{x+y} = 2^{2x-y} = \sqrt{8}$ $2^{x+y} = \sqrt{8}$ and $2^{2x-y} = \sqrt{8}$ $2^{x+y} = (2^3)^{1/2} 2^{2x-y} = (2^3)^{1/2}$ $2^{x+y} = 2^{3/2}$ $2^{2x-y} = 2^{3/2}$ On Comparing X+ y=3/2 ----- (1) Add: (1) & (2) $X + y = \frac{3}{2}$ ----- (1) $2x-y = \frac{3}{2}$ ----- (2) 3x = 3X = 1

Putting x = 1 in equation (1) $X + y = \frac{3}{2}$ $1 + y = \frac{3}{2}$ $Y=\frac{1}{2}$ X=1, y= $\frac{1}{2}$ **Question: 4** The triangle formed by lines x+2y=3, 2x-y=1 and y=0 is (a) Right angled (b) Equilateral (c) Isosceles (d) None Answer: a Solution: **Given Equation** X+2y=3 -----(1) 2x-y=1 ----- (2) Y=0 ----- (3) Slope of line (1) is $m_1 = \frac{\text{Cofficient of x}}{\text{cofficient of y}} = \frac{-1}{2}$ Slope of line (2) is $m_2 = \frac{\text{cofficient of } x}{\text{cofficient of } y} = \frac{-2}{-1} = 2$ $m_1 \times m_2 = -\frac{1}{2} \times 2$ $m_1 \times m_2 = -1$ Both lines are 1 or to each triangle are also perpendicular. **Question: 5** If $\frac{3}{x+y} + \frac{2}{x-y} = -1$ and $\frac{1}{x+y} - \frac{1}{x-y} = \frac{4}{3}$ then x, y) is: (b) (-1, 2) (a) (2, 1) (c) (1, 2) (d) None Answer: c **Solution**: If $\frac{3}{x+y} + \frac{2}{x-y} = -1$ and $\frac{1}{x+y} - \frac{1}{x-y} = \frac{4}{3}$ By hits and trial (1, 2) satisfied both equation so answer is (1, 2)**Question: 6** If the sides of an equilateral triangle are shortened by 3 units, 4 units and 5 units respectively and a right triangle is formed then the sides of equilateral triangle is: (a) 6 units (b) 7 units (c) 8 units (d) 10units **Answer: c Solution**: Let the side of equilateral triangle is x In △ABC 2.18

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 $(hypo)^2 = (Base)^2 + (per)^2$ $(x - 3)^2 = (x - 4)^2 + (x - 5)^2$ $X^2 + 9 - 6x = x^2 + 16 - 8x + x^2 + 25 - 10x$ $X^2 - 18x + 41 + 6x - 9 = 0$ $X^2 - 12x + 32 = 0$ $X^2 - 8x - 4x + 32 = 0$ X(x-8)-4(x-8) = 0 (x - 8) (x - 4) = 0 X-8=0 if x-4=0 X=8 and x=4 Impossible side of the triangle is 8

Question: 7

IF α , β are the roots of equation $x^2 + x + 5 = 0$ then $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$ is equal to (a) $\frac{16}{5}$ (b) 2 (c) 3 (d) $\frac{14}{5}$

Answer: d

Solution: Given equation: $x^2 + x + 5 = 0$ a=1, b=1, c=5if $\alpha \& \beta$ are root of equation $\alpha + \beta = \frac{-b}{a} = \frac{-1}{1} = -1$ $\alpha\beta = \frac{c}{a} = \frac{5}{1} = 5$ $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha} = \frac{\alpha^3 + \beta^3}{\alpha\beta} = \frac{(\alpha + \beta)^3 - 3\alpha\beta(\alpha + \beta)}{\alpha\beta}$ $\frac{(-1)^3 - 3 \times 5 \times (-1)}{5} = \frac{14}{5}$

<u>NOV 2018</u>

Question: 1

Let α and β be the roots of $x^2 + 7x + 12 = 0$. Then the value of $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$ will be (a) $\frac{7}{12} + \frac{12}{7}$ (b) $\frac{49}{144} + \frac{144}{49}$ (c) $-\frac{91}{21}$ (d) None Answer: c Solution: If $\alpha \& \beta$ are the roots of equation $X^2 + 7x + 12 = 0$ Then $\alpha + \beta = \frac{-b}{a} = \frac{-7}{1} = -7$ $\alpha \times \beta = \frac{c}{a} = \frac{12}{1} = 12$ $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha} = \frac{\alpha^3 + \beta^3}{\alpha\beta}$

 $\frac{(\alpha+\beta)^3 - 3\alpha\beta(\alpha+\beta)}{\alpha\beta} = \frac{(-7)^3 - 3\times 12(-7)}{12}$

 $=\frac{\frac{12}{-91}}{12}$

Question: 2

When two roots of quadratic equation area, $\frac{1}{a}$ then what will be the quadratic equation:

(a) $ax^{2} - (a^{2} + 1) x + a = 0$ (c) $ax^{2} - (a^{2} + 1) x + 1 = 0$ **Answer: a Solution:** If roots of Q.E. are $a, \&\frac{1}{a} \alpha = a, \beta = \frac{1}{a}$ Sum of roots (s) = $\alpha + \beta$ = $a + \frac{1}{a} = 1$ Product of Roots (P) = $\alpha.\beta$ = $a. \frac{1}{a} = 1$ Q.E. is given by $X^{2} - 5x + p = 0$ $X^{2} - [\frac{a^{2} + 1}{a}]x + 1 = 0$ $ax^{2} - (a^{2} + 1)x + a = 0$ (b) $ax^2 - (a^2x + 1) = 0$ (d) None

MAY 2019

Question: 1Find the condition that one roots is double the other of $ax^2 + bx + c = 0$ (a) $2b^2 = 3ac$ (b) $b^2 = 3ac$ (c) $2b^2 = 9ac$ (d) $2b^2 > 9ac$ Answer: cExplanation:Let m be the one root of the given equationThen the other root will be 2m.Then m + 2m=-b/a or, 3m= -b/a or, m=-b/3a.Now, m (2m) = c/a or, (-b/3a)(-2b/3a) = c/a or, 2b^2=9ac.Question: 2 $\begin{pmatrix} x + y & 1 \\ 1 & x - y \end{pmatrix} + \begin{pmatrix} 2 & 3 \\ 2 & -4 \end{pmatrix} = \begin{pmatrix} 12 & 4 \\ 3 & 0 \end{pmatrix}$ then

(a) x = 7 y = -3
 (c) x = -7, y = 3
 Answer: d
 Explanation:
 By option method, Taking D as option

 $\begin{pmatrix} 7+3 & 1\\ 1 & 7-3 \end{pmatrix} + \begin{pmatrix} 2 & 3\\ 2 & -4 \end{pmatrix}$

(b) x = -7, y = -3

(d) x = 7, y = 3

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$\begin{pmatrix} 10 & 1 \\ 1 & 4 \end{pmatrix} + \begin{pmatrix} 2 & 3 \\ 2 & -4 \end{pmatrix} = \begin{pmatrix} 12 & 4 \\ 3 & 0 \end{pmatrix}$		
	NOV 2019	
Question: 1		
Roots of the equation x ³ +9x ² -x-9=0		
(a) 1, 2, 3	(b) 1, -1, -9	
(c) 2, 3, -9	(d) 1, 3, 9	
Answer:(b) Solution:		
$x^3 + 9x^2 - x - 9 = 0$		
By factorization method		
$X^{2}(x+9)-1(x+9) = 0$		
$(x^2 - 1) (x + 9) = 0$		
(x+1)(x-1)(x-9) = 0 (x+1) = 0 $(x-1) = 0$	$[a^2-b^2=(a+b)(a-b)]$ (x+9) = 0	
X = -1 $X = 1$	$\begin{array}{c} (x+y) = 0\\ x = -9 \end{array}$	
Question: 2		
$\frac{2x+5}{10} + \frac{3x+10}{15} = 5$		
(a) 10.58	(b) 9.58	
(c) 9.5	(d) None	
Answer:(b) Solution:		
$\frac{2x+5}{10} + \frac{3x+10}{15} = 5$		
$\frac{10}{15(2x+5)+10(3x+10)} = 5$		
150		
30x + 75 + 30x + 100 = 750 60x = 575		
$X = \frac{575}{62}$		
60		
X = 9.58(approx)		
Question: 3		
Find value of $x^2 - 10x + 1$ if $x = \frac{1}{5 - 2\sqrt{6}}$		
(a) 25	(b) 1	
(c) 0	(d) 49	
Answer:(c) Solution:		
$x^2 - 10x + 1 = 0 =>$ give equation		
$X = \frac{1}{5 - 2\sqrt{6}}$		
5–2v6 Multiplying by conjugate		
$X = \frac{1}{5 - 2\sqrt{6}} \times \frac{5 + 2\sqrt{6}}{5 + 2\sqrt{6}}$		
$5-2\sqrt{6}$ $5+2\sqrt{6}$ $5+2\sqrt{6}$		
$X = \frac{5+2\sqrt{6}}{(5)-(2\sqrt{6})}(a+b)(a-b) = a2 - b2$		
$X = \frac{5 + 2\sqrt{6}}{25 - 24}$		
40-24		
		2,21

 $X = 5+2\sqrt{6}$ $X^{2} = (5+2\sqrt{6}^{2}(a+b)^{2} = a^{2} + b^{2} + 2ab$ $= 25+24+2\times5\times2\sqrt{6}$ $X^{2} = 49+20\sqrt{6} - \dots (1)$ $10x = 10(5+2\sqrt{6}) = 50+20\sqrt{6} - \dots (2)$ $X^{2} - 10x + 1$ $= 49+20\sqrt{6} - 50 - 20\sqrt{6} + 1 \text{ (from equation ---- (1) & (2))}$ = 0So, $x^{2} - 10x + 1 = 0$

Question: 4

Find the value of k in $3x^2 - 2kx + 5 = 0$ If x = 2(a) 15 (b) -7/14 (c) 17/4 (d) - 4/17Answer:(c) **Solution:** $3x^2 - 2kx + 5 = 0$ { give equation } as it is given x = 2Then put in place of $x = 2^{\prime}$ $3 \times (2)^2 - 2k(2) + 5 = 0$ $3 \times 4 - 2k(2) + 5 = 0$ 12 - 4k + 5 = 0-4k = -12 - 5-4k = -17 $K = \frac{17}{4}$

<u>DEC 2020</u>

Ouestion 1 If $2x^2 - (a + 6) 2x + 12a = 0$ then roots are (a) 4 & a2 (b) 6 & a (c) 3 & 2a (d) 6 & 3a **Answer: b Explanation**: Given: $2x^2 - (a + 6)2x + 12a = 0$ \Rightarrow 2x² - 2ax - 12x + 12a = 0 \Rightarrow 2x(x - a) - 12(x - a) = 0 \Rightarrow (2x-12)(x-a) = 0 On equation both the factors with '0' we get $\Rightarrow 2x - 12 = 0 \qquad \Rightarrow x - a = 0$ $\Rightarrow 2x = 12$ \rightarrow x = a $\Rightarrow X = 6$ ∴Two roots are 6 and a : Option B is the correct answer.

<u>Question 2</u> Solving equation 3g² -14g+16=0, we get roots as

(a) 0 (c) 8 and 2/3 Answer: d Explanation: By option d Putting value 2 $3 \times 2^2 - 14(2) + 16 = 0$ 0=0putting value 8/3 $3 \times \left(\frac{8}{3}\right)^2 - 14 \times \frac{8}{3} + 16$ 0=0

Question 3

Solving equations m + m = 6/25 the value of $\sqrt{m} = 6/25$ the value of 'm' works out to works out to:

(d) 1

(b) 1/25

(b) ± 5

(d) 2 and 8/3

(a) 2/25 (c) 3/25 Answer: b Explanation: Correct option is $B \frac{1}{25}$ $m + \sqrt{m} = \frac{6}{25}$ let $m = t^2$ $\therefore t^2 + t = \frac{6}{25}$ $\Rightarrow 25t^2 + 25t - 6 = 0$ $\Rightarrow t = \frac{-25 \pm \sqrt{625 + 4 \times 25 \times 6}}{2 \times 25}$ $t = \frac{-25 \pm \sqrt{1225}}{50}$ $t = \frac{-25 \pm \sqrt{1225}}{50}$ $t = \frac{10}{50}$ and $t = \frac{-60}{50}$ \therefore , $t = \frac{1}{5}$ is correct answer Now, $m = t^2 = \frac{1}{25}$ \therefore , Option B is correct.

JULY 2021

Question 1If α and β are the roots of the equation $2x^2+5x + k = 0$, and $4(\alpha^2 + \beta^2 + \alpha\beta) = 23$, then which ofthe following is true?(a) $k^2+3k-2=0$ (b) $k^2-2k+3=0$ (c) $k^2-2k-3=0$ (d) $k^2-3k+2=0$ Answer: Options (d)

<u>Question 2</u> The cost of 2 oranges and 3 apples is ₹ 28. If the cost of an apple is doubled then the cost of 3

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oranges and 5 apples is ₹ 75. The original cost	of 7 oranges and 4 apples (in ₹) is.		
(a) 59	(b) 47		
(c) 71 Answer: Options (a)	(d) 63		
Aliswer: Options (a)			
Question 3 The value of 'K' is $if 2$ is a root of the fol	$U_{2} = \frac{1}{2} \left(\frac{1}{2} + 1 \right) \times \frac{1}{2} = 0$		
The value of 'K' is, if 2 is a root of the fol (a) 2	(b) 6 (b) 6		
(c) 1	(d) 4		
Answer: Options (b)			
Question 4			
The sum of square of any real positive quantiti (a) 1	ies and its reciprocal is never less than (b) 2		
(a) 1 (c) 3	(d) 4		
Answer: Options (b) Explanation:			
Let the positive real number be a then its reciproc	cal will be $\frac{1}{a}$.		
So using property $AM \ge GM$ we could say that	u		
$\frac{a+\frac{1}{a}}{2} \ge \sqrt{a \times \frac{1}{a}} \operatorname{Or}$			
$\left(a + \frac{1}{a}\right) \ge 2 \times 1$			
Therefore $\left(a + \frac{1}{a}\right) \ge 2$.			
Question 4			
If $A = \begin{bmatrix} 1 & 0 \\ -1 & 1 \end{bmatrix}$ then the value of A^5 is			
	(b) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$		
(a) $\begin{bmatrix} 1 & 0 \\ -1 & 5 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 0 \\ -5 & 1 \end{bmatrix}$	$ \begin{array}{c} (0) & [0 & 1] \\ (d) & \begin{bmatrix} 1 & -5 \\ 0 & 1 \end{bmatrix} \end{array} $		
$\begin{bmatrix} (c) \\ -5 \end{bmatrix}$ Answer: Options (c)			
Aliswer: Options (c)			
	<u>2021</u>		
<u>Question 1</u> If one root is half of the other of a quadratic eq	uation and the difference in roots is a, then the		
equation is			
(a) x^2 + ax + $2a^2 = 0$ (c) x^2 - $3ax + 2a^2 = 0$	(b) $x^2 - 3ax - 2a^2 = 0$ (d) $x^2 + 3ax - 2a^2 = 0$		
Answer:			
Explanation: Let one root be a and another root be $Q^1 \times \alpha = \alpha$	and the left fully a thermost we have p		
Let one root be a, and another root be $\beta_{\frac{1}{2}} \times \alpha = \frac{\alpha}{2}$.			
= } a= g Since the difference of the roots is a, we have $\alpha - \frac{\alpha}{2} = a$	ive:		
6			

$2\alpha - \alpha$
$\frac{1}{2} = a$
$\frac{\alpha}{2} = a$
α=2a
Therefore, $\beta = \frac{\alpha}{2} = \frac{2\alpha}{2} = a$
Sum of roots = $2a x a = 2a^2$
When the roots are known, the equation is given by:
x^2 –(Sum of Roots) × + Product of Roots = 0
Therefore, the equation is:
$x^2 - 3ax + 2a^2 = 0$

Question 2

In a multiple choice question paper consisting of 100 questions of 1 mark each, a candidate gets 60% marks. If the candidate attempted all wrong answer, the difference between number of right answers questions and there was a penalty of 0.25 marks for and wrong answers is:

(a) 32	(b) 36
(c) 40	(d) 38

Answer:

Explanation: Let the number of right answers be x; then the number of wrong answers be 100 - x. Total marks = 60 $(1 \times x) - 0.25 (100 - x) = 60$ = x - (25 - 0.25x) = 60- x - 25 + 0.25X = 60= 1.25x = 60 + 25

= 1.25x = 60= 1.25x = 85

$$r = \frac{85}{-69}$$

 $x = \frac{1}{1.25} = 68$

Therefore, the number of correct answers= 68. Hence, the number of wrong answers = 100 - 68 = 32. Therefore, the difference between the correct answers and wrong answers = 68 - 32 = 36.

Question 3

If the square of a number exceeds twice of the number by 15, then number that satisfies the condition is

(a) -5	(b) 3
(c) 5	(d) 15
Answer: c	
Explanation:	
Let the number be x.	
As per the question, $x^2 - 2x = 15$	
Now, try the options.	
Option (a) = - 5	
LHS = (- 5)2 - 2 (-5) = 25 + 10 = 35 # RHS	
Option (b) = 3	
LHS = $(3)^2 - 2(3) = 9 - 6 = 3 \#$ RHS	

Option (c) = 5LHS = $(5)^2 - 2(5) = 25 - 10 = 15 = RHS$ Therefore, option (c) is the answer. **Question 4** Solve $x^3 - 7x + 6 = 0$ (a) $\times = 6, 7, -4$ (b) x = -1, -2, -3 $(c) \times = 1, 2, -3$ $(d) \times = 2, 4, 6$ **Answer:** Solve $x^3 - 7x + 6 = 0$ $x^3 - x^2 + x^2 - 7x + 6 = 0$ $x - (X - 1) + x^2 - x - 6x + 6 = 0$ $x^{3}(x - 1) + x(x - 1) - 6(\% - 1) = 0$ $(x-1)(x^* + X-6) = 0$ $(x - 1) (x^2 + 3x - 2x - 6) = 0$ $(\times - 1) [x(\times + 3) - 2(\times + 3)] = 0$ $(\times - 1)(x + 3)(x - 2) = 0$ If x-1 = 0 If x+3 = 0 If x-2=0x=1 x=-3 x=2 = 1, 2, -3**IUNE 2022 Ouestion 1** The values of x and y satisfying the equations $\frac{3}{x+y} + \frac{2}{x-y} = 3, \frac{2}{x+y} + \frac{2}{x-y} = 3\frac{2}{3}$ are given by: (b) (-1, -2) (a) (1, 2) (d)(2,1)(c) $(1, \frac{1}{2})$ **Answer: Options (d) Explanation**: Given $\frac{3}{x+y} + \frac{2}{x-y} = 3$ (1) $\frac{2}{x+y} + \frac{3}{x-y} = 3\frac{2}{3}$ (2) **By Hits/Trial** Putting x = 2, y = 1 in equation (1) $\frac{3}{2+1} + \frac{2}{2-1} = 3$ 1 + 2 = 33 = 3 (which is satisfied) and putting x = 2, y = 1 in equation (2) $\frac{\frac{2}{2}}{\frac{2}{2}+\frac{1}{2}+\frac{3}{\frac{2}{2}-\frac{1}{1}}=3\frac{2}{3}}{\frac{2}{3}+\frac{3}{1}=\frac{11}{3}}$ $\frac{11}{3} = \frac{11}{3}$ (which is satisfied)

FOR ENQUIRY – 6262969604 6262969699	
Question 2 If the second root of the given equation is recip	procal of first root then value of 'k' in the
equation $5x^2 - 13x + k = 0$ (a) 3 (c) 1	(b) 2 (d) 5
Answer: Options (d)Explanation:Given Q.E. $5x^2 - 13X + k = 0$ on comparing $ax^2 + bx + c = 0$ We get, $a = 5$, $b = -13$, $c = k$ if one root is reciprocal to otherRoots then $c = a$ $k = 5$	(u) 5
Question 3 A Plumber can be paid, either ₹ 600 and₹ 50 pe hour, for what value of 'n' the method earns be (a) 5 (c) 4	· · · · · · · · · · · · · · · · · · ·
Answer: Options (a) Explanation: Let Plumber takes 'n' hour to complete the jobs Given, $600 + 50 \times n = 170 \times n$ 600 + 50n = 170n 600 = 170 - 50n 600 = 120n $n = \frac{6000}{120}$ n = 5	
Question 4 If a person has cloth of total 91 cm. If he divides shortest one and another part s 3 cm more that (a) 25 (c) 22	
Answer: Options (c) Explanation: Let shortest part = x longest part = 2x other part = (x + 3) Given total length of cloths = 91 x + 2x + (x + 3) = 91 x + 2x + x + 3 = 91 4x + 91 - 3 4x = 88 $x = \frac{88}{4}$ x = 22	

FOR ENQUIRY - 6262969604 6262969699 **DEC 2022 Ouestion 1** What will be the value of k, if the roots of the equation $(k-4)x^2-2kx + (k+5)=0$ are equal? a) 18 b) 20 d) 21 c) 19 **Answer: Options (b) Explanation**: $(k-4)x^2-2kx+(-k+5)$ b²- 4ac $(-2k)^2 - 4(k-4)(k+5) = 0$ Now with option b $(-2 \times 20)^2 - 4(20 - 4)(20 + 5) = 0$ 1600 - 4(16)(25) = 01600 - 1600 = 0= 20 **Ouestion 2** If 2x + 5 > 3x + 2 and 2x - 3 < 4x - 5 the 'x' can take which of the following value? a) 4 b) -4 d) -2 c) 2 **Answer: Options (b) Explanation**: 2x + 5 > 2 + 3x5 - 2 > 3x - 2x3 > x (1)2x - 3 4x - 5 5 - 34x - 2x1x (2) From (1) and (2) x = 1 or 2**Question 3** If the cost of 3 bags and 4 pens is Rs. 257 whereas the cost of 4 bags and 3 pens is Rs. 324, then the cost of one bag is: a) 8 b) 24 c) 32 d) 75 **Answer: Options (d) Explanation**: Let the cost of 1 bag =xAnd the cost of 1 pen =y \Rightarrow 3x+4y=257 \Rightarrow 4x+3y=324 Equation (1) \times 4 : 12x+16y=257×4 Equation (2) \times 3 : 12x+9y=324 \times 3 Subtract two equations: \Rightarrow 7y=56 ⇒y=8 ⇒x=75

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CHAPTER - 3 LINEAR INEQUALITIES

INEQUALITIES	Inequalities are statements where two quantities are unequal but a relationship exists between them. These type of inequalities occur in business whenever there is a limit on supply, demand, sales etc.		
LINEAR INQUALITIES IN ONE VARIABLE AND THE SOLUTION SPACE	Any linear function that involves an inequality sign is a linear Inequality. It may be of one variable or, of more than one variable. simple example of linear inequalities are those of one variable only ; viz., x> 0, x \leq 0 etc.		
	It involves:		
SUMMARY OF GRAPHICAL METHOD	 i. Formulating the linear programming problem, i.e. expressing the objective function and constraints in the standardized format. ii. Plotting the capacity constraints on the graph paper. For this purpose, normally two terminal points are required. This is done by presuming simultaneously that one of the constraints is zero. When constraints concern only one factor, then line will have only one origin point and it will run parallel to the other axis. 		
	Identifying feasible region and coordinates of corner points. Mostly it is done by breading the graph, but a point can be identified by solving simultaneous equation relating to two lines which intersect to form a point on graph.		
	iv. Testing the corner point which gives maximum profit. For this purpose, the coordinates relating to the corner point should put in objectives function and the optimal point should be as certained.		
	v. For decision – making purpose, sometimes, it is required to know whether optimal point leaves some resources unutilized. For this purpose, value of coordinates at the optimal point should be put with constraint to find out which constraints are not fully utilized.		
	vi. Linear inequalities in two variables may be solved easily by extending our knowledge of straight lines.		

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Question 1

On solving the inequalities $6x + y \ge 18$, $x + 4y \ge 12$, $2x + y \le 10$, we get the following situation:

(a) (0, 18), (12, 0), (4, 2), & (7, 6) (c) (5, 0), (0, 10), (4, 2), (7, 6) (b) (3, 0), (0, 3), 0, 0) and (7, 6) (d) (0, 18), (12, 0), (4, 2), (0, 0) and (7, 6)

Answer: a

Explanation:

We draw the graph of 6x+y 218, x+4y 212, and 2x+y 210 in –the same plane. The solution set of system is that portion of the graphs of the given inequality which is represented by the intersection of the above three equations.

Question 2

Solve x + 2 < 4(a) x < 2 (b) x > 2(c) $x \neq 2$ (d) x < 4Answer: a Explanation: We need to subtract 2 from both sides of the inequality. X+2 < 4 X < 4-2X < 2

Question 3

Solve the inequality 3 – $2x \ge 15$ (a) $x \le 6$

(c) x>-6

Answer: b

Explanation:

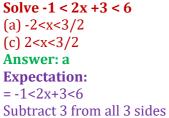
We need to subtract 3 from both sides; then divide both sides by -2 (remembering to change the direction of the inequality).

(b) $x \le -6$

(d) x>6

 $=3-2x \ge 15$ $=-2x \ge 15-3$ $=-2x \ge 12$ $=x \le \frac{12}{-2}$ $=x \le -6$

Question 4



(b) 2<x<23/2 (d) -3<x<23/3

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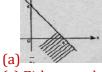
= -1-3<2x+3-3<6-3 = -4<2x<3 Divide all sides by 2 = -2<x<3/2

Question5

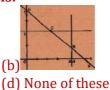
Solve $\frac{x}{2}$ >8 (a) x<8 (c) x=8 **Answer: b Explanation:** $=\frac{x}{2}$ >8 $=x>8\times2$ =x>16

Question 6

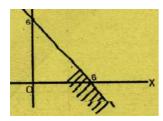
The graph to express the inequality x + y = 56 is:



(c) Either a or b **Answer: a Explanation:** X + y = 56 is graphically represent by



(b) x>16 (d) x=4



<u>Question 7</u> On the average, experienced person does 5 units of work while fresh one 3 units work daily but the employer have to maintain the output to at least 30 units work per day. The situation can be expressed as

(a) 5x - 3y = 30
(c) - 5x + 3y = 30
Answer: b
Explanation:
Let Experience Person x unit work per day
Fresh one = y unit work per day
So situation is 5x + 3y = 30

1011155x + 3y = 30

<u>Question 8</u> Common region of the inequalities is:

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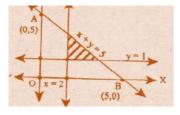
(b) 5x + 3y = 30(d) None of these



(a) BCDB and DEFD
(c) HFGH
Answer: d
Explanation:
Common region of the inequalities is ABDFHKA

Question 9

The shaded region represents:



(a) x + y s 5, x : 1'.2, y :s; 1 (c) x + y s 5, X : 1!4, y : 1; ,1 **Answer: b** (b) x + y: 1'. 5, x : 1 '.2 , y 1 (d) None of these

(b) Unbounded

(d) ABDFHKA

Explanation:

Region represented by the line x + y = 5 touch the coordinate axes at (5, 0) and (0, 5) since the shaded region lies below the line x + y = 5. Hence it is represented by the in equation x + y = 5

Question 10

A company produces two products A and B, each of which requires processing in two machines. The first machine can be used at most for 60 hours, the second machine can be used at most for 40 hours. The product A requires 2 hours on machine one and one hour on machine one and two hours on machine two. Above situation is using linear inequalities?

(a) True	(b) False
(c) Partial	(d) None
Answer: a	

Explanation:

Let the company produce, x number of product A and y number of product B.

As each of product A requires 2 hours in machine one and one hour in machine two, x number of product A requires 2x hours in machine one and x hours in machine two. Similarly, y number of product B requires y hours in machine one and 2y hours in machine two for 40 hours. Hence 2x + y cannot exceed 40. In other words,

(b) False

(d) None

2x + y = 60 and x + 2y = 40

Thus, the conditions can be expressed using linear inequalities.

Question 11

The inequalities $5x_1 + 4x_2 \ge 9$, $x_1 + x_2 \ge 3$, $x_1 \ge 0$ and $x_2 \ge 0$ is correct?

- (a) True
- (c) Not sure
- Answer: a

Explanation:

We draw that straight lines $5 \times 1 + 4 \times 2 = 9$ and $\times 1 + x^2 = 3$.

× 1	0	9/5
× 2	9/4	0
10	1	. (1 1)

Table for $5 \times_1 + 4 \times_2 = 9$	Table for $x_1 + x_2 = 3$		
	×1	0	3
	×2	3	0

Now, if we take the point (4, 4), we find $5 \times 1 + 4 \times 2 * 9$

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i.e., 5.4 + 4.4 * 9or, 36 * 9 (True) $x_1 + x_2 * 3$ i.e., 4 + 4 * 38 * 3 (True) Hence (4, 4) is in the region which satisfies the inequalities

Question 12

Solve the inequality -2(x+3)<10(a) x>-8 (b) x>16 (c) x>8 (d) x>-16 Answer: a Explanation: -2x-6<10-2x-6<10 -2x-6+6<10+6-2x-6+6<10+6 -2x<16-2x<16 -2x-2<16-2-2x-2>16-2x>-8

Question 13

Solve the absolute value inequality $2 3x + 9 < 36$		
(a) -9 <x>3</x>	(b) -9 <x<3< td=""></x<3<>	
(c) 9 <x>3</x>	(d) 9 <x<3< td=""></x<3<>	
Answer: b		
Explanation:		
2 3x + 9 < 362 3x + 9 2 < 36		
3x + 9 < 18		
-18<3x+9		
-18-9<3x		
-27<3x		
-9 <x< td=""><td></td></x<>		

Question 14

Solve x + 2 < 4(a) x < 1 (b) x > 2(c) x > -2 (d) x < 2Answer: d Explanation: We need to subtract 2 from both sides of the inequality. X+2<4 X<4-2X<2

Question 15

Solve $\frac{x}{2}$ >4 (a) x<4 (b) x>8 (c) x>-4 (c) x<2 Answer: b Explanation: We need to multiply both sides of the inequality by 2. $\frac{x}{2}$ >4 x>4×2 x>8

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Question 16

Solve the inequality $\frac{3}{2}(1-x) > \frac{1}{4} - x$ (a) $x < \frac{5}{2}$ (b) x < 5(c) $x < \frac{10}{2}$ (d) $x < \frac{5}{6}$ Answer: a Explanation: $\frac{3}{2}(1-x) > \frac{1}{4} - x$ 6 - 6x > 1 - 4x -6x + 4x > 1 - 6 -2x > -5 $X < \frac{5}{2}$

Question 17

The solution of the inequality 8x + 6 < 12x + 14 is: (a) (-2, 2) (b) (0, -2) (c) (2,) (d) (-2,) Answer: d Explanation: = 8x + 6 < 12x + 14 = 6 - 14 < 12x - 8x = -8 < 4x= x > -2

Question 18

Solve x-1 < 2x + 2 < 3x + 1(a) (x>3 and x>1 (b) (x>-3 and x<1)(c) (x<-3 and x>1 (d) (x>1)Answer: d Explanation: We need to find the intersecting of the "true" values. X -1<2x+2 and 2x+2<3x+1 x<2x+3 and 2x-<3x-1 x>-3 and x>1 The intersection of these 2 regions is x>1.

Question 19

Solve -2(x+4)>1-5x(a) x<3 (b) x>3 (c) $x\neq 3$ (d) x = 3Answer: b Explanation: -2(x+4)>1-5x [-2x -8]1-5x 3x-8>1 3x>9x>3

Question 20 Solve the inequality |2x - 1| > 5

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(a) $x < 3$ (c) $x \neq 3$ Answer: b Explanation: Applying the relations 2x-1<5 or $2x-1>5Solving both inequalit2x<5+1$	-	2x>5+1	(b) x>3 (d) x = 3
2x<-4	or	2x>6	
X<-2	or	x>3	
such that their sum i (a) (7,8),(7,3)and(2,3) (c) (5,7),(7,9)and(2,6) Answer: b Explanation: Let x and x+2 be two c Since both the integer: Also sum of two is less X+x+2<23 =>2x+x<23 Adding -2 to both side 2x<23-2 2x<212 Dividing by 2 on both $\frac{2x}{2} < 23 - 2$ $X < \frac{21}{2}$ X < 10.5 Step 2: Since x is an even position	s less than 23.	n positive ir n 5. X>5x>5 ater than 5	and less than 10.5 × can take value 6,8,10.
Thus the required pair Hence B is the correct		0, 0], (0, 10	J allu (10, 12)
nence b is the correct	answer.		
Question 22 The longest side of a triangle is three times the shortest side and third side is 2cmshortest than the longest side. If the perimeter of the triangle is at least 61cm. find the minimum length of the shortest side.			
(a) 9cm			(b) 3cm
(c) 5cm			(d) None of these
Answer: a			
Explanation:			
Let the length of the sl		x cm	
Length of the largest s			
Length of the third sid			
Since the perimeter of	the triangle is a	at least 61 c	em, we get,
X+3x+3x-2≥61			
7x-2≥61			
Adding 2 on both side	S		
$= > 7x \ge 61 + 2$			
7x≥ 63			
—	For mo	ore Info Visit	t - www.KITest.in

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Dividing both sides by positive number 7 $\frac{7x}{7} \ge \frac{63}{7}$ $X \ge 9$ Step 2: The minimum length of the shortest side is 9 cm. Hence A is the correct answer.

Question 23

Solve the inequality: $2 \le 3x - 4 \le 5$ (a) [2, 8] (b) [4, 5] (c) [3, 4] (d) [2, 3] Answer: d **Explanation**: The given inequality is $2 \le 3x - 4 \le 5$ Adding +4+4 throughout the inequality $2+4 \le 3x - 4 + 4 \le 5 + 4$ $= > 6 \le 3x \le 9$ Dividing by positive number 3 throughout the inequality = > $2 \le x \le 3$ $= > 2 \le x \le 3$ Step 2: Thus all real number, which are greater than or equal to 2, and less than or equal to 3, are solutions to the given inequality. The solution set is [2, 3] Hence D is the correct answer.

Question 24

Graphs of in equations are drawn below:

1111111 L1: 5x+3y=30 L2: x + y = 9L3: Y = X/3L4: y = x/2The common region (Shaded part) shown in the diagram refers to the inequalities (a) $5x+3y \le 30$ (b) $5x + 3y \ge 30$ $X + y \le 9$ $x + y \le 9$ $Y \le 1/2x$ $y \ge x/3$ $y \le x/2$ $y \le x/2$ $x \ge 0, y \ge 0$ $x \ge 0, y \ge 0$ (c) $5x+3y \ge 9$ (d) None of these $X + y \ge 9$ $Y \le x/3$ $y \ge x/2$ $x \ge 0, y \ge 0$ Answer: d **Explanation**: 5x + 3y > 30X + y < 9Y > 9 $Y \le x/2$ $X \ge 0; y \ge 0$

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PAST EXAMINATION QUESTIONS:

<u>MAY 2018</u>

Question 1

The linear relationship between are variable in an inequality:

(a) <u>ax+by≤c</u>

(b) $\underline{ax.by \leq c}$ (d) $\underline{ax+bxy \leq c}$

(c) <u>axy+by≤c</u> Answer: a

The linear relationship between two variables in an inequality ax+by≤c

<u>NOV 2018</u>

Question 1

On solving the inequalities $5x+y \le 100$, $x+y \le 60$, $x \ge 0$, $y \ge$, we get the following solutions:(a) (0,0), (20,0), (10,50), & (0,60)(b) (0,0), (60,0), (10,50) & (0,60)

(c) (0,0), (20,0), (0,100), & (10,50)

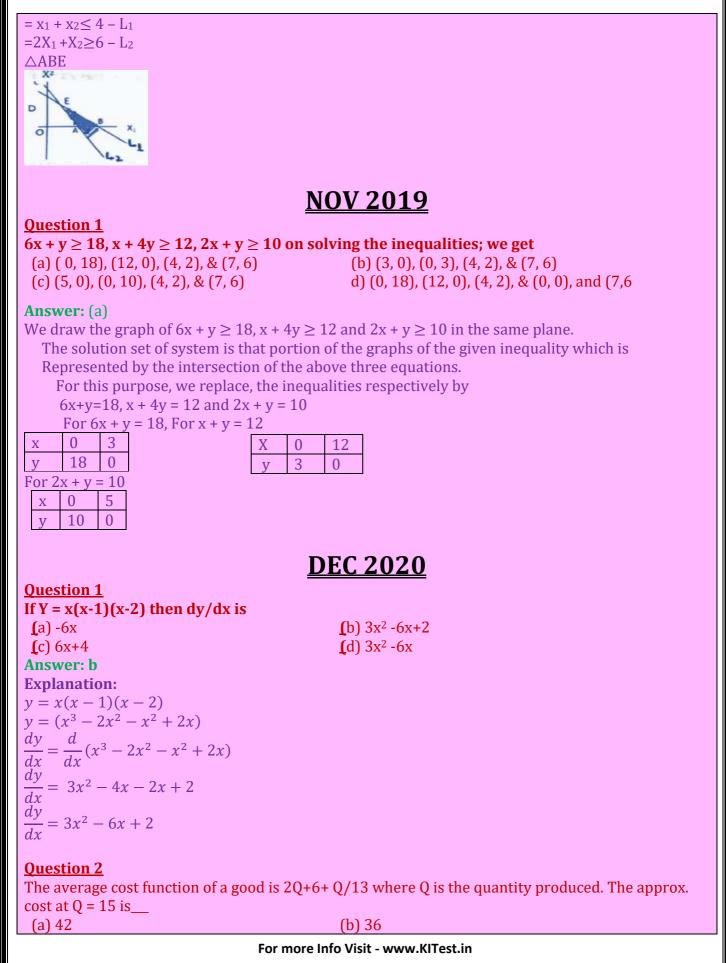
(b) (0,0), (60,0), (10,50 (d) None

Answer: a Explanation:

On solving the inequalities $5x+y \le 100$, $x+y \le 60$, $x+y \le 60$, $x\ge 0$, $y\ge$, we get (0, 0), (20, 0) (10, 50) & (0, 60) all satisfied above inequalities

<u>MAY 2019</u>

The solution set of the in equation	x + 2 > 0 and $2x - 6 > 0$ is
(a) (-2, ∞)	(b) (3,∞)
(c) (-∞, -2)	(d) (-∞, -3)
Answer: b	
Explanation:	
X + 2 > 0	
	2X - 6 > 0
X > -2	2X > 6
v s ⁶	$\Delta \Lambda \ge 0$
$X > \frac{6}{2}$	
X > 3	
X € (3,∞)	
<u>Questions 2</u> The common region represented	X2 D B B
I V V ZAI OV VSZ	
$L_1 = X_1 + X_2 \le 4; L_2 = 2X_1 + X_2 \ge 6$	
(a) OABC	(b) Outside of OAB
(c) \triangle BCE	(d) \triangle ABE
Answer: d	
Explanation:	
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(c) 66

Answer: d

Explanation

Note: According to the given question the correct answers is Rs.553. There is no correct

<u>IAN 2021</u>

Ouestion 1

The common region in the graph of the inequalities $x + y \le 4$, $x - y \le 4$, $x \ge 2$, *is*. (a) equilateral triangle (b) Isosceles triangle

- (c) Quadrilateral

(d) Square

(d) None of these

Answer: b

Explanation:

common region in the graph of the inequalities $x + y \le 4$, $x - y \le 4$, $x \ge 2$, *is* it made isosceles triangle

Question 2

If A + B = $\begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$ and A - 2B = $\begin{bmatrix} -1 & 1 \\ 0 & -1 \end{bmatrix}$, then A =
(a) $\begin{bmatrix} 1 & 1 \\ 2 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} 2/3 & 1/3 \\ 1/3 & 2/3 \end{bmatrix}$
(c) $\begin{bmatrix} 1/3 & 1/3 \\ 2/3 & 1/3 \end{bmatrix}$ (d) $\begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$
Answer: c
Explanation:
$2(a+b) = 2\begin{bmatrix} 1 & 0\\ 1 & 1 \end{bmatrix} = 2A + 2B = \begin{bmatrix} 2 & 0\\ 2 & 2 \end{bmatrix} (1)$
$A - 2B = \begin{bmatrix} -1 & 1 \\ 0 & -1 \end{bmatrix}(2)$
$2A + 2B + A - 2B = \begin{bmatrix} 2 & 0 \\ 2 & 2 \end{bmatrix} + \begin{bmatrix} -1 & 1 \\ 0 & -1 \end{bmatrix}$
$3A = \begin{bmatrix} 1 & 1 \\ 2 & 1 \end{bmatrix}$
$A = \frac{1}{3} \begin{bmatrix} 1 & 1 \\ 2 & 1 \end{bmatrix}$
Hence answer will be = $\begin{bmatrix} 1/3 & 1/3 \\ 2/3 & 1/3 \end{bmatrix}$
[2/3 1/3]
Question 3
$\begin{bmatrix} 1 & -2 & 3 \end{bmatrix}$
The matrix $A = \begin{bmatrix} 1 & -2 & 3 \\ 1 & -3 & 4 \\ -1 & 1 & -2 \end{bmatrix}$ is
$[-1 \ 1 \ -2]$

- (a) Symmetric
- (c) Singular

(b) Skew – symmetric (d) Non – Singular

Answer: c **Explanation**:

A singular matrix is one which is non-invertible i.e. there is no multiplicative inverse, B, such that the original matrix A × B = I (Identity matrix) A matrix is singular if and only if its determinant is zero.

Ouestion 4

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The cost function of production is given by $C(x) = \frac{x^3}{2} - 15x^2 + 36x$ where x denotes thee number of items produced. The level of output for which marginal cost is minimum and the level of output for which the average cost is minimum are given by, respectively (a) 10 and 15 (b) 10 and 12

(d) 15 and 10

(b) e(e - 1)

(d) $e^2(e-1)$

(a) 10 and 15 (c) 12 and 15 Answer: a

Question 5

 $\int_{1}^{0} e^{x} \left(\frac{1}{x} - \frac{1}{x^{2}}\right) dx =$ (a) $e\left(\frac{e}{2} - 2\right)$ (c) a **Answer: a**

JULY 2021

<u>Question 1</u>	
If y = 4+9 sin 5x then which holds good?	
(a) $-5 \le y \le 13$	(b) $-4 \le y \le 8$
(c) $0 < y < 1$	(d) -5 < y < 5
Answer: Options (a)	

DEC 2021

Question 1

Xyz Company has a policy for its recruitment as: it should not recruit more than eight men (x) to three women(y). How can this fact to be express in inequality?

(a) $3y \ge 8x$ (b) $3y \le x/8$ (c) $8y \ge 3x$ (d) $8y \le 3x$ **Answer: c Explanation**: As per the company's policy, When $y=3, x \le 8$ It can also be written as: When $\frac{y}{3} = 1$ ----- Eq (1) $\frac{x}{8} \le 1$ Eq (2) Now, as per Eq 1, we have $\frac{y}{z} = 1$ It can also be written as $1=\frac{y}{3}$... Eq 3 Substituting the value of $1 = \frac{y}{3}$ from eq (3) to Eq(2), we'll get: $\frac{x}{8} \le \frac{y}{3}$ $3x \le 8y$ $8y \ge 3x$

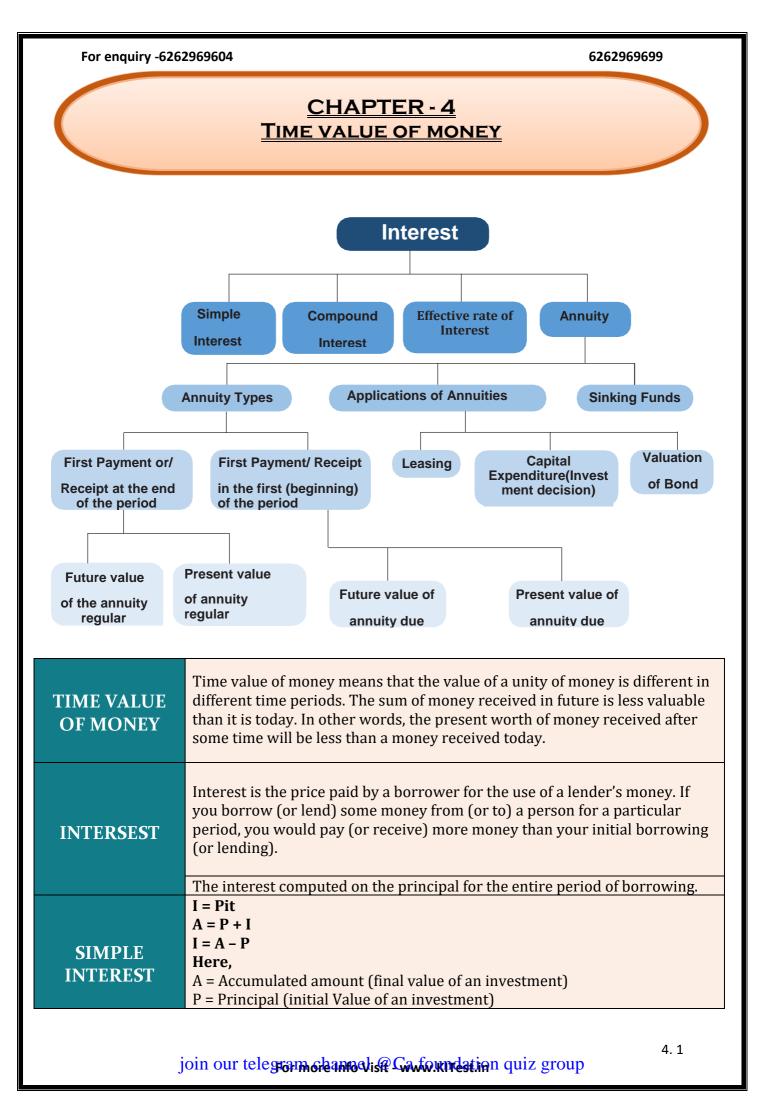
<u>DEC 2022</u>

Question 1

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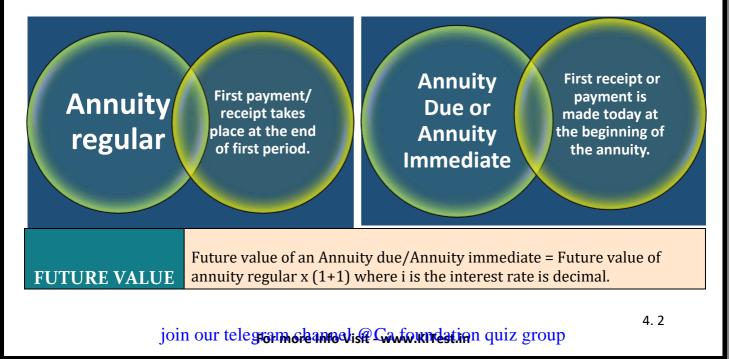
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The		utior (2, -3		ne following system of linear equations 2x-5y+4=0 and 2x b) (1, -3)	x+y-8 = 0 will be
		(2, 2)		d) (-2, 2)	
And)	uj (-2, 2)	
Exp 2x- 2x+ Isol 2x- 0r 2	5y+4 2x=5y 5y-4	tion	.(1) .(2) n equ	ation (1) and find the value of x and y.	
y:	0	2	4		
Similarly, isolate x from equation (2) and find the values of x and y. 2x+y-8=0 or $y=8-2x$ x: 1 2 3 y: 6 4 2 Graph: Both the lines intersect each other at point (3,2). So, x=3,y=2					

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	i = Annual interest rate in decimal. I = Amount of interest t = Time in years
COMPOUND INTEREST	The interest that accrues when earnings for each specified period of time added to the principal thus increasing the principal base on which subsequent interest is computed. Formula for compound interest: $A_n = P (1+i)^n$ Where, i = Annual rate of interest n = Number of conversion periods per year Interest = $A_n - P = P (1 + i)^n - P$ n is total conversions i.e. t x no. of conversions per year
EFFECTIVE RATE OF INTEREST	The effective interest rate can be computed directly by following formula: $E = (1 + i)^n - P$ Where E is the effective interest rate i = actual interest rate in decimal n = number of conversation period
FUTURE VALUE	Future value of a single cash flow can be computed by above formula. Replace A by future value (F) and P by single cash flow (C.F.) therefore $F = C.F. (1 + i)^n$
ANNUITY	Annuity can be defined as a sequence of periodic payments (or receipts) regularly over a specified period of time.

TYPES OF ANNUITY



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OF AN ANNUITY DUE/ANNUITY IMMEDIATE	The present value P of the amount an due at the end of n period at the rate of i per interest period may be obtained by solving for P the below given equation $A_n = P(1 + i)^n$	
PRESENT VALUE OF ANNUITY DUE OR ANNUITY IMMEDIATE	 Present value of annuity due/immediate for n years is the same as an annuity regular for (n-1) years plus an initial receipt or payment in beginning of the period. Calculating the present value of annuity due involves two steps. Step 1: Compute the present value of annuity as if it were an annuity regular for one period short. Step 2: Add initial cash payment/ receipt to the step 1 value. 	
SINKING FUND	It is the fund credited for a specified purpose by way of sequence of periodic payments over a time period at a specified interest rate. Interest is compounded at the end of every period. Size of the sinking fund deposit is computed from A = P.A(n, i) Where A is the amount to be saved the periodic payment, in the payment period.	
ANNUITY APPLICATIONS	Leasing Capital Expenditure Valuation of bond	Leasing is a financial arrangement under which the owner of the asset (lessor) allows the user of the asset (lessee) to use the asset for a defined period of time (lease period) for a consideration (lease rental) payable over a given period of time. This is a kind of taking an asset on rent Capital expenditure means purchasing on asset (which results in outflows of money) today in anticipation of benefits (cash inflow) which would flow across the life of the investment A bond is a debt security in which the issuer owes the holder a debt and is obliged to repay the principal and interest. Bonds are generally issued for a fixed term longer than one year.



Question 1

How much interest will be earned on '2000 at 6 % simple interest for 2 years? (a) 250 (b) 240

(d) 270

(a) 230 (c) 260 **Answer: b Explanation:** Required interest amount is given by $I = P \times i \times t$ $= 2000 \times \frac{6}{100} \times 2$ = 240

Question 2

Sonata deposited 50,000 in a bank for two years with the interest rate of 5.5% p.a. how much interest would she earn?

(a) 550 (b) 55000 (c) 55 ` (d) 5500 **Answer: d Explanation:** Required interest amount is given by $I = P \times i \times t$ $50000 \times \frac{5.5}{100} \times 2$ = 5500

Ouestion 3 Sachin deposited 1, 00,000 in is bank for 2 years at simple interest rate of 6%. How much interest would he earn? How much would be the final value of deposit? (b) 1,12,000 (a) 11200 (c) 124000 (d) 12400 **Answer: b Explanation**: i. required interest amount is given by $I = P \times it$ $100000 \times \frac{6}{100} \times 2$ = 12.000ii. Final value of deposit is given by = A = P + I=(1,00,000+12,000)= 1, 12,000

Question 4

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Rohika invested 70,000 in a bank at the rate of 6.5% p.a. simple interest rate. He received 85,925 after the end of term. Find out the period for which sum was invested by Rahul.

(a) 3.5 years (c) 0.35 years **Answer: a Explanation:** We know A = P (1 + it) I.e. 85925 = 70000(1+ $\frac{6.5}{100} \times t$) $\frac{85925}{70000} = \frac{100+6.5t}{100}$ $\frac{85925 \times 100}{70000} -100 = 6.5t$ 22.75 = 6.5t t = 3.5 = time = 3.5 years

(b) 35 years (d) 36 years

Question5

Kanti Devi deposited some amount in a bank for 7 ½ years at the rate of 6% p.a. simple interest. Kanti Devi received '1, 01,500 at the end of the term. Compute initial deposit of kanti Devi initial deposit of kanti Devi

(b) 7000 (d) 700000

(a) 70000 (c) 70 Answer: a Explanation: We know, A = P(1+it)i.e. $101500 = P(1 + \frac{6}{100} \times \frac{15}{2})$ $1, 01,500 = P[1 + \frac{45}{100}]$ $P = \frac{101500 \times 100}{145}$ = 70,000Initial deposit of kanti Devi = 70,000

Question 6

Shila has a sum of 46,875 was lent out at simple interest at the end of 1 year 8 months the total amount was 50,000. Find the rate of interest percent per annum. (a) 0.4% (b) 4%(c) 40% (d) 0.04%Answer: b Explanation: We know A = P (1 + it) i.e.50, 000 = $46875(1 + i \times 1\frac{8}{12})$ i = 0.04; Rate = 4%

Question 7What sum money will produce Heena 28,600 as an interest in 3 years and 3months at 2.5% p.a. simple interest?(a) 35200(b) 352000

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(c) 32500 (d) 325000 Answer: b Explanation: We know I = P × i × t i.e. 28,600 = P × $\frac{2.5}{100}$ × $3\frac{3}{12}$ 28600 = $\frac{2.5}{100}$ p × $\frac{13}{4}$ 28600 = $\frac{32.5}{400}$ p P = $\frac{28600 \times 400}{32.5}$ =352000 3, 52,000 will produce 28,600 interests in 3 years and 3 months at 2.5% p.a. simple interest.

Ouestion 8

In what time vansh will do 85,000 amount to 1, 57,675 at 4.5% p.a.? (a) 9 years (b) 91 years (c) 19 years (d) 1 year Answer: c Explanation: We know A = P (1 + it) $157675 = 85000(1 + \frac{4.5}{100} \times t)$ $\frac{157675}{85000} = \frac{100 + 4.5t}{100}$ $4.5t = (\frac{157675}{85000} \times 100) - 100$ $t = \frac{85.5}{4.5} = t = 19$ In 19 years 85,000 will amount to 1, 57,675 at 4.5% p.a. simple interest rate.

Question 9

A sum of money doubles itself in 10 years. The number of years it would triple itself is:

(a) 25 years (b) 20 years (c) 15 years Answer: b Explanation: Let the sum of money invested be P. Then, amount = 2P A = P (1+it) $2p = p (1 + r \times \frac{10}{100})$ $2 = \frac{100+10r}{100}$ 10r=100R=10%p.a. Now, year be 20 years

Question 10

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A company establishes a sinking fund to provide for the payment of 2, 00,000 debt maturing in 20 years. Contribution to the fund is to be made at the end of every year. Find the amount of each annual deposit if interest is 5% per annum.

(b) 6049

(d) 6159

(a) 6142 (c) 6052 Answer: b Explanation: Let the annual deposit be A F.Y. =0 [(1 +i) -1]ⁿ 2, 00,000 = [(1+0.05)²⁰ - 1] 10,000 = a (1.6533) A = $\frac{10000}{1.6533}$ A = 6049

Question 11

Ouestion 12

A machine worth 4, 90,740 is depreciated at 15% on its opening value each year. When its value would reduce to 2, 00,000:

(a) 5 years 6 months (c) 5 years 5 months **Answer: a Explanation:** Amount = 2, 00,000 In case of depreciation A = P $(1 - i)^t$ 2, 00,000 = 4, 90,740 $(1 - 0.15)^t$ 0.4075 = $(0.85)^t$ $(0.85)^{.5.5} = (0.85)^t$ n = 5.5 or 5 years 6 months (approx.) (b) 5 years 7 months (d) None

A sum amount to 1,331 at a principal of 1,000 at 10% compounded annually; Find the time. (a) 3.31 years (b) 4 years (c) 3 years (d) 2 years Answer: c Explanation: P = 1,000 A = 1,331 i = 0.10 Time = n years

A = P (1+i)^t 1331 = 1000 (1 + 0.10)^t 1.331 = (1.10)^t (1.10)³ = (1.10)^t n = 3 Therefore, Rs. 1,000 amounts to 1,331 at 10% p.a. C.I. in 3 year's

Question 13

If a sum triples in 15 years at simple rate of interest, the rate of interest per annum will be

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(b)	13.33%
(d)	13.66%

(a) 13.0% (c) 1.33% **Answer: b Explanation**: Let Principal P = PAmount A = 3PT = 15 years S.I. = A-P= 3P - P= 2P $R = \frac{S.I.\times 100}{100}$ P×T $R = \frac{\frac{r \times T}{2P \times 100}}{r}$ $P \times 15$ Yrs. $R = \frac{\frac{40}{3}}{3}$ = 13.33%

Question 14

In what time will a sum of money double its y at 6.25 Simple interest? (a) 5 years (b) 12 years (c) 8 years (d) 16 years Answer: d **Explanation**: Let $R = \frac{625}{100}$. According to the question, Amount = 2 (Principle) A = 2PS.I. = A - P= 2P – P = P S.I. = $\frac{P \times R \times T}{100}$ $P = \frac{P \times 625 \times T}{P}$ $P = \frac{100 \times 100}{p \times 100 \times 100}$ $T = \frac{p \times 625}{p \times 625}$ T = 16 Years

Question 15

What principal will amount to 370 in 6 years at 8% p.a. at simple interest? (a) 210 (b) 250 (c) 260 (d) 25 Answer: b Explanation: Given Amount (A) = 370, T = 6 yrs, R = 8% p.a. Let P = x SI = $\frac{PRT}{100}$ $= \frac{8 \times 6 \times X}{100}$ S.I. = $\frac{48X}{100}$ A = P+S.I.

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 $A = X + \frac{48X}{100}$ $370 = \frac{148X}{100}$ $X = \frac{370 \times 100}{148}$ = 250

Question 16

2,000 is invested at annual rate o interest of 10%. What is the amount after two years if compounding is quarterly?

(a) 2420 (c) 2436.80 **Answer: c Explanation:** $n = 4 \times 2 = 8$ $i = \frac{0.1}{4} = 0.025$ $A_8 = 2,000 (1+0.025)^8$ $= 2,000 \times 1.2184$ = 2,436.80

(b) 2431 (d) 2440.58

Question 17

Determine the compound amount and compound interest on 1000 at 6% compounded semi-annually for 6 years. Given that (1+i) n = 1.42576 for i = 3% and n = 2(a) 425.76 (b) 425.67 (c) 851.52 (d) 851.25 Answer: a Solution: Given: Principal, P = Rs. 1,000Rate of Interest = 6%Time, = 6 years And $(1 + i)^n = 1.42576$ for i = 3% and n = 12 We k now compound amount, $A = P (1 + i)^n$ Since, the interest is compounded semi-annually for 6 years Here, $i = \frac{6}{2}\% = 3\%$ and $n = 6 \times 2 = 12$

Compound Amount

$$\mathbf{A} = \mathbf{P}(1+i)^n$$

- = Rs. 1,000 (1 + 3%)¹²
- = Rs. 1,000 × 1.42576
- = Rs. 1,425.76

Compound Interest = Rs. (1,425.76 – 1,000)

= Rs. 425.76

Question 18

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2000 is invested at annual rate of interest of 10%. What is the amount after two years if compounding is done monthly?

(a) 2420 (c) 2436.80 Answer: d Explanation: $A_n = P (1 + i)^n$ $n = 12 \times 2 = 24, i = 0.1/12 = 0.00833$ $A_{24} = 2,00 (1 + 0.00833)^{24}$ $= 2.00 \times 1.22029$ = 2.44.058 (b) 2431 (d) 244.058

Ouestion 19 Which is a better investment 3% per year compounded monthly or 3.2% per year simple interest? Given that $(1+0.0025)^{12} = 1.0304$ (a) 3.04% (b) 3.4% (c) 3.004% (d) 4.03% Answer: a **Explanation**: i= 3/12 =0.25% = 0.0025 n=12 $E = (1+i)^n - 1$ $=(1+00025)^{12}-1$ = 1.0304 - 1 = 0.0304= 3.04%Effective rate of interest (E) being less than 3.2%. The simple interest 3.2% per year is the better investment.

Question 20

Bichara invest 3000 in a two-year investment that pays you 12% per annum. Calculate the future value of the investment.

(a) 3,763.20	(b) 376.320
(c) 37632.00	(d) 37.6320
Answer: a	
Explanation:	
We know $F = C.F. (1 + i)^{n}$	
Where F = Future value	
C.F. = Cash flow = 3,000	
i = rate of interest = 0.12	
n= time period = 2	
$F = 3,000(1+0.12)^2$	
= 3,000 × 1.2544	

= 3,763.20

Question 21As certain the compound value and compound interest of an amount of '75,000 at8 percent compounded semiannually for 5 years.(a) 30615(b) 36051(c) 36501(d) 36015

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Answer: d

Explanation: Computation of compound value and compound interest Semiannual rate of interest (i) = 8/2 = 4%n = 5 × 2 = 10, P = 75,000 Compound value = P (1+i) ⁿ = 75,000(1+4 %) ¹⁰ = 75,000 × 1.4802 = 1, 11,015 Compound interest = 1, 11,015 – 75,000 = 36,015.

Question 22

A doctor is planning to buy an X – Ray machine for his hospital. He has two options. He can either purchase it by making cash payment of 5 lakhs or 6'15,000 are to be paid in six equal annual installments. Which option do you suggest to the doctor assuming the rate of return is 12 percent? Present value of annuity of Rs. 1 at 12 percent rate of discount for six years is 4.111

(a) 421378 (b) 412378(c) 487321 (d) 421387**Answer: a Explanation:** Option I: Cash down payment = 5, 00,000 Option II: Annual installment Basis Annual installment = $615000 \times \frac{1}{6} = 102500$ Present value of 1 to 6 installments @ 12%= 1, 02,500 × 4.111 = 4, 21,378

Question 23

Calculate if '10,000 is invested at interest rate of 12% per annum, what is the amount after 3 years if the compounding of interest is done half yearly? (a) 14049.28 (b) 14185.19 (c) 14857.61 (d) 14094.28 Answer: b Explanation: $10,000 \left[1 + \frac{12}{100 \times 2}\right]^{3 \times 2}$ $10,000 (1 + 0.06)^{6}$ = 10,000 × 1.418519 = 14,185.19

Question 24	
Present value " is the current value (of a "Future Amount". The statement is
correct or not?	
(a) Correct	(b) incorrect
(c) Not sure	(d) None
Answer: a	

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Explanation:

Present value "is the current value of a "Future Amount". It can also be defined as the amount to be invested today (present value) at a given rate over specified period to equal the "Future Amount".

Question 25

Simple interest may be defined as interest that is calculated as a simple percentage of the restricted amount is true or false?

(a) True	(b) False
(c) Partial	(d) None
Answer: b	

Explanation:

Simple interest may be defined as interest that is calculated as a simple percentage of the original principal amount.

Ouestion 26

Time value of money indicates that

(a) A unit of money obtained today is worth more than a unit of money obtained in future (c) There is no difference in the value of money obtained today and tomorrow Answer: a

(b) A unit of money obtained today is worth less than a unit of money obtained in obtained in future (d) None of these

Ouestion 27

Explanation:

Time value of money supports the comparison of cash flows recorded at different time period by

A unit of money obtained today is worth more than a unit of money obtained in future.

(a) Discounting all cash flows to a common (b) Compounding all cash flows to a point of time (c) Using either a or b

common point of time (d) None of the above

Answer: c

Explanation:

Time value of money supports the comparison of cash flows recorded at, different time period by discounting and compounding all cash flows to a common point of time.

Question 28

Accounting financial management \rightarrow liquidity decisions		
(a) True	(b) False	
(c) Partial	(d) None	
Answer: b		
Explanation:		
False		
It should be \rightarrow the controller's responsibility	ities are primarily – in nature, while	
treasure's responsibilities are primarily re	lated to this.	

Ouestion 29

the

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Richa borrowed a sum of Rs. 4800 from Ankita as a loan. She promised Ankita that she will pay it back in two equal installments. If the rate of interest be 5% per annum compounded annually, find the amount of each installment.

(a) 14049.28 (b) 2581.46 (c) 24857.61 (d) 14094.28 Answer: b **Explanation**: Given that principal value = 4800 Rate = 5%Two equal installments annually = 2 years Applying the formula, $P = X / (1 + r / 100)^n$ X/ (1+r / 100) So, we have here two equal installments. $P=X/(1+r/100)^2 + X/(1+r/100)$ $4800=X/(1+5/100)^2 + X/(1+5/100)$ On simplifying We have x= Rs. 2581.46 So, the amount of each installment is Rs. 2581.46

Question 30

A builder borrows Rs. 2550 to be paid back with compound interest at the rate of 4% per annum by the end of 2 years in two equal yearly installments. How much will each installment be?

(a) Rs. 1352 (b) Rs. 1377
(c) Rs. 1275 (d) Rs. 1283
Answer: a	
Explanation:	
Amount = Rs. 2550	
Rate = 4% per annum	
Time = 2 years	
Applying the formula	
$P = X/(1+r/100)^{n+}$ X/(1+r/100)	
Here we have two equal installments, so	
1	

 $P = \frac{1}{\left|1 + \frac{r}{100}\right|^2} + \frac{x}{\left|1 + \frac{4}{100}\right|}$ = Rs. 1352

Question 31

A man buys a scooter on making a cash down payment of Rs. 16224 and promises to pay two more yearly installment of equivalent amount in next two years. If the rate of interest is 4% per annum, compounded yearly, the cash value of the scooter, is

(a) Rs. 40000 (c) Rs. 46000

(b) Rs. 46824 (d) Rs. 50000

Answer: b

Explanation:

Concept used in this question is: you need to calculate principal for every year unlike simple interest where principal used to be same for every year.

Let principal (present worth) for first year be P_1 and that for two years be P_2

 $16224 = P_1 \left[1 + \frac{4}{100} \right]$

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 $P_1 = \frac{16224 \times 25}{26} = \text{Rs. 15600}$

Again, 16224 = $P_2 \left[1 + \frac{4}{100}\right]^2$ $P_2 = \frac{16224 \times 625}{676} = Rs. 15000$

The total payment will be (cash down payment + installment paid) Cash value of the scooter = Rs. (16224 + 15600 + 15000) = Rs. 46824.

Question 32

The populations of Chandigarh is increase at a rate of 1% for first year, it decrease at the rate of 4% for the second year and for third year it again increase at the rate of 5%. Then what will be the population of Chandigarh are 50000.

(a) Rs. 51006 (c) Rs. 50836 (b) Rs. 50904 (d) Rs. 51125

Answer: b

Explanation:

Since the rate growth of population is increasing first and then decreasing for the second year and again it increases for third year, then the population after T years will be

 $50,000 \times \left[1 + \frac{1}{100}\right]^1 \times \left[1 - \frac{4}{100}\right]^1 \times \left[1 + \frac{5}{100}\right]^1 = 50904$

Question 33

A person bought a new machine. The value of the machine is Rs. 10000. If rate of depreciation is 5 % per annum, then what will be the value of the machine after 2 years?

(a) Rs. 9025 (b) Rs. 9044 (c) Rs. 9110 (d) Rs. 9080 **Answer: a Explanation:** Here P = Rs. 10000 Rate of depreciation = 5% T = 2 years Therefore, the value after 2 years will be = P $(1 - R/100)^{t}$ = 10,000 $\left[1 - \frac{5}{100}\right]^{2}$ = Rs. 9025.

Question 34

A sum of Rs. 6600 was taken as a loan. This is to be repaid in two equal annual installments. If the rate of interest be 20% compounded annually then the value of each installment is

(a) Rs. 4320 (b) Rs.4400 (c) Rs. 2220 (d) Rs. 4420 Answer: a Explanation: Present worth of Rs. X due T years hence is given by Present worth (PW) = $\frac{X}{\left(1+\frac{R}{100}\right)^2}$ = 6600

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 $\frac{\frac{X}{\left(\frac{6}{5}\right)} + \frac{X}{\left(\frac{6}{5}\right)^2} = 6600}{\frac{5X}{6} + \frac{25X}{36} = 6600}$ $\frac{\frac{55X}{36}}{36} = 6600.$ $X = \frac{6600 \times 36}{55} = 4320$

Question 35

Simple interest on a sum at 5% per annum for 2 years is Rs. 60. The compound interest on the same sum for the same period is

Rs. 61.5 Rs. 60.5

(a) Rs. 62.4	(b)
(c) Rs. 62	(d)
Answer: b	
Explanation:	
$Principal = \frac{100 \times SI}{RT} = Rs. 600$	
Compound interest = $P(1 + \frac{R}{100})^T - P$	
$= 600 \left(1 + \frac{5}{100}\right)^2 - 600$	
= 661.5 – 600 = Rs. 61.5	

Question 36

What will be the amount if a sum of Rs. 10000 is placed at compound interest for 3 year while rate of interest for the first, second and third years is 2, 5 and 10 percent, respectively?

(a) 11781	(b) 11244
(c) 11231	(d) 11658

Answer: a Explanation:

When rates are different for different years, say R_1 %, R_2 % and R_3 % FOR 1ST, 2ND and 3rd year respectively.

 $A = P\left(1 + \frac{R_1}{100}\right)\left(1 + \frac{R_2}{100}\right)\left(1 + \frac{R_3}{100}\right)$ Amount after 3 years = 10000 $\left(1 + \frac{2}{100}\right)\left(1 + \frac{5}{100}\right)\left(1 + \frac{10}{100}\right)$ = 10000 $\left(\frac{102}{100}\right)\left(\frac{105}{100}\right)\left(\frac{110}{100}\right)$ $\frac{102 \times 105 \times 11 \times 100}{100}$ = Rs. 11781

Question 37

An electronic type writer worth Rs. 12000 deprecates @ 10% P.A. ultimately it was sold for Rs. 200. Estimate its effective life during which it was in use? (a) 389 (b) 38.9 (c) 3.89 (d) None Answer: b Explanation: $200=12000 \times (90/100) ^n$ $1/60 = (9/10) ^n$ Apply log both sides, we get $Log (1/60) = n \times log (9/10)$

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 $-1.7781 = n \times -0.0457$ 38.9 = nValue of type writer becomes 200 after 38.9 years.

Ouestion 38

An annuity with an extended life is classified as

(a) extended life (c) deferred perpetuity **Answer: b**

(b) perpetuitv (d) due perpetuity

Explanation:

Perpetuity is a type of annuity that receives an infinite amount of periodic payments. An annuity is a financial instrument that pays consistent periodic payment. As with any annuity, the perpetuity value formula sums the present value of future cash flows.

Ouestion39

Periodic rate if it is multiplied with per year number of compounding periods is called

(a) extrinsic rate of return

(c) annual rate of return

(b) intrinsic rate of return (d) nominal annual rate

Answer: d **Explanation**:

An interest rate is called **nominal** if the frequency o compounding (e.g. a month) is not identical to the basic time unit in which the **nominal rate** is guoted (normally a year).

Ouestion 40

A deposit of Rs. 100 is placed into a college fund at the beginning of every month for 10 years. The fund Earns 9% annual interest, compounded monthly, and paid at end of the month. How much is in the account right after the last deposit?

(a)	193751.43
(c)	11231.67

(b) 11244.43 (d) 61658.67

Answer: a **Explanation**:

The value of the initial deposit is Rs. 100, so $a_1 = 100$. A total of 120 monthly deposits are made in the 10 years, so n = 120. To find r, divide the annual interest rate by 12 to find the monthly interest rate and add 1 to represent the new monthly deposit.

 $r=1+\frac{0.09}{12}=1.0075$

Substitute a₁=100, r = 1.0075

, and n = 120 into the formula for the sum of the first n terms of a geometric series, and simplify to find the value of the annuity.

 $S_{120} = \frac{100(1 - 1.0075^{120})}{1 - 1.0075}$ = 19351.73

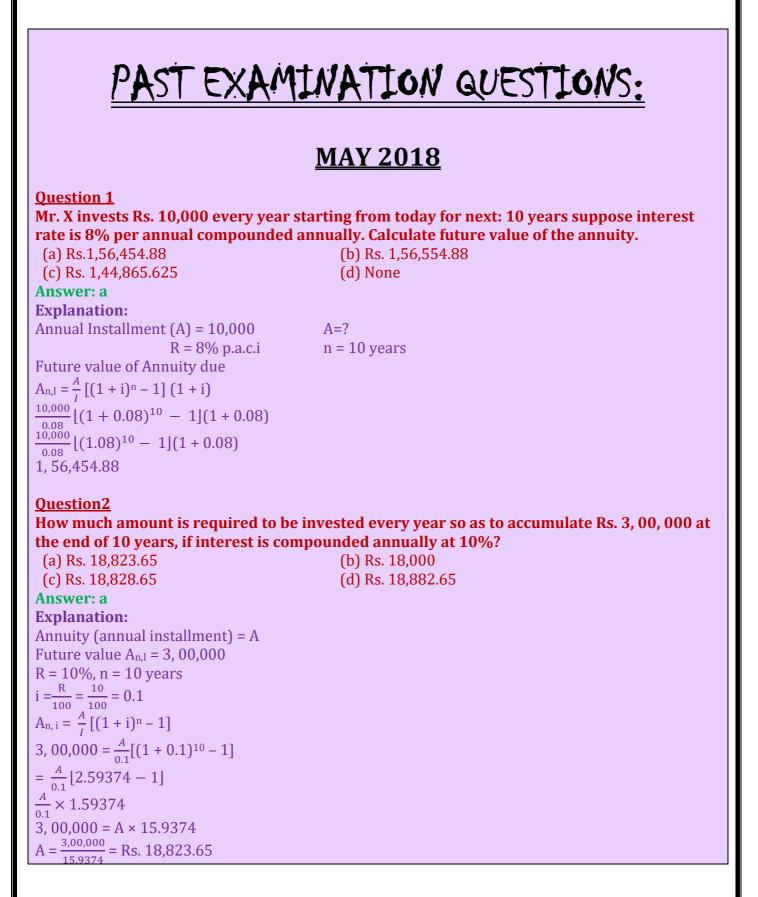
Ouestion 41

Relationship between annual nominal rate of interest and annual effective rat6e of interest, if frequency of compounding is greater than one:

(a) Effective rate>Nominal rate (c) Effective rate = Nominal rate Answer: a

- (b) Effective rate < Nominal rate
- (d) None of the above

Explanation: Effective rate > Nominal rate



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Question 3

If Rs. 1,000 be invested at interest rate of 5% and the interest is added to the principal every 10 years, then the number of years in which it will amount to Rs. 2,000 is

(b) $6\frac{1}{4}$ years (d) $6\frac{2}{3}$ years (a) $16\frac{2}{2}$ years (c) 16 years Answer: a **Explanation:** P =1,000, R = 5%p.a.s.i., T = 10 years $SI = \frac{PRT}{100} = \frac{1000 \times 5 \times 10}{100} = 500$ Amount after 10 years A=P + S. I. = 1,000 + 500 = 1,500 Now after 10 years P = 1,500, R = 5% k = 2,000, T=? S.I. = A-P= 2,000 - 1,500= 500 $T = \frac{SI}{P \times R} = \frac{500 \times 100}{1500 \times 5} = \frac{20}{3} = 6\frac{2}{3}$ Years Total time taken = 10 years + $6\frac{2}{3}$ years $=16\frac{2}{3}$ **Question 4** A person borrows Rs. 5,000 for 2 years at 4% per annual simple interest. He immediately lends to another person at $6\frac{1}{4}$ %. Per annual for 2 years find his gain in the transaction for year: (a) 112.50 (b) 225 (c) 125 (d) 107.50

Answer: b Explanation: Case - 1 P = 5,000 R = 4% p.a.s.i T = 2 years SI = $\frac{PRT}{100} = \frac{5000 \times 4 \times 2}{100} = 400$ Case - 2 P = 5,000 R = $6\frac{1}{4}\% = \frac{25}{4}\%$ p.a.s.i. T = 2 Years SI = $\frac{PRT}{100} = \frac{5000 \times 25}{100 \times 24} \times 2 = 625$ His gain = 625 - 400 = 225

Question 5

If an amount is kept at S.I. it earns an interest of Rs. 600 in first two years but when kept at compound interest it earns an interest of 660 for the same period, then the rate of interest and principal amount respectively are

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(a) 20%., Rs. 1,200	(b) 20%, Rs. 1,500
(c) 10%, Rs. 1,200	(d) 10%, Rs. 1,500
Answer: b	
Explanation:	
Case – 1	
Let $P = X$, $R = R$, $T = 2$, S.I. = 600	
$SI = \frac{PRT}{100} =$	
$600 = \frac{XR2}{XR2}$	
100	
$XR = \frac{600 \times 100}{2}$	
XR =30,000	
$X = \frac{30,000}{P}$ (1)	
Case – 2	
P = X, R, T = 2, C.I = 660	
C.I. = P [$(1 + \frac{R}{100})^2 - 1$]	
100	
$600\left[\frac{30,000}{R}\right]\left[\left(1+\frac{R}{100}\right)^2 - (1)^2\right]$	
$600\left[\frac{30,000}{R}\right]\left[\left(1+\frac{R}{100}+1\right)\left(1+\frac{R}{100}\right)-1\right]$	
$600\left[\frac{30,000}{R}\right]\left[\left(2+\frac{R}{100}+1\right)\left(1+\frac{R}{100}\right)-1\right]$	
$\left[\frac{600}{300}\right] = 2 + \left[\left(\frac{R}{100}\right)\right]$	
$\frac{\frac{R}{100}}{\frac{100}{100}} = \frac{600}{300} - 2$	
100 300	
$\frac{\frac{R}{100}}{\frac{R}{100}} = \frac{\frac{600 \times 600}{300}}{\frac{60}{100}}$	
$\frac{R}{R} = \frac{60}{100}$	
$R = \frac{300}{300} = 20\%$	
500	
Putting $R = 20\%$ in	
$X = \frac{30,000}{20}$	
X = Rs. 1,500	
Hence:	
P = x= Rs. 1500	
R = 20%p.a.	
Question 6	
	Made annually for 5 year the interest of 14%
compounded annually is:	
(a) 5610	(b) 6610 (d) 5160
(c) 6160	(d) 5160
Answer: b	
Explanation: Given Appuity (A) = $t = 1,000$	
Given, Annuity (A) = t 1,000 R = 14%	
$i = \frac{14}{100} = 0.14$	
Future value n = 5	
$A_{n,i} = \frac{A}{I} [(1+i)^n - 1]$	

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6262969699 For enquiry -6262969604 $\frac{1000}{0.14}[(1+0.14)^5-1]$ $\frac{\frac{1000}{0.14}}{\frac{1000}{0.14}} \begin{bmatrix} 1.92541 - 1 \end{bmatrix}$ Rs. 6,610 <u>NOV 2018</u> **Ouestion 1** If Rs. 10,000 is invested at 8% per year compound quarterly, then the value of the investment after 2 years is [given $(1 + 0.2)^8 = 1.171$] (a) 11,716.59 (b) 10,716.59 (c) 117.1659 (d) None Answer: a **Explanation**: Given P = 10,000, R = $\frac{8\%}{4}$ R = 2% Quarterly $T = 2 \times 4 = 8Quarter$ Value of investment after 'T, years $\mathbf{A} = \mathbf{P} \left[\mathbf{1} + \frac{R}{100} \right]^T$ $10,000 \left[1 + \frac{2}{100}\right]^8$ 10,000(1+0.02)8 10,000× (1.02)8 10.000×1.171659 11,716.59 **Question 2** A bank pays 10% rate of interest; interest being calculated half yearly. A sum of Rs. 400 is deposited in the bank. The amount at the end of 1 year will be (a) 440 (b) 439 (c) 441 (d) 442**Answer:** a **Explanation**: Given principal (P) = 400R = 10%p.a. T = 1 year Amount after T years $A = P \left[1 + \frac{R}{100} \right]^{T}$ $= 400 \left[1 + \frac{10}{100} \right]^{1}$ =400(1.1)= 440**Question 3** A Certain money doubles itself in 10 years. When deposited on simple interest. It would triple itself in_

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(a) 20 Vaara	(h) 11		
(a) 20 Years (c) 25 years		5 years) years	
Answer: a	(u) 50	years	
Explanation:			
Case – 1 Let $Principal (P) = 100$	$A \rightarrow A = A + (A) - 200$	D _2	T 10 V
Let Principal (P) = 100 ,	Amount $(A) = 200,$	R = :	T = 10 years
S. I. = $A - P$			
= 200 - 100			
= 100			
$\mathbf{R} = \frac{SI \times 100}{P \times T}$			
$=\frac{100\times100}{100\times10}$			
R = 10%			
Case – II			
Let Principal $(P) = 100$			
Amount (A) = 300			
(T) = 10 Years			
(1) = 10 rears S.I. = A-P			
5.1. = A - P = 300 - 100 = 200			
$T = \frac{SI \times 100}{100} = 200$			
$P \times R$			
$\frac{200 \times 100}{100 \times 10}$ = 20 Years			
100 ×10 SHORTCUT			
٨		С	
^A 10 Years	~ 10 voarc	300	
Question4			
-	in a bank for 3 years a	t 5% per annu	um compound interest, after 3
years he will get			
(a) 8,800	(b) 9,2		
(c) 9,200	(d) 9,0	000	
Answer: b			
Explanation:			
Given			
P = 8000			
R = 5% p.a.			
T = 3 years			
$A = P \left[1 + \frac{R}{100} \right]^{T}$ = 8000 $\left[1 + \frac{5}{100} \right]^{3}$			
$= 8000 \left[1 + \frac{5}{100} \right]^3$			
$= 8000(1.05)^{3}$ = 8,000×1.05×1.05×1.05			
= 9,261			
Ouestion5			
-	incipal of Ps. 100 amou	inte to De 12	1 when the interest at the rate of
r% is compounded annu			. When the interest at the rate of
(a) 10.5	(b) 10		
		170	
		1	
(c) 15	(d) 14	1	

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Answer: b Explanation: Given, Principal (P) = Rs. 100Amount (A) = Rs. 121 Rate R = r% p.a. Time T = 2 year The amount after "T" year $A = P \left[1 + \frac{R}{100} \right]^T$ $121 = 100 \left[1 + \frac{r}{100} \right]^2$ $\frac{121}{100} = \left[1 + \frac{r}{100} \right]^2$ $\left(\frac{11}{10} \right)^2 = \left[1 + \frac{r}{100} \right]^2$ On communic **On comparing Ouestion6** A certain sum of money Q was deposited for 5 year and 4 months 4.5% simple interest and amounted to Rs 248, and then the value of Q is (a) 200 (c) 220 **Answer: a Explanation**: Principal (P) Given R = xT = 4.5%= 5 years 4 month = 5 years + $\frac{4}{12}$ years = 5 years + $\frac{1}{3}$ years $=5\frac{1}{3}$ years $=\frac{16}{3}$ years Amount after T years A = P + S.I. $A = P + \frac{PRT}{PRT}$ $A = P + \frac{100}{100}$ $A = X + \frac{X \times 45 \times 16}{1000 \times 3}$ $248 = X + \frac{24X}{100}$ 124X = 24800 $X = \frac{24800}{124} = 200$

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(b) 210

(d) 240

Question7	
	the names of his three sons A,B and C in such a way
	nd 4 years respectively. If the rate of interest is 5%,
then the ratio of amount invested in the r	
(a) 6: 4: 3	(b) 3: 4: 6
(c) 30: 12: 5	(d) None
Answer: a	
Explanation:	
Total amount invested = {15,860	
Amount Invested into three persons (son's)	A, B, C.
Let	
Amount Invest in the Name of A = Rs. X	
Amount Invest in the Name of B = Rs. Y	
Amount Invest in the Name of C = Rs. Z	
Then	
Case – 1 For A	
P = Rs. X, A = 5% T = 2 years	
(S.I.) $_{1} = \frac{p_{1}R_{1}T_{1}}{100} = \frac{X \times 5 \times 2}{100} = \frac{10X}{100}$	
$C_{100} = 100 = 100 = 100$ Case – 2 for B	
$P_2 = Rs. Y, R_2 = 5\%, T_2 = 3 years$	
$(S.I.)_{2} = \frac{P_{2}R_{2}T_{2}}{100} = \frac{Y \times 5 \times 3}{100} = \frac{15Y}{100}$	
Case – 3 for C	
$P_3 = t z, R_3 = 5\%, T_3 = 4 years$	
$(S. I.)_3 = \frac{P_3 R_3 T_3}{100} = \frac{Z \times 5 \times 4}{100} = \frac{20Z}{100}$	
Given $(S. I.)_1 = (S. I.)_2 = (S. I.)_3$	
$\frac{10X}{100} = \frac{15Y}{100} = \frac{20Z}{100}$	
10X = 15Y = 20Z = K 10X = K $15X = K$ $20Z = K$	
10X = K, 15Y = K, 20Z = K	
$X = \frac{k}{10}, y = \frac{k}{15}, z = \frac{k}{20}$	
X: y: $z = \frac{k}{10}: \frac{k}{15}: \frac{k}{20}$	
$\frac{1}{10}: \frac{1}{15}: \frac{1}{20} = 60 \times \frac{1}{10}: 60 \times \frac{1}{15}: 60 \times \frac{1}{20}$	
6:4:3	
Question 8	
· · · · · · · · · · · · · · · · · · ·	nterest compounded annually and simple interest
	or two years is 372, then the principal amount is
(a) 37,200	(b) 37,000
(c) 37,500	(d) None of the above
Answer: a	
Explanation: $(P)^2$	
For two year C.I S.I. = $P\left(\frac{R}{100}\right)^2$	
$372 = P\left(\frac{10}{100}\right)^2$	
372 P (0.1) ²	
5721 (0.1)	

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$P = \frac{372}{(0.1)^2} = \frac{372}{001} \times 100$	
= 37,200	
- ,	
Question 9	
	property which would be valued at 2 lakh at end of 2
years? (Annual rate of increase = 5%) (a) 1.81 lakh	(b) 2.01 lakh
(c) 2.00 lakh	(d) None of the above
Answer: a	
Explanation:	
Let, Present value (P) = P	
A = Rs. 2,00,000	
A = 5%	
$A = P \left[1 + \frac{R}{100} \right]^T$	
2, 00,000 = $P\left[1 + \frac{5}{100}\right]^2$	
$2,00,000 = P (1.05)^{2}$	
$P = \frac{2,00,000}{(1.05)^2} = \frac{2,00,000}{1.1025}$	
= 1, 81,405.896	
= 1.81 lakhs	
Question 10	
	r deposit corresponding to a nominal 7% rate of
interest per annum convertible quarterly	y is:
(a) 7%	(b) 7.5%
(c) 7.4%	(d) 7.18%
Answer: (D) Explanation:	
Given R = $\frac{7}{4}$ % Quarterly = 1.75%	
1	
T = 1 x 4 Quarterly = 4 Quarterly	
Effective Rate (E) = $\left[\left(1 + \frac{R}{100} \right)^T - 1 \right] \times 100\%$	6
$\left[\left(1 + \frac{1.75}{100} \right)^4 - 1 \right] \times 100\%$	
$[(1 + 0.0175)^4 - 1] \times 100\%$	
[(1.0175) ⁴] × 100% [1.07185 – 1] × 100%	
0.0718 × 100%	
= 7.18%	
Question 11	
Question 11 How much will Rs. 25.000 amount to in 2	years at Compound interest if the rates for the
successive years are 4% and 5% per year	
(a) 27,300	(b) 27,000
(c) 27,500	(d) None
Answer: a	

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Explanation: Given principal (P) = 25000 R₁ = 4% R₂ = 5% T = 2 years Amount after 'Rs' years A = P $\left[1 + \frac{R_1}{100}\right]^1 \left[1 + \frac{R_2}{100}\right]^1$ A = 25000 $\left[1 + \frac{4}{100}\right]^1 \left[1 + \frac{5}{100}\right]^1$ = 25000 $\left(1 + \frac{1}{25}\right) \left(1 + \frac{1}{20}\right)$ = 25000 $\left(\frac{26}{25}\right) \times \left(\frac{21}{20}\right)$ = 27300

Question 12

(a) Rs. 8800

Rs.8000 /- at 10% per annum interest compounded half yearly will become at the end of one year.

(b) Rs. 8820

(d) Rs. 9600

(c) Rs. 8900 Answer: b

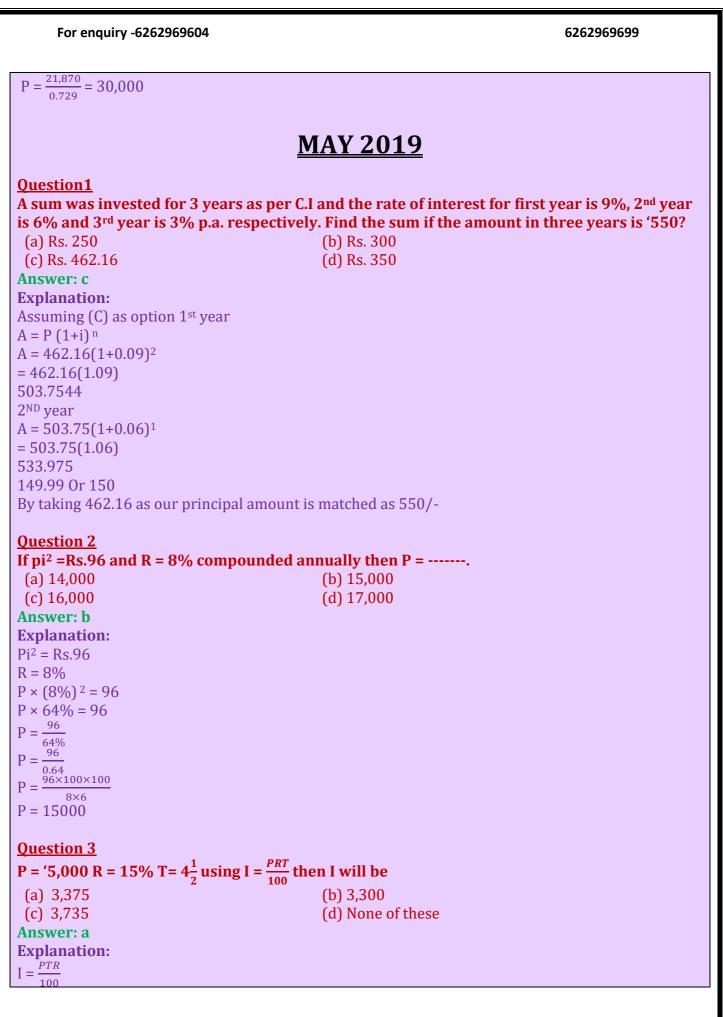
Explanation: Given P = 8000, R = $\frac{10}{2}$ % = 5%, T = 1×2h.y, T = 2 A = P $\left[1 + \frac{R}{100}\right]^{T}$ = 8000 $\left[1 + \frac{5}{100}\right]^{2}$ = 8000 $\left[\frac{21}{20}\right]^{2}$ = 8000× $\frac{21}{20}$ × $\frac{21}{20}$ = 20×21×21 = 8820

Question13

The value of furniture depreciates by 10% a year, it the present value of the furniture in an office is Rs. 21,870, calculated the value of furniture 3 year ago

(a) 30,000/- (b) 35,000/-(c) 40,000/- (d) 50,000/- **Answer: a Explanation:** Present value of furniture (A) = 21,870/-Rate of Depreciation (R) = 10% Time T = 3 year ago Value of furniture 3 year ago = P Scrap value after T years $A = P \left[1 - \frac{R}{100}\right]^T$ $21,870 = P \left[1 - \frac{10}{100}\right]^3$ $21,870 = P (0.9)^3$

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$= 5000 \times \frac{4.5}{3}$	5 15
- 5000 α	100
= 3375	

Question 4

A sum of money amounts to 6,200 in 2 years and 7,400 in 3 years and as per S.I. then the principal is. (a) 3,000 (b) 3,500

(d) None of these

(c) 3,800

Answer: c

Explanation: $A_2 = 6200 \rightarrow P + P \times R \times T = 6200$ $A_3 = 7400 \rightarrow P [1 + 2R] = 6200$ $P + P \times R \times T = 7400$ P [1 + 3R] = 7400P = 3800

Question 5

The effective rate of interest does not depend upon

(a) Amount of Principal (c) Number of Conversion periods (b) Amount of interest(d) None of these

Answer: a Explanation:

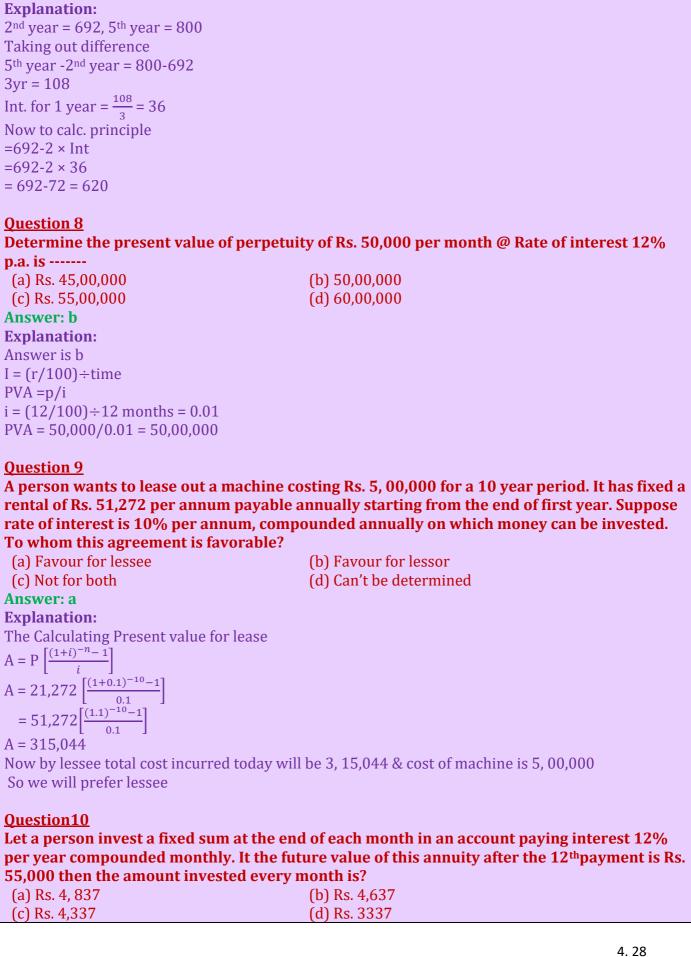
The Effective Rate of interest does not depend upon amount of principal

Question 6

In simple interest if the principal is '2,000 and the rate and time are the Roots of the equations $x^2 - 11x + 30 = 0$ then the simple interest is ------(a) 500 (b) 600 (c) 700 (d) 800**Answer: b Explanation**: P = 2000R? T? $X^2 - 11X + 30 = 0$ $X^2 - 6X - 5X + 30 = 0$ X[X-6]-5[X-6] = 0(X-5) = 0 X = 5(X-6)=0 X=6R = 5 , T = 6 $\frac{P \times R \times T}{100} = 2000 \times \frac{5}{100} \times 6$ = 600**Ouestion7** The certain sum of money became '692/- in 2 yrs and '800/- in 5 years then the principal Amount is ------(a) 520 (b) 620 (c) 720 (d) 820 **Answer: b**

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Answer: c	
Explanation:	
$FV = C \times \left[\frac{(1+i)^n - 1}{i}\right]$	
$55000 = C \times \left[\frac{(1+0.01)^{12} - 1}{0.12} \right]$	
= 4337	
Ouestion 11	
	r at 10% of its previous value and the end of 4 th year
value is Rs. 131220. Find the original val	
(a) Rs. 2,00,000	(b) Rs. 2,02,000
(c) Rs. 2,01,000	(d) Rs. 2,03,000
Answer: a	
Explanation:	
-	0. Now, depreciate the value by 10% and 5%
alternatively.	
	==> 76.96 ==5% ==> 73.10 (at the end of 4 th year.)
Now, comparing,	
73.10 = 146205	
1 = 146205/73.10	
$100 = (146205 \times 100)/73.10 = 2,00,006.$ (A)	nnrox)
So, value at the start = $Rs. 200000$	
50, value at the start – AS. 200000	
	101/2010
<u> </u>	<u>IOV 2019</u>
Question1	
A man invests Rs. 12,000 at 10% p.a. and	another sum of money at 20% p.a. for one year. The
total investment earns at 14% p.a. simpl	e interest the total investment is:
(a) Rs 8,000	(b) Rs. 20,000
(c) Rs. 14,000	(d) Rs. 16,000
Answer: (b)	
Explanation:	
Let the another sum of money be x	
So total investment Rs. (12,000 + x)	

 $SI = \frac{P \times R \times T}{100}$ According to question $\frac{12,000 \times 10 \times 1}{100} + \frac{x \times 20 \times 1}{100} = (12,000 + x) \times \frac{14}{100} \times 1$ 1, 20,000 + 20x = 1, 68,000 + 14x 6x = Rs. 48,000 X = Rs. 8,000 So total investment = Rs. (12,000 + x)= Rs. (12,000 + 8000) = Rs. 20,000

Question 2

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Let the two rates of interest be r1%, r2%	
(a) 0.4	(b) 4
(c) 0.004	(d) 18
Answer: (a)	
Explanation:	
$SI = \frac{P \times R \times T}{100}$	
According to question	
$(SI)_1 - (SI)_2 = 18$	
$1500 \times \frac{r_1}{(100)} \times 3 - 1500 \times \frac{r_2}{(100)} \times 3 = 8$	
$\frac{4500}{(100)} \left(r_1 - r_2 \right) = 18$	
(r_{10}) $(r_{1} - r_{2}) = 0.4$	
So, the difference in their rates is 0.4.	
50, the unterence in their rates is 0.4.	
<u>Ouestion3</u>	
Find the effective rate of interest on paya	able half yearly at 5% n a
(a) 5.06%	(b) 4%
(c) 0.4%	(d) 3%
Answer: (a)	
Explanation:	
Here, $R = 5\% T = 1 \text{ yr}$	
Since interest is payable half yearly	
$R = \frac{5}{2}\%$ and $T = 1 \times 2 = 2$ Year	
Δ	
$=\left[\left(1+\frac{R}{100}\right)^{T}-1\right]\times 100$	
$=\left[\left(1+\frac{5}{2\times100}\right)^2-1\right]\times100$	
$= [(1.025)^2 - 1] \times 100$	
= [0.050625] × 100	
= 5.0625%	
= 5.06% (Approx.)	
Question 4	
Find the effective rate of interest at 10%	
(a) 10.38%	(b) 5%
(c) 5.04%	(d) 4%
Answer: (a)	
Explanation:	
Here; R = 10% T = 1 year	
Since interest is payable quarterly	
$R = \frac{10\%}{4}$ T = 1 x 4 years	
$=\left[\left(1+\frac{r}{100}\right)^{T}-1\right]\times 100$	
$=\left[\left(1+\frac{10}{4\times100}\right)^4-1\right]\times100$	
$= [(1.025)^4 - 1] \times 100$	
= 10.38%	

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Question 5

What will be the population after 3 years when present populations is Rs. 25,000 and populations increase at the rate of 3% in 1 year, at 4% in II year, and at 5% in III year? (a) Rs. 28,119 (b) Rs. 29,118 (c) Rs. 27,000 (d) Rs. 30,000 Answer: (a) **Explanation:** When population increase at the rate of r_1 % in 1^{st} year, r_2 % in IInd year and r_3 % in IIIrd year. Population after' years is given by A = P $\left(1 + \frac{r_1}{100}\right) \left(1 + \frac{r_2}{100}\right) \left(1 + \frac{r_3}{100}\right)$ Here, P = 25,000 $r_1 = 3\%$, $r_2 = 4\%$ $r_3 = 5\%$ Population after 3 years = 25,000 $\left(1 + \frac{r}{100}\right) \left(1 + \frac{r}{100}\right) \left(1 + \frac{r}{100}\right)$ = Rs. 28,119 **Ouestion6** The value of scooter is Rs. 10,000 find its value after 7 years if rate of depreciation is 10% p.a. (a) 4,782.96 (b) 4,278.69 (d) 42,000 (c) 42,079 **Answer: a Explanation:** We know $A = P \left(1 - \frac{R}{100} \right)^{T}$ Where, A scrap value P Present value R Rate of depreciation T time Here P = 10,000, R = 10%, T = 7 years A = 10,000 $\left(1 - \frac{10}{100}\right)^7$ A = 4782.96So value of scooter is 4782.96 after 7 years **Ouestion 7** SI = 0.125P at 10% p.a. Find time. (a) 1.25 years (b) 25 years (c) 0.25 years (d) None Answer: (a) **Explanation:** We know. $SI = \frac{p \times R \times T}{T}$ 100 Here, SI = 0.125P R = 10% Put these values in the above formula $0.125 \text{ P} = \text{P} \times \frac{10}{100} \times \text{T}$ $T = \frac{0.125P \times 100}{10 \times P}$ $= 10 \times 0.125$ T = 1.25 Years

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Ouestion 8 Scrap value of a machine valued at 10, 00,000, after 10 years within depreciation at 10% p.a.? (a) 348678.44 (b) 33,84,679.45 (c) 4,00,000 (d) 3,00,000 Answer: (a) **Explanation:** We Know, $A = P \left(1 - \frac{R}{100} \right)^T$ Where A => Scrap value after't' years. P => Present value R => Rate of depreciation Here, P = Rs. 10, 00,000, R = 10%, T = 10 Years A = 10,00,000 $\left(1 - \frac{10}{100}\right)^{10}$ = 348678.44 So value of machine after 10 year will be 348678.44 **Ouestion 9** The difference between CI and SI for 2 years is 21. If rate of Interest 5% find principal (a) Rs. 8400 (b) Rs.4800 (c) Rs. 8,000 (d) Rs. 8,200 Answer:(a) **Explanation:** CI = P $\begin{bmatrix} \left(1 + \frac{R}{100}\right)^T - 1 \end{bmatrix}$ SI= $\frac{P \times R \times T}{100}$ CI = P $\begin{bmatrix} \left(1 + \frac{R}{100}\right)^2 - 1 \end{bmatrix}$ SI= $\frac{P \times 5 \times 2}{100}$ CI = P |1.1025 - 1|CI = P(0.1025)21= 0.0025 P P = Rs. $\frac{21}{0.0025}$ = Rs. 8400 So principal is 8400 **Ouestion 10** Present value of a scooter is Rs. 7,290 if its value decreases every year by 10% then its value before 3 years is equal to: (a) 10,000 (b) 10,500 (c) 20,000 (d) 20,500 Answer:(a) **Explanation**: Let the value of the scooter be Rs. X before 3 years Before three years, A (scrap value after 3 year) = Rs. 7,290 R = 10% (dep rate) T = 3 years $\mathbf{A} = \mathbf{P} \left(1 - \frac{R}{100} \right)^T$

7,290 = P $\left(1 - \frac{R}{100}\right)^3$ P = Rs. 10,000

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Question 1

On what sum will the compound interest at 5% p.a for 2 years compounded annually be Rs.3, 280?

(b) Rs. 32,000

(d) Rs. 64,000

- (a) Rs. 16,000
- (c) Rs. 48,000
- Answer: b

Explanation:

Let the sum be Rs. X We Know that:

$$= P \left(1 + \frac{R}{100}\right)^{n} - P$$

= $P \left(1 + \frac{R}{100}\right)^{n} - 1$
 $3280 = x \left[\left(1 + \frac{R}{100}\right)^{n} - 1$
 $3280 = x[1.05^{2} - 1]$
 $x = \frac{3280}{0.1025}$
 $x = 32.000$

Question 2

What sum of money will produce Rs.42, 800 as an interest in 3 years and 3 months at 2.5% p.a simple interest?

(b) Rs.5,26,769

(d) Rs.2,24,000

(a) Rs.3,78,000 (c) Rs.4,22,000 Answer: b Explanation: We know I=P×it $42,800 = P \times \frac{2.5}{100} \times 3\frac{3}{12}$

P = 5, 26,769

Question 3

An amount P becomes Rs.5, 100.5 and Rs.5,203 after second and fourth years respectively, at r% of interest per annum compounded annually. Thus, values of P and r are

(a) Rs.5,000 and 1 (c) Rs.6,000 and 2 (b) Rs.4,000 and 1.5 (c) Rs.5,500 and 3

Answer: a

Explanation: By option a 5000 as P & 1% = r For 2 year 5000 +1%+1% = 5100.5 For 4 year 5000+1%+1% +1% +1% = 5203

Question 4

A certain sum invested at 4% per annum compounded semi-annually amounts to Rs.1,

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20,000 at the end of one year. Find the sum (a) 1,10,120 (b) 1,15,340 (c) 1,12,812 (d) 1,13,113 **Answer: b Explanation:** An= 1,20,000 $n=2 \times 1 = 2$ i= 4×1/2% = 2%=0.02 P(in Rs) = ?We have $An = P(1+0.02)^2$ $1,20,000 = P(1.02)^2$ =1,15,340 **Ouestion 5** Rs. 2,500 is paid every year for 10 years to pay off a loan. What is the loan amount if interest rate be 14% per annum compounded annually? (a) 13,040.27 (b) 15,847.90 (c) 14,674.21 (d) 16,345.11 **Answer: a Explanation**: V=A.P. (n, i) Here A=Rs.25,00 n=10 i=0.14 V=2,500×P (10,0.14) =2,500×5.21611=Rs. 13,040.27 Therefore the loan amount is RS. 13.040.27 **Ouestion 6** The ratio of principal and the compound interest value for three years (compounded annually) is 216: 127. The rate of interest is (b) 0.1777 (a) 0.1567 (c) 0.1667 (d) 0.1588 **Answer: c Explanation**: Le the principal be P, then Compound interest, CI : $\frac{p}{CI} = \frac{216}{127}$ \Rightarrow CI = $\frac{127}{216}$ P $CI = P \left[1 + \frac{R}{100} \right]^{T} - P$ $\Rightarrow \frac{127}{216} P = P \left[1 + \frac{R}{100} \right]^3 - P$ → $\frac{127}{216} = \left(1 + \frac{R}{100}\right)^3 - 1$

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→ ¹²⁷/₂₁₆ + 1 = (1 + ^R/₁₀₀)³

→ ³⁴³/₂₁₆ = (1 + ^R/₁₀₀)³

→ 1 + ^R/₁₀₀ = (³⁴³/₂₁₆)^{1/3}

→ 1 + ^R/₁₀₀ = ⁷/₆

→ ^R/₁₀₀ = ⁷/₆ - 1

→ R = ¹/₆ × 100

→ R = 16.67% = 0.1667

Hence, 16.67% (Option C) is correct.

Question 7

Find the present value of Rs.1, 00,000 be required after 5 years if the rate of interest is 9% given that (1.09)5 = 1.5386

(b) 64,994.20 (d) 93,902.12

(a) 78,995.98 (c) 88,992.43 **Answer: b Explanation:** Here i = 0.09 = 9%n= 5 A_n= 10,000 Required present value = $\frac{A_n}{(1+i)^n}$ = $\frac{1,00,000}{(1+0.09)^5}$ Rs. 64,994.20

Question 8

Suppose you deposit Rs.900 per month into an account that pays 14.8% interest compounded monthly. How much money will you get after 9 months?

(a) Rs. 8,511 (c) Rs. 9,200 (b) Rs. 9,000 (d) Rs. 1,000

Answer: a

Explanation: Here, P = Rs. 900 , R= 14.8% and T = $\frac{9}{12} = \frac{3}{4}$

 $A = P \left(1 + \frac{R}{100} \right)^{3/4}$ $A = P \left(1 + \frac{14.8}{100} \right)^{3/4}$ A = 8,511

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Question 9

An amount is lent at a nominal rate of 4.5% per annum compounded quarterly. What would be the gain in rupees over when compounded annually?

(a) 0.56 (b) 0.45 (c) 0.76 (d) 0.85 **Answer: c Explanation**: Let the principal be Rs. 1 and rate is 4.5% per annum Compounded Annually:- $A = P \left(1 + \frac{r}{100} \right)^n$ Compounded Quarterly:- $A = P \left(1 + \frac{r}{100} \right)^{4n}$ A = $1\left(1 + \frac{4.5}{100}\right)^1 = \frac{104.5}{100} = 1.04500$ $A = 1 \left(1 + \frac{4.5}{100} \right)^4 = \frac{104.5}{100} = 1.04500$ Gain = 0.00076 Now, gain for Rs. 1 = 0.00076Gain for Rs. 1000 = 0.76**Question 10** Determine the present value of perpetuity Rs.10 per month for infinite period at an effective rate of interest of 14% p.a.? (a) Rs.657 (b) Rs.757 (c) Rs.857 (d) Rs.957 **Answer: c Explanation**: $i = \frac{(r/100)}{r}$ T 10 PVA=-0.01166 $i = \frac{(14/100)}{100}$ 12 = 857 **Ouestion 11** Which of the following statement is true? (a) F.V of ordinary annuity < F.V of (b) F.V of ordinary annuity > F.V of annuity due annuity due (c) P.V of ordinary annuity > P.V of (d) None of these annuity due Answer: a **Explanation**: F.V of ordinary annuity < F.V of annuity due **JAN 2021**

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Question 1

A certain sum amounted to Rs. 575 at 5% in a tie which Rs. 750 amounted to Rs. 840 at 4% if the rate of interest is simple, find the sum.

(a) Rs. 525 (c) Rs. 515 Answer: d Explanation: Time = $\frac{90 \times 100}{750 \times 4}$ = 3 year Sum = $\frac{100 \times A}{100 + rt}$ $\frac{100 \times 575}{100 + 3 \times 5}$ = 500 There is a direct relationship between the principal and the amount and is given by SUM = (100*Amount)/(100+rt)

Question 2

Find the amount of compound interest, if an amount of Rs. 50,000 is deposited in a bank for one year at the rate of 8% per annum compounded semiannually.

(a) Rs. 3,080 (b) Rs. 4,080 (c) Rs. 5,456 (d) Rs. 7,856 Answer: b **Explanation:** It is given that Principal (P) = 50000Rate of interest (r) = 8% p.a. = 4% semi-annually Period (n) = $\frac{1}{2}$ years = 2 semi-annually We know that Amount = $P(1+r/100)^{n}$ Substituting the values $= 50000(1+4/100)^{2}$ By further calculation $= 50000(26/25)^2$ $= 50000 \times \frac{\frac{26}{25}}{\frac{26}{25}} \times \frac{\frac{26}{25}}{\frac{26}{25}}$ = 54.080Here Compound interest = A - P Substituting the values = 54,080-50000 =4.080

Question 3

 The population of a town increases by 2% of the population of the beginning of that year. The number of years by which the total increase in population would be 40% is

 (a) 7 years
 (b) 10 years
 (c) 17 years (approx.)
 (d) 19 years (approx...)

 Answer: c

 Explanation:
 lets assume that the initial population was P

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now after a year population will be $= P \left[1 + \frac{2}{100} \right]$ =P(102/100)=1.02P Similarly after 2 years population will be =1.02 x 1.02 x P So after n number of years population will be $=P x (1.02^{n})$ now this population should be equal to P+40%P, so $1.4P=P \times (1.02^{n})$ 1.4=1.02ⁿ 1.0217=1.02n so n=17 that means after 17 years the total increase in the population will be 40% of that of initial population.

Ouestion 4

Find the future value of annuity of Rs. 1,000 made annually for 7 years at interest rate of 14% compounded annually [Given that $1.14^7 = 2.5023$]

(a) Rs. 10,730.7	(b) Rs. 5,365.35
(c) Rs. 8,756	(d) Rs. 9,892.34
Answer: a	
Explanation:	
Annual Payment A= Rs. 1000	
n= 7	
i= 14% = 0.14	
A(7, 0.14) = 1000 $\left[\frac{(1+1.014)^7 - 1}{0.14}\right] = 10,730.7$	

Ouestion 5

Two equal amounts of money an deposited in two banks each at 15% p.a. fix 3.5 years in the bank and fix 5 years in the either. The difference between the interest amounts from the banks in Rs. 144 find the sum.

(a) Rs. 620 (c) Rs. 820 **Answer: b Explanation**: 144×100 $(5-3.5) \times 15 = 640$

(b) Rs. 640 (d) Rs. 840

Ouestion 6

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The simple Interest on a sum at 4% p.a. for two years is Rs. 80. Find the compound interest on the same sum for the same period.

(a) Rs. 81.6	(b) Rs. 80.8
(c) Rs. 83.2	(d) Rs. 82.3
Answer: a	
Explanation:	
$SI = \frac{PTR}{TTR} = \frac{80 \times 100}{TTR} = 1000$	

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In CI with rate of interest = 4% and time =	2vears
Amount = $1000 \times \frac{104}{100} \times \frac{104}{100} = 1081.6$	Zycars
CI = A - P = 1081.6-1000 = 81.6	
Ouestion 7	
	mpounded quarterly or 9.1% p.a. simple interest?
(a) 9% compounded	(b) 9.1% S.I
(c) Both are same	(d) Cannot be said
Answer: a	
Explanation:	
	e interest will be 9.0% compounded quarterly.
The formulas are	
I C J	he interest is compounded annually, and investment will
be multiplied by $(1 + 1)^t$, but in this case, t =	= 1, so the multiplier will be 1 + .0925 = 1.0925.
Ouestion8	
	ling to nominal rate of 7% p.a. compounded
quarterly is.	
(a) 7.5%	(b) 7.6%
(c) 7.7%	(d) 7.18%
Answer: d	
Explanation:	
r = 7% p.a i.e 1.75% per quarter (7/4).	
So $1 + \text{reff} = (1.0175)^4 = 1.071859$	
implies reff = 7.1859	
Question 9	
	.a. how much would you pay to receive Rs. 200,
growing at 5% annually forever?	
(a) Rs. 2,500	(b) Rs. 5,000
(c) Rs. 7,500	(d) Rs. 10,000
Answer: d	
Explanation:	
$\frac{200}{0.07 - 0.05} = \frac{200}{0.02} = 10,000$	
0.07 - 0.05 - 0.02	
Question 10	
A man invested one-third of his capital a	at 7% one-fourth at 8% and the remainder at 10% if
the annual income is Rs. 5610, the capit	
(a) Rs. 4,400	(b) Rs. 5,500
(c) Rs. 6,600	(d) Rs. 5,800
Answer: c Explanation:	
Let the total capital be x. Then	
·	0
$\left(\frac{x}{3} \times \frac{7}{100} \times 1\right) + \left(\frac{x}{4} \times \frac{8}{100} \times 1\right) + \left(\frac{5x}{12} \times \frac{1}{100} \times 1\right)$	$\left(\frac{1}{100} \times 1\right) = 5610$
$=\frac{7x}{300}+\frac{x}{50}+\frac{x}{24}=5610$	
$=51x = (5610 \times 600)$	
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John our relegionmore	HILD WISH MWW.KINGSENTIL YULL STOUP

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6262969699 For enquiry -6262969604 $\mathbf{X} = \left(\frac{5610 \times 600}{51}\right)$ **Ouestion 11** A sum of money is lent at compound interest rate 20% p.a. two years. It would fetch Rs. 482 more if the interest is compounded half-yearly. Then the sum is. (a) Rs. 19,800 (b) Rs. 19,900 (c) Rs. 20,000 (d) Rs. 20,100 Answer: c **Explanation**: Let the sum of money lent out be Rs. x In the 1st case: $A_1 = Rs \ x \left(1 + \frac{20}{100}\right)^2 = Rs \cdot \frac{36x}{25} \ \therefore A = P \left(1 + \frac{r}{100}\right)^n$ $A_2 = Rs \ x \left(1 + \frac{20}{100 \times 2}\right)^{2 \times 2} = Rs \cdot \frac{14641x}{10000} \ \therefore A = P \left(1 + \frac{r}{2 \times 100}\right)^{n \times 2} \text{ (half yearly)}$ According to the question $\frac{\frac{14641x}{10000} - \frac{36x}{25} = 482}{= \frac{14641x - 14400x}{10000} = 482}$ = 241x = 4820000= x = 20000 \therefore The sum of money lent out = Rs.20,000 **Question 12** Rs. 800 is invested at the end of each month in an account paying interest 5% per year compounded monthly. What is the future value of his annually after tenth payment? (Given that $1.005^{10} = 1.0511$) (a) Rs. 4,444 (b) Rs. 8,756 (c) Rs. 3,491 (d) Rs. 8,176 Answer: d **Explanation:** A = Rs. 800n= 10 i = 5% p.a. $= 5/12 = \frac{5}{1200} \rightarrow 0.00416$ Future value of annuity after 10 months is given by $A(n,i) = A\left[\frac{1+i)^n - 1}{i}\right]$ A (10,0.4167) = 800 $\left[\frac{1+0.00416}{0.00416}\right]$ = Rs. 8.176 **Ouestion 13** When 'i' denote the actual rate of interest in decimal, and n denote the number of conversion periods, the formula for computing the effective rate of interest E is given by. (a) $(1+i)^n$ (b) $(1+i)^n - 1$ (d) $(1+i)^{-n}$ (c) $1 - (1 + i)^n$ Answer: b **Explanation:**

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$(1+i)^n - 1$

Question 14

The present value of an Annuity immediate is the same as

(a) Annuity regular for (n - 1) years plus the initial receipt in the beginning of the period.

(c) Annuity regular for (n + 1) years.

(b) Annuity regular for (n – 1) years initial receipt in the beginning of the period.

(d) Annuity regular for (n + 1) years plus the initial receipt in the beginning of the period.

Answer: a

Explanation: Annuity regular for (n – 1) years plus the initial receipt in the beginning of the period.

JULY 2021

Question 1

A sum of ₹ 7500 amounts to ₹ 9075 at 10% p.a., interest being compounded yearly in a certain time. The simple interest (in ₹) on the same sum for the same time and the same rate is

(a) 1000 (c) 1800		(b) 1250 (d) 1500
	_	

Answer: Options (d) Assuming throw trick 7500 + 10% + 10% = 9075Means 7500 took 2 years to be 9075 $\frac{7500 \times 2 \times 10}{100} = 1500$

10

Question 2

A loan of ₹ 1, 02,000 is to be paid back in two equal annual instalments. If the rate of interest is 4% p.a., compounded annually, then the total interest charged (in ₹) under this instalment plan is

F	
(a) 6160	(b) 8120
(c) 5980	(d) 7560

Answer: Options (a)

First let's call every instalment (1.04) $\div = 4 \text{ GT} \div = 1,02,000 = \text{each instalment is } 54,080$ 2 Instalments is $54,080 \times 2 = 1,08,160$ Net Instalment Paid = 1,08,160 - 1,02,000 = 6160

Question 3 If the desired future value after 5 years with value (in ₹) is (Given that (1.18) ⁵ = 2.2877)	18% interest rate is ₹ 1,50,000, then the present
(a) 63,712	(b) 65,568

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(c) 53,712	(d) 41,712
Answer: Options (b)	(u),·
65,568 + 18% + 18% + 18% + 18% + 18% =	: 1, 50,000 (approx.)
the interest is compounded half yearly? (
(a) 4271 (c) 4711	(b) 4171 (d) 4117
Answer: Options (b)	(U) 4117
Explanation:	
Given	
P = 12600 $n = 1^{1}_{2}$ Years = 3 Years	
$r = \frac{20}{2} = 10\%$	
We know that	
$A = P \left(1 + \frac{r}{100} \right)^n$	
$= 12,600 \left(1 + \frac{10}{100}\right)^3$	
$= 12,600 \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10}$	
$= 126 \times \frac{1331}{10}$	
$=\frac{167706}{10}$	
A = 16770.6	
Now,	
CI = A - P	
= 16770.6 - 12600	
= 4171 (Approx.)	
Question 4 A sum of ₹ x amounts to ₹ 27,900 in 3 yea	ars and to ₹ 41,850 in 6 years at a certain rate
percent per annum, when the interest is	compounded yearly. The value of is
(a) 16080	(b) 18600
(c) 18060	(d) 16800
Answer: Options (b) Explanation:	
-	it becomes Rs. 27,900 and after 6 years it becomes
41,850	
→ $\frac{27,900}{x} = \frac{41,850}{27,900}$	

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→ $X = \frac{27,900 \times 27,900}{41,850}$ → X = 18600

- X - 10000

Question 5

If the normal rate of growth is 17% and inflation is 9% for the five years. Let P be the Gross Domestic Product (GPD) amount at the present year then the projected real GDP after 6 years

(b) 1.921 P

(d) 2.15 P

is

(a) 1.587 P (c) 1.403 P Answer: Options (a)

Explanation:

Growth is 17% Inflation is 9% Net Growth = 8% Taking P = 100, T = 6 year, R = 8% 100 + 8% + 8% + 8% + 8% + 8% = 158.687 1.587 P = 100 1.587 × 100 = 158.7 (Approx.)

Question 6

If a person bought a house by paying \gtrless 45,00,000 down payment and \gtrless 80,000 at the end of each year till the perpetuity assuming the rate of interest as 16%, the present value of house (in \gtrless) is given as

(a) 47,00,000 (c) 57,80,000

(b) 45,00,000 (d) 50,00,000

Answer: Options (d) $\frac{80,000}{0.16}$ = [Perpetuity Firmula] = 5, 00,000 is to be deposited today 45, 00,000 + 5, 00,000 = 50, 00,000

Question 7

Let the operating profit of a manufacturer for five years given as:

Year	1	2	3	4	5	6
Operating profit {in lakh ₹}	90	100	106.4	107.14	120.24	157.35
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	100		107.11		107.00

Then the operating profit of Compound Annual Growth Rate (CAGR) for year 6 with respect to years 2 is given at

(a) 9%	(b) 12%
(c) 11%	(d) 13%

Answer: Options (b)

For CAGR we use very easy CI formula 90 + 12% + 12% + 12% + 12% 12% = 158.61 (Approx. 15.7)

Question 8

If discount rate is 14% per annum, then how much a company has to pay to receive ₹ 280 growing at 9% annually forever.

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(a) ₹ 5,600			(b) ₹ 2		
(c) ₹ 1,400			(d) ₹ 4	,200	
Answer: Options (a)	200				
$\frac{R}{i-g} = \frac{280}{0.14 - 0.09} =$	$\frac{280}{0.05} = 5$	600			
1 - g = 0.14 - 0.09	0.05				
Question 9 The effective rate of (a) 24%	return foi	r 24% per	annum con (b) 26		onthly is given as
(c) 18%			(d) 24	.24%	
Answer: Options (b)					
ER from Tricks	- 20/ - 20/	. 20/ . 20/	(. 20/ . 20/	. 20/
100 + 2% + 2% + 2% -	+ 2% + 2%) + 2% + 2%	% + Z% +Z%	+ 2% + 2%	+ 2% => 26.82%
Question 10					
	pe 12% pe	er annum,	then the ne	t present v	alue (in nearest₹) from the
given cash flow is given					_
Year	1	2	3	4	
Operating profit	(100)	()	40	FO	
{in thousand ₹} (a) 31048	(100)	60	40 (b) 34	50	
(c) 51048			(d) 24		
	Rs. 21,04	8/- by taki			option D is preferable
Answer: Options (d)	· ·		0		•
		-		in the sam	t at r% p.a. The same sum le time. What is the value of r?
-			-		compound interest on a sum of s compounded yearly?
(a) 135.75	it the rate	, or 10 /0 p.	(b) 12		s compounded yearly.
(c) 151.75			(d) 12		
Answer: Options (d)			(-)		
Question 13 The future value of a nearest ₹) as	nnuity of	₹ 2,000 fo	r 5 years at	5% compo	ounded annually is given (in
(a) 51051			(b) 02	021	
(c) 15624			(d) 61		
		(b 1-1			ntion C is Drofoushla
Note: Correct Ans is Answer: Options (c)	KS. 11,051	l/- by takin	ng the near	est value o	ption C is Preferable
					4. 44

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DEC 2021

Question 1

Mr. X wants to accumulate Rs. 50,000 at the end of 10 years. Then how much amount is required to invested every year if interest is compounded annually at 10%? (Given that P(10,0.10) = 15.9374298)

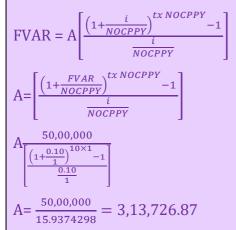
(a) Rs. 3,13,726.87

(c) Rs. 3,53,726.87

(b) 4,13,726.87 (d) 4,53,726.87

Answer: a

Explanation: Given FVAR = Rs 50,00,000; t= 10 years; i= 0.10; NOCPPY= 1; A=?



Ouestion 2

Rahul invested Rs 70,000 in a bank at the rate of 6.5% p.a. simple interest rate. He received Rs.85,925 after the end of term. Find out the period for which sum was invested by Rahul. (b) 3 years

(d) 2.5 years

(a) 2 years

(c) 3.5 yeras

Answer: c Explanation: Here, Principle (P) = 70,000

Rate (R) 6.5% p.a.

Amount (A) = 85,925, T= ?

S.I. A-P

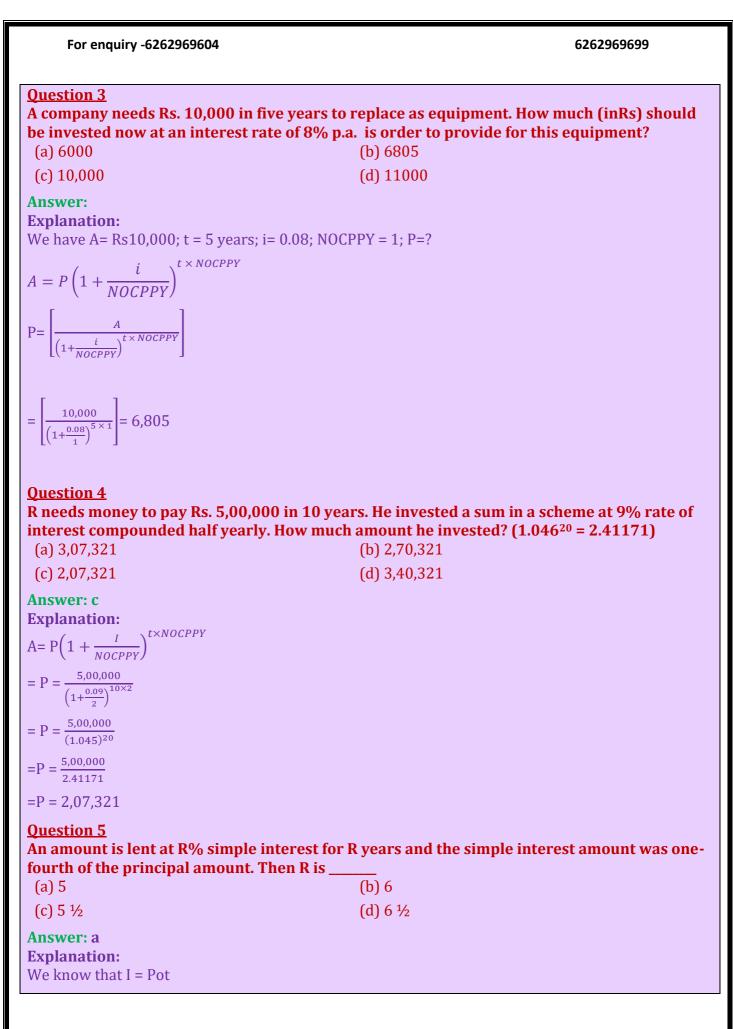
= 85,925 - 70,000

= 15,925

 $T = \frac{S.I.\times 100}{P \times R} = \frac{15,925 \times 1000}{7000 \times 6.5}$

=3.5 year.

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Given: I = $\frac{P}{4}$; $i = \frac{R}{100}$; t = R I = Pit $\frac{P}{4} = P \times \frac{R}{100} \times R$ $\frac{1}{4} = \frac{R^2}{100}$ $100 = 4R^2$ $R^2 = \frac{100}{4} = 25$ $R = \sqrt{25} = 5$

Question 6

A sum of money is put at 20% compound interest rate p.a. At which year the aggregated amount just exceeds the double of the original sum?

(a) 6		(b) 5
(c) 4		(d) 3

Answer: c Explanation: i=0.20; P=100; NOCPPY= 1; t=?

$$A = P \left(1 + \frac{I}{NOCPPY} \right)^{t \times NOCPPY}$$

Try the options.

Option (a) – 6

$$A = 100 \left(1 + \frac{0.20}{1}\right)^{6 \times 1} = 298.5894$$

Option (b) – 5

$$A = 100 \left(1 + \frac{0.20}{1}\right)^{3 \times 1} = 248.832$$

Option (c) – 4

$$A = 100 \left(1 + \frac{0.20}{1}\right)^{4 \times 1} = 207.36$$

Option (d) – 3

A=
$$100\left(1+\frac{0.20}{1}\right)^{3\times 1} = 172.8$$

Therefore, option (c) is the answer.

Question 7

The present value of an annuity of Rs. 25,000 to be received after 10 years at 6% per annum

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compounded annually is Rs _____. **(1.06⁵ = 1.33823)** (a) Rs. 15,960 (c) Rs. 11,960

(b)Rs. 13,960 (d) Rs. 17,960

Answer: b

Explanation:

The language of this question is wrong. The word "annuity" should not have been there. Also, the given information $(1.06^5 = 1.33823)$ is of no use.

A $= \frac{n}{\left(1 + \frac{A}{NOCPPY}\right)^{t \times NOCPPY}}$ P = - $P = \frac{25,000}{\left(1 + \frac{0.06}{1}\right)^{10 \times 1}}$ = P = 13,959.87 = 13,960 <u>**JUNE 2022**</u> **Ouestion 1** ₹ 2500 is paid every year for 10 years to pay off a loan. What is the loan amount if interest rate be 14% per annum compounded annually? (b) ₹ 13,040.27 (a) ₹ 15,841.90 (c) ₹ 14,674.21 (d) ₹ 14,010.90 **Answer: Options (a) Explanation**: Annuity (A) = 2,500n = 10yrs. R = 14% $I = \frac{R}{100} = \frac{14}{100} = 0.14$ Present value $\mathbf{V} = \frac{A}{i} \left[\frac{(1+i)^n - 1}{(1+0.14)^n} \right]$ $=\frac{2,500}{[(1+0.14)^{10}-1]}$ 0.14 (1+0.14)¹⁰ $= \frac{2,500}{(1.14)^{10}-1}$ 0.14 (1.14)¹⁰ = 2,500 [3.707221-1] 0.14 3.707221 $=\frac{2,500}{0.14}\times\frac{2.70721}{3.707221}$ = 13,040.27**Question 2** ₹ 200 is invested at the end of each month in an account paying interest 6% per year compounded monthly. What is the future value of this annuity after 10th payment? (b) ₹12,044 (a) ₹ 2,044

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(c) ₹ 2,040

(d) ₹ 12,000

(b) 8 year

(d) 10 year

Answer: Options (a) Explanation: Given Annuity (A) = ₹ 200 n = 10, R = 6% p.a. $i = \frac{6}{12}$ % per month i = 0.005Future value A(n, i) = $\frac{A}{i}[(1 + i)^n] - 1$ $= \frac{200}{0.005}[(1 + 0.005)^{10}] - 1$ $= \frac{200}{0.005}[1.0511] - 1$ $= 200 \times 10.22$ = ₹ 2,044

Question 3

In How much time a sum of amount doubles at simple interest at 12.5% rate?

(a) 7 year

(c) 9 year

Answer: Options (b)

Explanation:

Let Principal (P) = 100 (A) = 200 (R) = 12.5% T =? S.I = A - P = 200 - 100 = 100 (Time) T = $\frac{S.I \times 100}{P \times R} = \frac{100 \times 1000}{100 \times 12.5} = 8 years$

Question 4

Anshika took a loan of ₹ 1,00,000 @ 8% for 5 years. What amount will she pay if she wants to pay the whole amount in five equal instalments?

(a) ₹ 25,405.63	(b) ₹ 26,045.68
(c) ₹ 28,045.50	(d) None
Answer: Options (a)	
Explanation:	
V = 10000	

V = 10000 R = 8% $i = \frac{8}{100} = 0.08$ A = ?, n = 5Present Value $V = \frac{A}{i} \left[\frac{(1+i)^n - 1}{(1+i)^n} \right]$ $100000 = \frac{A}{0.08} \left[\frac{(1+0.08)^5 - 1}{(1+0.08)^5} \right]$

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$[(1 08)^5 - 1]$	
$100000 \times 0.08 = A \left[\frac{(1.08)^5 - 1}{(1.08)^5} \right]$	
$8000 = \frac{A \times 0.469328}{1.469328}$	
1.469328 8000 = A × 0.319417	
$8000 = \frac{8000}{0.319417}$	
= 25,045.63	
Question 5	
Ankit invests ₹ 3,000 at the end of each quar	
years. What amount will be receive at the en (a) ₹ 71,200.20	(b) ₹ 71,104.83
(c) ₹ 7.,204.83	(d) None
Answer: Options (b)	
Explanation:	
Given Annuity (A) = 3000	
$R = \frac{7}{4}\% = 1.75\%$	
$R = \frac{7}{4}\% = 1.75\%$ $I = \frac{R}{100} = \frac{1.75}{100} = 0.0175$	
$1 - \frac{100}{100} - \frac{100}{100} - 0.0175$	
n = 5 years	
= 5 × 4 Quarter = 20 Quarter	
Future Value A _(n, i) $= \frac{A}{i} [(1+i)^n - 1]$	
$= \frac{3000}{0.0175} [(1+0.0175)^{20}]$	– 1]
$= \frac{\frac{0.0175}{3000}}{0.0175} [(1.0175)^{20} - 1]$	
0.0175	
= 71,104.83	
Question 6	
	a normal rate of 7% p.a. convertible quarterly.
(a) 7%	(b) 7.5%
(c) 5%	(d) 7.18%
Answer: Options (d)	
Explanation:	
In interest is paid Quarterly	
$R = \frac{7}{4}\% = 1.75\%$	
4	
$T = 1$ years = 1×4 Quarterly = 4 Quarterly	
Effective Rate	
$E = \left[\left(1 + \frac{R}{100} \right)^T - 1 \right] \times 100$	
$= \left[\left(1 + \frac{1.75}{100} \right)^4 - 1 \right] \times 100$	
$= [(1 + 0.0175)^4 - 1] \times 100$	
$= [(1.0175)^4 - 1] \times 100$	
$= [1.0781 - 1] \times 100$	
$= 0.0781 \times 100$	
= 7.18%	

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Question 7

Assuming that the discount rate is 7% p.a. How much would pay to receive ₹ 200, rowing at 5% annually for ever?

(a) ₹ 2500	(b) ₹ 5000
(c) ₹ 7,500	(d) ₹ 10000
Answer: Options (d)	
Explanation:	
Discount rate (i) = 7% p.a = 0.07	
growing rate (g) = 5% annually = 0.05	
(R) = ₹200	

Present value of growing perpetuity

$$PVA = \frac{\frac{R}{i-g}}{\frac{200}{0.07-0.05}} = \frac{\frac{200}{0.02}}{\frac{200}{0.02}}$$

Question 8

A company establishes a sinking fund to provide for the payment ₹ 2,00,000 debt maturity in 20 years contribution to the fund are to be made at the end of every year. Find amount of each deposit of interest is 10% per annum?

(a) ₹ 3,592.11	- (b) ₹ 3,492.11
(c) ₹ 3.392.11	(d) None

Answer: Options (b) Explanation: $A_{(n,i)} = 2,00,000$ R = 10%, $i = \frac{10}{100} = 0.1$ $A_{(n,i)} = \frac{A}{i}[(1+i)^n - 1]$ $200000 = \frac{A}{0.1}[(1+0.1)^{20} - 1]$ $200000 \times 0.1 = A[(1.1)^{20} - 1]$ 20000 = A [6.7275 - 1] $20000 = A \times 5.7275$

 $20000 = A \times 5.7275$ $A = \frac{20000}{5.7275},$ A = 3492.11

Question 9

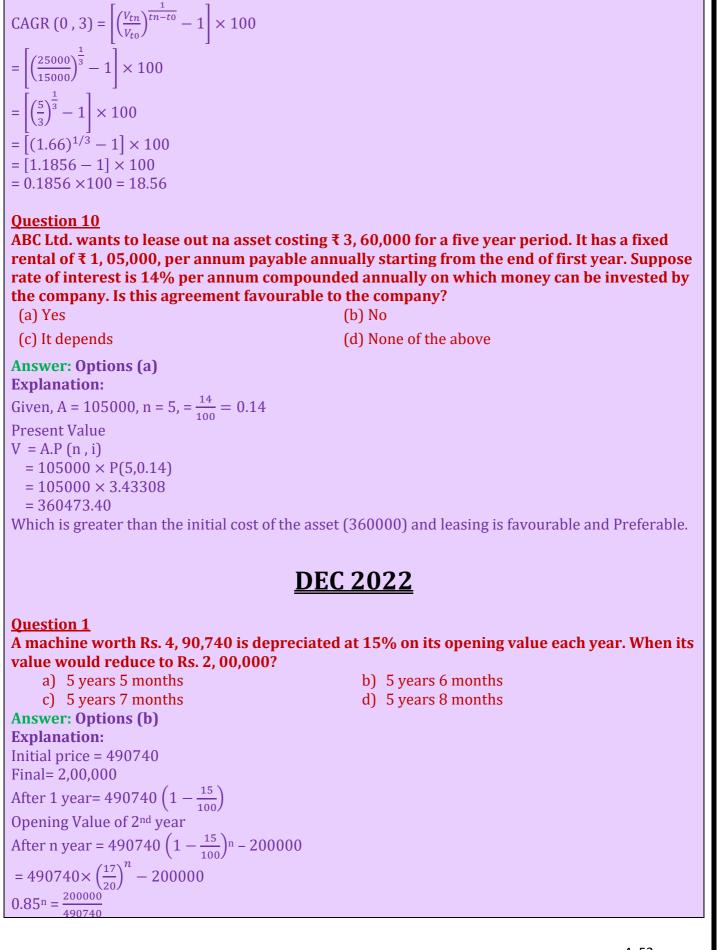
The CAGR of initial value of a investmer	nt of ₹ 15,000 and final value of ₹ 25,000 in 3 years is:
(a) 19%	(b) 18.56%
(c) 17.56%	(d) 17%
Anguar Ontions (b)	

Answer: Options (b) Explanation: Initial value (V_{t0}) = 15000 Final Value (V_{tn}) = 25000 $T_n - t_0 = 3$

 $l_n - t_0 = 3$

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 $0.85^{n} = 0.407$ $n \log 0.85 = \log 0.407$ $n = \frac{\log 0.407}{\log 0.85}$ n= 5.5318 n = 5 Years 6 months **Ouestion 2** If Rs. 64 Amount to Rs. 83.20 in 2 years, what will Rs. 86 Amount to in 4 years at the same **Rate percent per annum?** a) Rs. 137.60 b) Rs. 147.60 c) Rs. 145.34 d) Rs. 117.60 **Answer: Options (b) Explanation**: P₁₌Rs.64A₁=83T₁=2 Let Rate be R. $A = P\left(1 + \frac{RT}{100}\right)$ 83.2 = 64 $\left(1 + \frac{2R}{100}\right)$ $\frac{83.2}{64} = 1 + \frac{2R}{100}$ Rate = 15% Now, $P_2 = 86$ T₂=86 R= 15% $A = P\left(1 + \frac{RT}{100}\right)$ $A = 86\left(1 + \frac{15 \times 4}{100}\right)$ A= 137.60 **Question 3** Raju invests Rs. 20,000 every year in a deposit scheme staring from today for next 12 years. Assuming that interest rate on this deposit is 7% per annum compounded annually. What will be the future value of this annuity? Given that $(1 + 0.07)^{12} = 2.25219159$. b) Rs. 382,813 a) Rs. 540,526 d) Rs. 357,769 c) Rs. 643,483 **Answer: Options (b) Explanation**: By Trick: (167) × = = | 13 | $-1 \div 0.7$ = Rs. 382,813 **Ouestion 4** Mr. A invested Rs. 10,000 every year for next for 3 years at the interest rate of 8 percent per annum compounded annually. What is future value of the annuity? a) 32644 b) 32464 c) 34264 d) 36442 join our telegram channed of Content of the quiz group

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Answer: Options (b) Explanation:

Step-1: Calculate future value as though it is an ordinary annuity Future value of the annuity as if it is an ordinary annuity =10,000[(1+0.08)³-1]/ 0.08 =10,000× 0.2597 =Rs. 2597.12 Step-2: Multiply the result by (1+i) =32464

Question 5

Mr. Prakash invested money in two schemes 'A' and 'B' offering compound interest at the rate of 8% and 9% per annum respectively. If the total amount of interest accrued through these two schemes together in two years was Rs. 4818.30 and total amount invested was Rs. 27,000. What was the amount invested in scheme 'A'?

a) Rs. 12,000	b) Rs. 12,500
c) Rs. 13,000	d) Rs. 13,500
Answer: Options (a)	
Explanation:	
Rs (27000–x)	
$\therefore x \left(1 + \frac{8}{100}\right)^2 - 1 + (27000 - x) \left(1 + \frac{9}{100}\right)^2 - 1$	1 = 4818.30
$\Rightarrow \left(x + \frac{104}{625}\right) + \frac{1881(27000 - x)}{10000} = \frac{481830}{100}$	
⇒1664x+1881(27000-x)=48183000	
⇒(1881x-1664x) =50787000 - 48183000	
Or 217x=2604000	
Or x=12000Rs	

Question 6

A sum of money invested of compound interest doubles itself in four years. In how many years it becomes 32 times of itself at the rate of compound interest.

b) 16 yearsd) 24 years

a)	12 years
c)	20 years
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Answer: Options (c) Explanation:

$$A = P \left(1 + \frac{R}{100} \right)^{T}$$

$$2x = x \left(1 + \frac{R}{100} \right)^{4}$$

$$2 = \left(1 + \frac{R}{100} \right)^{4}$$

$$1 + \frac{R}{100} = 2^{1/4}$$

$$32x = x \left(1 + \frac{R}{100} \right)^{T}$$

$$\therefore 1 + \frac{R}{100} = 2^{1/4}$$

$$\therefore 32 = 2^{T/4}$$

$$2^{5} = 2^{T/4}$$

$$5 = T/4$$

$$T = 5 \times 4$$

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T = 20 Years

Therefore, in 20 years the principal amount will becomes 32 times to itself.

Ouestion 7

A farmer borrowed Rs. 3600 at the rate of 15% simple interest per Annum. At the end of 4years, he cleared this account by paying Rs. 4000 and a cow. The cost of the cow is: b) Rs. 1200

d) Rs. 1760

b) Rs. 24385.85

d) Rs. 28362.75

- a) Rs. 1000
- c) Rs. 1550

Answer: Options (d)

Explanation:

SI for 4 years = Rs. $(3600 \times 15 \times 4)/100$ = Rs.2160 Amount after 4 years = Rs. (3600+2160)= Rs. 5760 Cost of goat = Rs. (5760-4000) = Rs. 1760

Question 8

How much amount is required to be invested ever year so as to accumulate Rs. 5,00,000 at the end of 12 years if interest is compounded annually at 10%? (Where A (12, 0.1) = 21.384284)

a) Rs. 23381.65

c) Rs. 26381.65

Answer: Options (a)

Explanation:

Bv Trick: $(1.1) \times = 13$ $1 \div 0.1 \div = 5,00,000$

= Rs. 23381.65

Ouestion 9

The effective annual rate of interest corresponding to a normal rate of 6% per annum payable half yearly is:

a) 6.06%	b)	6.07%
c) 6.08%	d)	6.09%

Answer: Options (d)

Explanation:

Amount of Rs.100 for 1 year when compounded half yearly}

 $= \operatorname{Rs} \left[100 \times \left(1 + \frac{3}{100} \right)^2 \right] = \operatorname{Rs.106.09}$

: Effective rate = (106.09 - 100)% = 6.09%

Ouestion 10

10 years ago the earning per share (EPS) of ABC Ltd. was Rs. 5 share. Its EPS for this year is Rs. 22. Compute at what rate, EPS of the company grow annually?

- a) 15.97%
- c) 18.64%

- b) 16.77%
- d) 14.79%

Answer: Options (b)

Explanation: By option b 5+ 16.77% +16.77% +16.77% +16.77% +16.77% +16.77% +16.77% +16.77% +16.77% = 23Approx

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6262969699 For enquiry -6262969604 So, 16.77% is answer **Ouestion 11** The difference between compound interest and simple interest on an amount of Rs. 15,000 for 2 years is Rs. 96. What is the rate of interest per annum? a) 9% b) 8% c) 11% d) 10% **Answer: Options (b) Explanation**: $15000 \times \left(1 + \frac{R}{100}\right)^2 - 15000 - \left(\frac{15000 \times R \times 2}{100}\right) = 96$ = R = 8%**Ouestion 12** Rs. 5,000 is invested every month end in an account paying interest @ 12% per annum compounded monthly. What is the future value of this annuity just after making 11th payment? (Given that $(1.01)^{11}=1.1156$) a) Rs. 57,800 b) Rs. 56,100 c) Rs. 56,800 d) Rs. 57,100 **Answer: Options (a) Explanation**: A=Rs. 5000 n=11 i=12% p.a. =12/12% per month =0.010 Future value of annuity after 10 months is given by $A(n, i) = A\left[\frac{(1+i)^n - 1}{i}\right]$ $A(11, 0.010) = 5000 \left[\frac{(1+0.010)^{11}-1}{0.010} \right]$ = Rs. 57,800 **Question 13** A sum of money doubles itself in 4 years at certain compound interest rate. In how many years this sum will becomes 8 times at same compound interest rate? a) 12 years b) 14 years c) 16 years d) 18 years **Answer: Options (a) Explanation**: $A = P\left(1 + \frac{R}{100}\right)^2$ $2x = x \left(1 + \frac{R}{100}\right)^2$ $\left(1 + \frac{R}{100}\right) = 2^{1/4}$ $8x = x \left(1 + \frac{R}{100}\right)^2 \left(1 + \frac{R}{100}\right) = 2^{1/4}$ $8x = 2^{t/4}$

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 $2^3 = 2^{t/4}$

T/4 = 3 T= 12 Years

Question 14

Sinking fund factor is the reciprocal of :

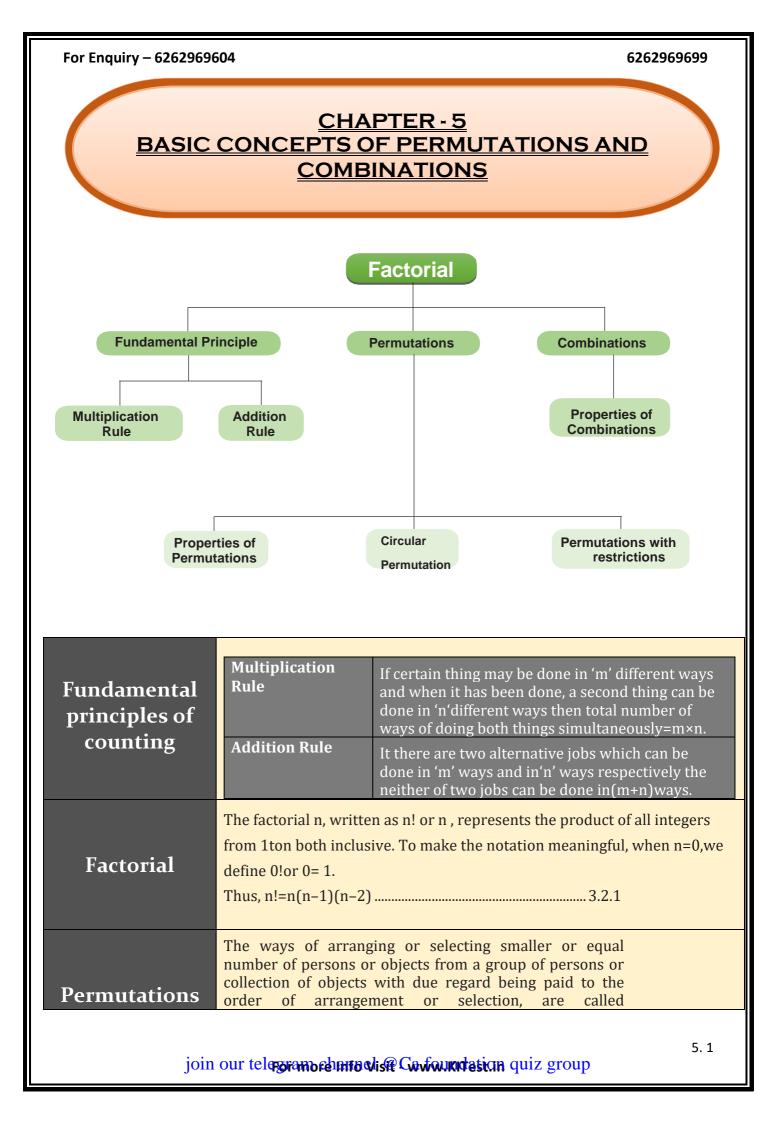
- a) Present value interest factor of a single cash flow
- c) Future value interest factor of an annuity

Answer: Options (b)

Explanation:

- b) Present value interest factor of an annuity
- d) Factor value interest factor of a single cash flow

The present value interest factor of an annuity is used to calculate the present value of a series of future annuities



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	permutations.
	The number of permutations of n things chosen r at a time is given by
	${}^{n}P_{r} = n(n-1)(n-2)(n-r+1)$
	Where the product has exactly r factors.
	(a)n ordinary permutations equal one circular permutation.
Circular	Hence there are ${}^{n}P_{n}/n$ ways in which all the <i>n</i> things can be arranged in a circle. This equals $(n-1)!$.
Permutations	(b) The number of necklaces formed with n beads of different colors
	• Number of permutations of n distinct objects taken r at a time when a particular object is not taken in any arrangement is $n-1p_r$.
	• Number of permutations of r objects out of n distinct objects when a particular object is always included in any arrangement
	The number of ways in which smaller or equal number of things are arranged or selected from a collection of things where the order of selection or arrangement is not important, are called combinations.
Combinations	${}^{n}C_{r} = n!/r! (n - r)!$
	${}^{n}C_{r} = {}^{n}C_{n-r}$
	${}^{n}C_{0} = n!/\{0! (n-0)!\} = n! / n! = 1.$
	${}^{n}C_{n} = n! / \{n! (n-n)!\} = n! / n! \cdot 0! = 1.$
	ⁿ C _r has a meaning only when r and n are integers $0\mathbb{Z}$ r \mathbb{Z} n and ⁿ C _{n-r} has a meaning only when $0\mathbb{Z}$ n-r \mathbb{Z} n.
	• $n+1C_r = nC_r + nC_{r-1}$
	• $nP_r = n - 1P_r + r^{n-1}P_{r-1}$
	Permutations when some of the things are alike, taken all at atime
Permutations	Permutations when each thing may be repeated once, twice, up tor times in any arrangement $=n!$.
	The total number of ways in which it is possible to form groups by taking some or all of n things $(2^{n}-1)$.
	The total, number of ways in which it is possible to make groups by taking some or all out of n $(=n_1 + n_2 + n_3 +)$ things, where n_1 things are alike of one kind and so on, is given by
	given by

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$\{(n_1 + 1) (n_2 + 1) (n_3 + 1)...\} - 1$

The combinations of selecting r_1 things from a set having n_1 objects and r_2 things from a set having n_2 objects where combination of r_1 things, r_2 things are independent



Question 1

An examination paper consists of 12 questions divided into parts A and B Part A contains 7 questions and part B contains 5 questions. A candidate is required to attempt 8 questions selecting at least 3 from each part. In how many maximum ways can the candidate select the question?

1	
(a) 35	(b) 175
(c) 210	(d) 420

Answer: d

Explanation:

The candidate can select 8 questions by selecting at last " three from each part in the following ways:

3 questions from part A and 5 questions from part B = $7_{C_3} \times 5_{C_5}$ = 35 ways

4 questions from part A and part B each

 $= 7_{C_4} \times 5_{C_4} = 175$ Ways.

Questions from part A and 3 questions from part B = $7_{C_5} \times 5_{C_3} = 210$ ways Hence, the total number of ways in which the candidate can select the question will be = 35 + 175 + 210 = 420 ways

Question 2

Code word is to consist of two English alphabets followed by two distinct numbers between 1 and 9. How many such code words are there?

(a) 6,15,800 (c) 7,19,500 (b) 46,800 (d) 4,10,800

Answer: b

Explanation:

The number of ways filling the first two places with English alphabets = $26 \times 25 = 650$ The number of ways of filling the last two places with distinct numbers = $9 \times 8 = 72$ The numbers of code words that can be formed are = 650×72 = 46800

Question 3

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not want to borrow Mathematics part – II In how many ways can he choose the thre	
(a) 41 (c) 61	(b) 51 (d) 71
Answer: a	(u) / I
Explanation: There are two cases possible CASE 1: When Mathematics Part – II is borro been borrowed Numbers of ways = 6_{C_1} = 6 ways	owed (i.e. it means Mathematics Part – I has also orrowed (i.e. 3 books are to be selected out of 7)
<u>Question 4</u> Find 5!, 4! And 6!	
(a) 720	(b) 120
(c) 380	(d) 620
Answer: a	
Explanation:	
$5! = 5 \times 4 \times 3 \times 2 \times 1 = 120: 4! = 4 \times 3 \times 2 \times 1$	$= 24; 6! = 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 720$
Question 5 Find $\frac{9!}{6!}$; $\frac{10!}{7!}$ (a) 630,504 (c) 920,630 Answer: b Explanation: $\frac{9!}{6!} = \frac{9 \times 8 \times 7 \times 6!}{6!} = \frac{9 \times 8 \times 7}{7!} = \frac{504}{7!}$; $\frac{10!}{7!} = \frac{10 \times 9 \times 8 \times 7!}{7!} = 10 \times 9 \times 8 = 720$	(b) 504,720 (d) 121,720
Question 6	
Find x if $\frac{1}{9!} + \frac{1}{10!} = \frac{x}{11!}$	
(a) 121	(b) 112
(c) 211	(d) 111
Answer: a	
Explanation:	
We have, $1 x$	
$\frac{1}{9!} + \frac{1}{10!} = \frac{x}{11!}$	
→ ¹ / _{9!} + ¹ / _{10×9!} = ^x / _{11×10×9!} → ¹ / _{9!} [1 + ¹ / ₁₀] = (^x / _{11×10}) × ¹ / _{9!}	
→ $1 + \frac{1}{10} = \frac{x}{11 \times 10}$	
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 $\Rightarrow \frac{11}{10} = \frac{x}{11 \times 10}$

→ X = 11 × 11 = 121

Question 7

Evaluate each of 5_{P_3} , 10_{P_2} , 11_{P_5} (a) 540 (b) 55440 (c) 5440 (d) 5540 Answer: b Explanation: $5_{p_3} = 5 \times 4 \times (5 - 3 + 1) = 5 \times 4 \times 3 = 60.$ $10_{p_2} = 10 \times \times (10 - 2 + 1) = 10 \times 9 = 90$ $11_{p_5} = \frac{11!}{(11 - 5)} = 11 \times 10 \times 9 \times 8 \times 7 \times \frac{6!}{6!} = 11 \times 10 \times 9 \times 8 \times 7 = 55440$

Question 8

How many three letters words can be formed using the letters of the word SQUARE?

(a) 110	(b) 12
(c)120	(d) 210
Answer: c	

Explanation:

Since the word 'SQUARE' consists of 6 different letters, the number of permutations of choosing 3 letters out of six equals $6_{P_3} = 6 \times 5 \times 4 = 120$

Question 9

In how many different ways can five persons stand a line for a group photograph?(a) 110 ways(b) 120 ways(c) 130 ways(d) 20 waysAnswer: bExplanation:Here we know that the order is important, hence this is the number of permutation ofn five things taken all at a time. Therefore, this equals $5_{P_5} = 5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$ ways.

Question 10

How many three letters words can be formed using the letters the word HEXAGON?	
(a) 110	(b) 12
(c) 120	(d) 210
Answer: d	
Explanation :	
Since the word '	HEXAGON' contains 7 different letters, the number of permutations is $7_{P_3} = 7 \times$
6 × 5 = 210.	

<u>Question 11</u> First, second and third are to be awarded at an engineering fair in which 13 exhibits have been entered. In how many different?

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(a) 1110 ways (c) 1830 ways Answer: d	(b) 1320 ways (d) 1716 ways
receive more than one prize. Hence the	d repetitions are not meaningful as no exhibit can answer is the number of permutations of 13 things d $13_{P_3} = \frac{13!}{10!} = 13 \times 12 \times 11 = 1,716$ ways
	- 5 10!
	Idents be associated with 4 chartered accountants,
assuming that each chartered accour	
(a) 10 (c) 20	(b) 12 (d) 24
Answer: d	(4) 21
Explanation:	
This equals the number of permutation $4_{p_3} = 4 \times 3 \times 2 = 24$.	s of choosing 3 persons out of 4, hence the answer is
Question 13	
	which can be formed with the four digits 1, 3, 5, 7, if
each digit is used only once in each a	•
(a) 1,06,656	(b) 1,46,800
(c) 7,19, 500 Answer: a	(d) 4,10,800
Explanation:	
÷	ent digits taken 4 at a time is given by $4_{p_A} = 4! = 24$. All
	of times at each of the positions, namely ones, tens,
Thus, each digit will occur $\frac{24}{2}$ = 6 times i	n each of the positions. The sum of digits in one's
	nilar is the case in ten's, hundred's and thousand's
<u>Ouestion 14</u>	
In how many different ways can a clu and Treasurer, if no member can hol	ib with 10 members select a President, Secretary d two offices and each member is eligible for any
office?	
(a) 720 (c) 960	(b) 780 (d) 630
Answer: a	(u) 050
Explanation:	
-	ons of 10 persons chosen three at a time.
Question 15	
	has eight shops to see, but he has time only to visit ays can he arrange her schedule in New York?
(a) 20,160	(b) 2016
(c) 26105	(d) 21560
to the second state of the	5.6

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Answer: a

Explanation:

She can arrange his schedule in $8_{P_6} = 8 \times 7 \times 6 \times 5 \times 4 \times 3 = 20,160$ ways

Question 16

When Dr. Ramanujan arrives in his dispensary, he finds 12 patients waiting to see him. If he can see only one patient at a time. Find the number of ways; he can schedule his patients if they all want their turn.

(a) 479001600 (c) 34879012

(b) 79833600 (d) 67800983

Answer: b Explanation:

There are 12-3 = 9 patients. They can be seen $12_{P_9} = 79,833,600$ ways.

Question 17

How many arrangements can be made out of the letters of the word 'DRAUGHT' the vowels never beings separated?

(a) 1440	(b) 720
(c) 740	(d) 750
Answer: a	

Explanation:

The word 'DRAUGHT' consists of 7 letters of which 5 are consonants and two are vowels. In the arrangement we are to take all the 7 letters but the restriction is that the two vowels should not be separated.

We can view the two vowels as one letter. The two vowels A and U in this one letter can be arranged in 2! = 2 ways. (i) AU or (ii) UA. Further, we can arrange the six letters: 5 consonants and one letter consisting of two vowels. The total number of ways of arranging them is $6_{P_6} = 6! = 720$ ways.

Hence, by the fundamental principle, the total number of arrangements of the letters of the word DRAUGHT, the vowels never being separated = $2 \times 720 = 1440$ ways.

Question 18

An examination paper with 10 questions consists of 6 questions in mathematics and 4 questions in statistic part. At least one question from each part is to be attempted in how many ways can this be done?

(a) 1024	(b) 945
(c) 1000	(d) 1022
Answer: b	
Explanation:	
Total question = 10	
No. of Mathematics questions = 6 No. of statics questions = 4 .	
No. of ways at least one question of Mathematics	
$= (2^6 1) = (64 - 1) = 63$	
No. of ways at least one question of statics	
$= (2^4 1) = (16 - 1) = 15$	
Total no. of ways = 63 × 15 = 945	

Questions 19

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For Enquiry - 6262969604 6262969699 A student has three books on computer, three books on Economics and five books on Commerce. If these books are to be arranged subject wise, then these can be placed on a shelf in the number of ways: (b) 25092 (a) 25290 (c) 4320 (d) 25920 Answer: d **Explanation**: No. of ways = 3! 3! 5! 3! $= 6 \times 6 \times 120 \times 6$ $= 216 \times 120$ = 25,920 **Ouestions 20** A person has ten friends of whom six are relatives. If h invites five guests 'SUCH' that three are his relatives, then the total number of ways in which he can invite then are: (a) 30 (b) 60 (c) 120 (d) 75**Answer: c Explanation**: Total friend: 10 No. of Relative = 6No. of friend = 4No. of ways to invite five guests such that three of them are his relatives. $= 6_{C_3} \times 4_{C_2}$ $=\frac{6!}{3!\times 3!}\times \frac{4!}{2!\times 2!}$ $20 \times 6 = 120$ **Ouestions 24** Six seats of articled clerks are vacant in a 'Chartered Accountant Firm'. How many different batches of candidates can be chosen out of ten candidates? (a) 216 (b) 210 (d) 230 (c) 220 **Answer: b Explanation**: The number of ways in which 6 articled clerks can be selected out of 10 candidates $= 10_{C_6} = 210$ ways. **Ouestion 25** Six persons A, B, C, D, E and F are to be seated at a circular table. In how many ways can this be done, if A must always has either B or C on his right and B must always have either C or D on his right? (a) 3 (b) 6 (c) 12 (d) 18 Answer: d **Explanation**: Using the given restrictions, we must have AB or AC and AB or BD Therefore, we have the following alternatives ABC, D, E, F, which gives (4 - 1)! Or 3! Ways.

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ABC, D, E, F which gives (4 - 1)! Or 3! Ways. AC, BD, E, F, which gives (4 - 1) or 3! Ways. Hence, the total number of ways are = 3! + 3! + 3!= 6 + 6 + 6 = 18 ways

Question 26

A fundamental principle of counting is:(a) $m \times n, m - n$ (b) $m \times n, m + n$ (c) $m + n, m \div n$ (d) $m \div n, m - n$ Answer: bExplanation:

Fundamental principles of counting

a. Multiplications Rule: m × n

b. Addiction Rule: m + n

Question 27

If $n_{c_r} = n_{c_{r-1}}$ and n_{P_r} and $n_{P_{r+1}}$, then the value of n is 27. (a) 3 (b) 4 (c) 2 (d) 5 Answer: a Explanation: The conditions provided that $n - r = r - 1 \rho r = \frac{n+1}{2}$ so if We put n = 3, then r = 2 satisfies the conditions

Question 28

$n_{P_r} \div n_{C_r} =$	
(a) n!	
(c) 48	
Answer: d	
Explanation:	

Question 29

The number of ordered triplets of positive integers which are solutions of the equation x+y+z = 100 is (a) 6005 (b) 4851 (c) 5081 (d) none of these Answer: b Explanation: The number of triplets of positive integers which re solutions of $X + y + z = 100 = \text{coefficient of } x^{100} \text{ in } (x + x^2 + x^3 + \dots)^3$ $= \text{coefficient of } x^{100} \text{ in } x^3(1 - x)^{-3} = \text{coefficient of } x^{100} \text{ in}$ $X^3 (1 + 3x + 6x^2 + \dots) + \frac{(n+1)(n+2)}{2}x^n + \dots)$ $= \frac{(97+1)(97+2)}{2} = 49 \times 99 = 4851$

(b) (n - r)! (d) r!

Question 30

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The number of way to sit 3 men and men and women on each side is 3	2 women in a bus such that total number of sitted
(a) 5!	(b) $6_{c_5} \times 5!$
(c) $6! \times 6_{P_5}$	(d) 5! + 6_{C_5}
Answer: b	
Explanation:	
3 men and 2 women equal to 5. A group	p of 5 members make 5! Permutations with each other. = 5! 6 places are filled by 5 members by 6_{C_5} ways. The on 6 seats of a bus = $6_{C_5} \times 5!$
Question 31	
If $P(n, r) = 1680$ and $C(n, r) = 70$, then	
(a) 128	(b) 576
(c) 256	(d) 625
Answer: b	
Explanation:	
P (n, r) = $1680 \frac{n!}{(n-r)!} = 1680?$ (i) C (n,	
$\frac{n!}{r!(n-r)!}$ = 70? (ii) $\frac{1680}{r!}$ = 70. [From (i) and	ıd (ii)]
$r! = \frac{1680}{70} = 24\rho r = 4 : P(n, 4) = 1680:$	
$n(n-1)(n-2)(n-3) = 1680 \rho n = 8$	
$8 \times 7 \times 6 \times 5 = 1680 + r! = 69 \times 8 + 4! =$	552 + 24
= 576	552 + 24
Number of divisors of n = 38808 9ee (a) 70 (c) 72 Answer: a Explanation: Since $38808 = 8 \times 4851$ $8 \times 9 \times 539 = 8 \times 9 \times 7 \times 7 \times 11 = 2^3 \times 3^2 \times 7^2 \times 12^3$ Number of divisors = $(3 + 1) (2 + 1) ($	(b) 68 (d) 74 11 + 1) (1 + 1) = 72. This includes two divisors 1 and
1	
Question 33	
	t at a round table so that the president and secretary
always sit together, then the number	0
(a) 10! × 2	(b) 10!
(c) 9! × 2	(d) None of these
Answer: c	
Explanation:	
Required number of ways 9! × 2 (by fu	ndamental property of Circular permutation).
Question 34	
In how many ways can 5 keys be put	
(a) $\frac{1}{2}$ 4!	(b) $\frac{1}{2}$ 5!
(c) 4!	(d) 5!
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Answer: a

Explanation: Mark the keys as 1, 2, 3, 4, 5 Assume the ring as a circle with 5 positions. First position can be taken by any one of them. The 2^{nd} positions has 4 possibility, 3^{rd} has 3, 4^{th} has 2, 5^{th} has 1 Totally $4 \times 3 \times 2 \times 1 = 24$.

Question 35

A question paper is divided into two parts A and B and each part contains 5 questions. The number of ways in which a candidate can answer 6 questions selecting at least two questions from each part is

(a) 80 (c) 200

Answer: c

(b) 810(d) None of these

Explanation:

The number of ways that the candidate may select 2 questions from A and 4 from $B=5_{C_2} \times 5_{C_3}$ 4 questions from A and 2 from $B=5_{C_4} \times 5_{C_2}$. Hence total numbers of ways are 200.

Question 36

How many number lying between 10 and 1000 can be formed from the digits 1, 2, 3, 4, 5, 6, 7, 8, 9 (repetition is allowed)

(a) 1024	(b) 810
(c) 2346	(d) None of these
Answer: b	

Explanation:

The total number between 10 and 1000 are 989 but we have to form the numbers by using numerals 1, 2,.....9, i.e. 0 is not occurring so the numbers containing any 0? would be excluded i.e., Required number of ways

 $= 989 - \begin{cases} 20, 30, 40, \dots, 100 = 9\\ 101, 102, \dots, 300 = 19\\ 201, \dots, 300 = 19\\ \dots, 901, \dots, 990 = 18 \end{cases}$

= 989-(9+18+19×8) = 810. Alter: Between 10 and 1000, the numbers are of 2 digits And 3 digits. Since repetition is allowed, so each digit can be filled in 9 ways. Therefore number of 2 digit numbers = $9 \times 9 = 81$ and number of 3 digit numbers $9 \times 9 \times 9 = 729$. Hence total ways = 81 + 729 = 810

Question 37

The number of ways in which the letters of the word TRIANGLE can be arranged such that two vowels do not occur together is

(a) 1200 (c) 14400 **Answer: c Explanation:** (b) 2400(d) None of these

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·T·R·N·G·L Three vowels can be arrange at 6 places in 6_{P_3} = 120 ways. Hence the required number of arrangements = $120 \times 5! = 14400$

Question 38

There are four balls of different colours and four boxes of colours same as those of the balls. The number of ways in which the balls one in each box, could be such that a ball does not go to box of its own colour is

(b) 7

(b) 41

(d) none of these

(d) None of these

(a) 8 (c) 9 Answer: c Explanation:

Since the number of derangements in such a problems is given by

n! $\left\{1 - \frac{1}{1!} + \frac{1}{2!} - \frac{1}{3!} + \frac{1}{4!} \dots \dots \dots (-1)^n \frac{1}{n!}\right\}$ ∴ Number of derangements are = 4! $\left\{\frac{1}{2!} - \frac{1}{3!} + \frac{1}{4!}\right\}$ = 12-4+1 = 9

Question 39

If $56_{P_{r+6}}$: $54_{P_{r+3}}$ = 30800:1, then r = (a) 31 (c) 51 Answer: b Explanation: $\frac{56!}{(50-r)!} \times \frac{(51-r)!}{54!}$ $\frac{30800}{1}$ = $56 \times 55 \times (51-r)$ = 30800 r = 41

Question 40

The number of ways of dividing 52 cards amongst four players so that three players have 17 cards each and the fourth player just one card, is

(a) $\frac{52!}{(17!)^3}$	(b) $\frac{52!}{(17!)^2}$
(c) 52!	(d) none

Answer: a

Explanation:

For the first set number of ways $52_{C_{17}}$. Now out of 35 cards left 17 cards can be put for second in $35_{C_{17}}$ ways similarly for 3^{rd} in $18_{C_{17}}$. One card for the last set can be put in only one way.

Therefore the required number of ways for the proper distribution = $\frac{52!}{35!17!} \times \frac{35!}{18!17!} \times \frac{18!}{17!1!} \times \frac{18!}{18!1!} \times \frac{18!}{17!1!} \times \frac{18!}$

$$1! = \frac{52!}{(17!)^3}$$

Question 41

m men and n women are to be seated in a row so that no two women sit together. If m>n, them then the number of ways in which can be seated is

(a) $\frac{m!(m+1)!}{(m-n+1)!}$	(b) $\frac{m!(m-1)!}{(m-n+1)!}$
(c) $\frac{(m-1)!(m+1)!}{(m-n+1)!}$	(d) none

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Answer: a

Explanation:

First arrange m men, in arrow in m! Ways. Since n<m and no two women can sit together, in any one of the m! Arrangement, there are places in which n women can be arranged in m + 1_{P_n} _ m!(m+1)! _ m!(m+1)!

 $=\frac{m!(m+1)!}{[(m+1)-n)!}=\frac{m!(m+1)!}{(m-n+1)!}$

Question 42

The number of times the digit 3 will be written when listing the integers from 1 to 1000 is:

(a) 369	(b) 300
(c) 271	(d) 302

Answer: b

Explanation:

To find number of times 3 occurs in listing the integer from 1 to 999. (Since 3 does not occur in 1000). Any number between 1 to 999 is a 3 digit number xyz where the digit x, y, z are any digits from 0 to 9. Now, we first count the numbers in which 3 occurs once only. Since 3 can occur at one place in 3_{C_1} ways. There $\operatorname{are3}_{C_1}$. (9 × 9) + 3 × 1 = 300

Question 43

Ten persons, amongst whom are A, B, and c to speak at a function. The number of ways in which it can be done. If A wants to speak before B and B wants to speak before C is			
(a) $\frac{10!}{6}$	(b) $\frac{3!}{7!}$		
(c) 10_{P_3} .7!	(d) None of these		
Answer: a			

Explanation:

For A, B, C, to speak in order of alphabets 3 places out of 10 may be chosen first in 1. $3_{C_2} = 3$ ways. The remaining 7 persons can speak in 7! Ways. Hence, the number of ways in which all the 10 person can speak is 10_{C_3} . $7! = \frac{10!}{3!} = \frac{10!}{6}$

Question 44

How many words can be made out from the letters of the word INDEPENDENCE, in which
vowels always come together?(a) 16800(b) 16630(c) 1663200(d) None of theseAnswer: aExplanation:Required numbers of ways are $\frac{8!}{2!3!} \times \frac{5!}{4!} = 16800$. {Since IEEEENDPNDNC = 8 letters}.Question 45The exponent of 3 in 100! Is(a) 33(b) 44(c) 48(d) 52

Answer: c

Explanation:

Let E (n) denote the exponent of 3 in n. the greatest integer less than 100 divisible by 3 is 99. We have

E (100!) = E (1.2.3.4....99.100)

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= E (3.6.9....99)= E[(3, 1)(3, 2)(3, 3)....(3, 33)]= 33 + E (1. 2. 3.....33) Now E (1. 2. 3......33) =E (3. 6. 9....33) $= E[(3, 1) (3, 2) (3, 3) \dots (3, 11)]$ = 11+ E (1. 2. 311) And E(1.2.3...11) = E[(3.1)(3.2)(3.3)]3 + E(1.2.3) = 3 + 1 = 4 Thus E(100!) = 33 + 11 + 4 = 48

Ouestion 46

A dictionary is printed consisting of 7 lettered words only that can be made with a letter of the word CRICKET. If the words are printed at the alphabetical order, as in an ordinary dictionary, then the number of word before the word CRICKET is (a) 530 (b) 480 (d) 481 (c) 531 Answer: a **Explanation**: The number of words before the word CRICKET is $4 \times 5! + 2 \times 4! + 2! = 530$ **Question** 47 The number of positive integral solutions of abc = 30 is (a) 30 (b) 27 (c) 8 (d) none of these **Answer: b Explanation**: We have, $30 = 2 \times 3 \times 5$. So, 2 can be assigned to either a or b or c i.e. 2 can be assigned in 3 ways. Similarly, each of 3 and 5 can be assigned in 3 ways. Thus the no. of solutions is $3 \times 3 \times 3$ = 27. **Ouestion 48** The number of different words that can be formed out of the letters of the word 'MORADABAD' taken four at a time is (a) 500 (b) 600 (c) 620 (d) 626 Answer: d **Explanation:**

In MORADABAD, we have 6 different types of letters 3A^s, 2D^s and rest four different. We have to form words of 4 letters. (i) All letters $6_{P_4} = 6 \times 5 \times 4 \times 3 = 360$. (II) Two different two a like $2_{C_1} \times 5_{C_2} \times \frac{4!}{2!} = 240$ (iii) 3 alike 1 different $1_{C_1} \times 5_{C_1} \times \frac{4!}{2!} = 20$ (iv) 2 alike of one type and 2 alike of other type $2_{C_2} \times \frac{4!}{3!} = 6$ Therefore total number of words = 360 + 240 + 20 + 6 = 626

PREPARE FOR WORST

Ouestion 1

How many 3 letter words with or without meaning can be formed out of the letters of the word MONDAY when repetition of words is allowed?

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(a) 125 (c) 120	(b) 216 (d) 320	
Question 2		
In how many ways the letters in the wo (a) 120	(b) 40	
(c) 20	(d) 30	
<u>Type – 2</u> Question 1		
	vithout meaning, can be formed from the word	
(a) 43200	(b) 30240	
(c) 12032	(d) 36000	
Question 2 In how many different ways can the let the vowels always come together?	tters of the word 'LOGARITHMS' be arranged so that	
(a) 6720	(b) 241920	
(c) 40320	(d) 360344	
Question 3How many three digit numbers can be formed from the digits 3, 4, 5, 7, 8, and 9. Also, the number formed should be divisible by 5 and no repetition is allowed?(a) 20(b) 24		
(c) 25	(d)	
Type 3 Question 1		
An ice cream seller sells 5 different ice friends. In how many ways can he buy	e-creams. John wants to buy 15 ice creams for his the ice-cream?	
(a) 1450	(b) 3768	
(c) 3879	(d) 1540	
<u>Question 2</u> There are 5 types of soda flavor available selected?	ble in a shop. In how many ways can 10 soda flavors	
(a) 1454	(b) 1001	
(c) 1211	(d)1540	
<u>Type - 4</u> <u>Ouestion 1</u>		
A wooden box contains 2 grey balls, 3 j	pink balls and 4 green balls. Fins out in how many boden box. Make sure that at least one pink ball is	
included in the draw?		
(a) 64 (c) 56	(b) 46 (d) 65	
Question 2		
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There are 5 boys and 10 girls in a cla	assroom. In how many ways teacher can select 2 boys
and 3 girls to make a dance group?	
(a) 720	(b) 1200
(c) 240	(d) 840
Ouestion 3	
	els. Out of which how many words of 5 consonants and
2 vowels can be made?	, i i i i i i i i i i i i i i i i i i i
(a) 2520	(b) 1200
(c) 210	(d) 720
Ouestion 4	
· · ·	rmed from 6 men and 4 women. In how many ways can
this be done when at least 2 women	are included?
(a) 196	(b) 186
(c) 190	(d) 200
Ouestion 5	
	e arranged in all possible ways and these words are
written out as in dictionary, then the	e word 'SACHIN' appears at serial number:
(a) 601	(b) 600
(c) 603	(d) 602
Question 6	
	A 5-member team and a captain will be selected out of
these 10 players. How many differen	
(a) 1260	(b) 1400
(c) 1250	(d) 1600
Question 7	
	taneously, in how many outcomes will at least one of
the dice show 3?	
(a) 620	(b) 671
(c) 625	(d) 567
Question 8	
	each marked with six different letters. The number of
distinct unsuccessful attempts to op	
(a) 215	(b) 268
(c) 254	(d) 216
Ouestion 9	
	the word EDUCATION be rearranged so that the
	consonants remain the same as in the word
EDUCATION?	
(a) 4! x 4!	(b) 5! x 5!
(c) 4! x 5!	(d) 3! x 4!
Ouestion 10	
	5. 16

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	which 13 pass through the point A and 11	
	nes pass through one point, no lines passes	
intersection of the straight lines.	o are parallel. Find the number of points of	L
(a) 525	(b) 535	
(c) 545	(d) 555	
Question 11		
	in be formed (the words need not be mean	
using the letters of the word "MEDITERR letter is R?	RANEAN" such that the first letter is E and t	the last
(a) 59	(b) 56	
(c) 64	(d) 55	
Question 12		
	e packed in 3 identical boxes such that no	box is
empty, if any of the boxes may hold all of		
(a) 36 (c) 24	(b) 25 (d) 72	
	(0) / 2	
Question 13		
	pens and 4 red pens. In how many ways ca	n 2
black pens, 2 white pens and 2 red pens		
(a) 180	(b) 220 (c) 160	
(c) 240	(d) 160	
ANSWERS AVAILABLE ON:		
• TELEGRAM CHANNEL: t.me/KINSH	HUKInstitute	
• WEBSITE : WWW.KITest.IN		
• KITest APP		
الربالية المراجع المراجع		
PAST EXAMIN	ATION QUESTIONS:	
M	<u>AY 2018</u>	
Question 1		
—	d by choosing the vertices from a set of 12	points,
seven of which lie on the same straight lin		
(a) 185	(b) 175	
(c) 115 Answer: a	(d) 105	
Explanation:		
Here $n = 12$, $k = 7$		
No. of triangle are formed from 'n' point		
In which (k) points are collinear = n_{C_3} - k_{C_3}		
		5. 17

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 $= 12_{C_3} - 7_{C_3}$ = $\frac{12 \times 11 \times 10}{3 \times 2 \times 1} - \frac{7 \times 6 \times 5}{3 \times 2 \times 1}$ = 220-35 = 185

Question 2

If $1000_{C_{98}}$ + $999_{C_{97}}$ + $x_{C_{901}}$, find x: (a) 999 (c) 997 Answer: a Explanation: If $1000_{C_{98}} - 999_{C_{97}} + x_{C_{901}}$ $\therefore n_{C_r} + n_{C_{r-1}} = n + 1_{C_r}$ Then x = $999 [999_{C_{901}} + 999_{C_{98}}]$

(b) 998 (d) 1000

<u>NOV 2018</u>

Question 1

A bag contains 4 red, 3 black, and 2 white balls. In how many ways 3 balls can be drawn from his bag so that they include at least one black ball? (a) 64 (b) 46(c) 85 (d) None Answer: a Explanation: No. of total balls = 4 Red+3 Black + 2 white = 9 balls Total number of ways = $3C3 + (3C2 \times 6C1) + (3C1 \times 6C2)$ [because 6 are non black] = $1+[3\times6]+[3\times(6\times52\times1)]=1+18+45=64$

Ouestion 2 The number of words from the letter word BHARAT, in which B and H will never come together, is (a) 360 (b) 240 (c) 120 (d) None Answer: b **Explanation:** Given word 'BHARAT' 123456 Total No. of ways arrange the letter word = $\frac{6!}{2!} = \frac{720}{2} = 360$ If Letter 'B' and 'H' are never taken together = 360 - 120=240

Question 3

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The value of N in = $\frac{1}{7!} + \frac{1}{8!} + \frac{N}{9!}$ is	
(a) 81	(b) 78
(c) 89	(d) 64
Answer: a	
Explanation:	
$If\frac{1}{7!} + \frac{1}{8!} = \frac{N}{9!}$	
$9 \times 8 \times 1$ $ 9 \times 1$ $ N$	
$\frac{9 \times 8 \times 1}{9 \times 8 \times 7!} - \frac{9 \times 1}{9 \times 8!} = \frac{N}{9!}$ $\frac{72}{9!} + \frac{9}{9!} = \frac{N}{9!}$ $\frac{81}{9!} = \frac{N}{9!}$	
$\frac{72}{2} + \frac{9}{2} = \frac{N}{2}$	
9! 9! 9! 81 <i>N</i>	
$\frac{31}{9!} = \frac{1}{9!}$	
N = 81	
Ouestion 4	
$\overline{\text{If } n_{P_r}}$ =720, n_{P_r} = 120, then r is	
(a) 3	(b) 4
(c) 5	(d) 6
Answer: a	
Explanation:	
Given $n_{P_r} = 720$, $n_{C_r} = 120$	
We know that	
$\frac{n_{Cr}}{m} = \frac{1}{m}$	
<i>n_{Cr} r</i> 120 1	
$\frac{\frac{120}{720}}{\frac{1}{1}} = \frac{1}{r}$	
$\begin{array}{c} 1 \\ - = \end{array}$	
$\frac{1}{6} = \frac{1}{r}$	
R = 3	
	<u>MAY 2019</u>
Question 1	6 –
If $11_{C_r} = 11_{C_{2x-4}}$ and $x \neq 4$ then the value	
(a) 20	(b) 21
(c) 22	(d) 23
Answer: b	
Explanation: Equate bases of LHS and RHS	
So x=4	
Therefore, LHS = RHS	
11-x = 2x-4	
x=5	

 $7_{C_3} = 7_{C_2} = 21$

Question 2

Which of the following is not a correct statement? (a) $n_{P_n} = n_{P_{n-1}}$ (b) $n_{P_n} = 2.n_{P_{n-2}}$

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(c) $n_{P_n} = 3. n_{P_{n-3}}$	(d) $n_{P_n} = n. n. (n-1)_{P_{n-1}}$
Answer: d	
Explanation:	
LHS ≠ RHS	
In case of d option	
Question 3 How many words can be formed with the le not come together?	etter of the world "PARALLEL". So that all L's do
(a) 2000	(b) 3000
(c) 4000	(d) None of these
Answer: b	
Explanation:	
There are 8! ways of arranging the eight letter	s of "PARALLEL", but since there are three "L"s and
two "A"s, we must divide through by 3!×2! to g	get a total of $\frac{8!}{2!}$ permutations.
Okay, so how many of these have all three "L"s	51/21
$\frac{8!}{3!\times 2!} - 6 \times \frac{5!}{2!} = 3000$	
	ers. It includes 2 wicket keepers and 5 bowlers. In
	ected if we have to select 1 wicket keeper and
atleast 4 bowlers?	(h) 1000
(a) 1024 (c) 2000	(b) 1900 (d) 1092
Answer: d	(u) 1092
Explanation:	
	t keeper and 4 bowlers or, 1 wicket keeper and 5
bowlers.	
Number of ways of selecting 1 wicket keeper, $2_{C_1} \times 5_{C_4} \times 9_{C_6} = 840$	
Number of ways of selecting 1 wicket keeper, 5 Total number of ways of selecting the term = 8	5 bowlers and 5 other players in $2_{C_1} \times 5_{C_4} \times 9_{C_5} = 252$ 340 + 252 = 1092.
<u>NO</u>	<u>V 2019</u>
Question 1 Three girls and five boys are to be seated in ways of this arrangement are:	n a row so that no two girls sit together. Total no. of
(a) 14,400	(b) 120
(c) 5_{P_3}	(d) 3! × 5!
Answer: a	
Explanation:	
(a) Required arrangement	
X B ₁ X B ₂ X B ₃ X B ₄ X B ₅ X	
No. of ways of arranging 3 girls in 6 places	
$=5_{p_{3}}$	
ioin our talerram aborn	5.20

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Total ways = Pp3 x 3ps = $\frac{a}{(a-b)} \times 51$ = $\frac{a}{(a-b)} \times 51$ = $\frac{a}{(a-b)} \times 51$ How many numbers can be formed with the help of 2, 3, 4, 5, 6, 1 which is not divisible by 5, given that it is a five-digit no. and not repeating? (a) 600 (b) 400 (c) 1200 (c) 1400 Answer: a Explanation: (a) No's 2, 3, 4, 5, 6, 1. An o, is divisible by 5 when it ends with 0 or 5 TTHTTHH0 No. of ways of filling tone's digit = 5 No. of ways of filling ten's digit = 5 (a) 5 (b) 6 (c) 10 (d) 9 Answer: c Explanation: (c) We know, No. of ways to choose r objects out of n objects is "Cr Using the formula, Choosing 3 distinct objects (groups) from $5 = \frac{a}{(x-1)^{1/3}} = a$		
$=\frac{65254\times23}{31} \times 120 = \text{Rs. } 14,400$ Dustion 2 How many numbers can be formed with the help of 2, 3, 4, 5, 6, 1 which is not divisible by 5, given that it is a five-digit no. and not repeating? (a) 600 (b) 400 (c) 1200 (d) 1400 Answer: a Explanation: (a) No's 2, 3, 4, 5, 6, 1. An o, sd visible by 5 when it ends with 0 or 5 TTHTHHO No. of ways of filling tone's digit = 5 (all except 5) No. of ways of filling thousand place = 4 No. of ways of filling thousand place = 3 No. of ways of filling thousand place = 3 No. of ways of filling thousand place = 2 Total ways = 5 × 5 × 4 × 3 × 2 = 600 ways Question 3 How many different groups of 3 people can be formed from a group of 5 people? (a) 5 (b) 6 (c) 10 (d) 9 Answer: c Explanation: (c) We know, No. of ways to choose r objects out of n objects is "C. Using the formula, Choosing 3 distinct objects (groups) from $5 = 5(s = \frac{5!}{(5-3)w3} = \frac{5!}{(5-3)w3} = \frac{5!}{(5-3)w3} = \frac{5!}{(5-3)w3} = \frac{5!}{(2-3)w3} = \frac{5!}{(2-3$	Total ways = ${}^{6}p_{3} \times {}^{5}p_{5}$	
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(c) 1200 (d) 1400 Answer: a Explanation: (a) No's 2, 3, 4, 5, 6, 1. A no. is divisible by 5 when it ends with 0 or 5 THTHTH 0 No. of ways of filling one's digit = 5 (all except 5) No. of ways of filling thousand place = 4 No. of ways of filling thousand place = 3 No. of ways of filling the thousand place = 2 Total ways = $5 \times 5 \times 4 \times 3 \times 2$ = 600 ways Question 3 How many different groups of 3 people can be formed from a group of 5 people? (a) 5 (b) 6 (c) 10 (d) 9 Answer: c Explanation: (c) We know, No. of ways to choose r objects out of n objects is *C. Using the formula, Choosing 3 distinct objects (groups) from $5 = 5C_3 = \frac{5!}{(5-3)\times3} = \frac{5!}{2\times3!} = \frac$		
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$ \begin{array}{c} = 600 \text{ ways} \\ \hline \textbf{Ouestion 3} \\ \hline \textbf{How many different groups of 3 people can be formed from a group of 5 people?} \\ (a) 5 (b) 6 (c) 10 (d) 9 \\ \hline \textbf{Answer: c} \\ \hline \textbf{Explanation:} \\ (c) We know, \\ \hline \textbf{No. of ways to choose r objects out of n objects is "CrUsing the formula, \\ \hline \textbf{Choosing 3 distinct objects (groups) from} \\ 5 = 5C_3 = \frac{5!}{(5-3)!\times3} \\ = \frac{5!}{2!\times3!} \\ = 10 \text{ ways} \\ \hline \textbf{Ouestion 4} \\ \hline \textbf{In how many ways can 4 people be selected at random from 6 boys and 4 girls if there are exactly 2 girls? \\ (a) 90 (b) 360 (c) 92 (d) 480 \\ \hline \textbf{Answer: a} \\ \hline \textbf{Explanation} \\ \hline \textbf{(a) Boys (6) Girls (4)} \\ \hline \textbf{2} & 2 \end{array} $		
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$=\frac{5\times4\times3!}{2\times3!}$ =10 ways <u>Question 4</u> In how many ways can 4 people be selected at random from 6 boys and 4 girls if there are exactly 2 girls? (a) 90 (b) 360 (c) 92 (d) 480 Answer: a Explanation (a) Boys (6)Girls (4) <u>2</u> 2 5.21	$=\frac{1}{2!\times 3!}$	
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(a) 90 (c) 92 Answer: a Explanation (a) Boys (6) Girls (4) 2 2 5. 21		at random from 6 boys and 4 girls if there are
(c) 92 Answer: a Explanation (a) Boys (6)Girls (4) 2 2 5.21		
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(a) Boys (6)Girls (4) 2 2 5. 21		
2 2 5. 21		
	(a) Boys (6)Girls (4)	
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		_
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No. of ways of selecting 2 boys out of $6 = {}^{6}C_{2}$ No. of ways of selecting 2 girls out of $4 = {}^{4}C_{2}$ Total ways = ${}^{6}C_{2} \times {}^{4}C_{2}$ = $\frac{6!}{(6-2)! \times 2} \times \frac{4!}{21 \times (4-2)!}$ = $\frac{6 \times 5 \times 4!}{4! \times 2} \times \frac{4 \times 3 \times 2!}{2! \times 2}$ = $15 \times 6 = 90$ ways. Question 5 ⁿp₃ : ⁿp₂ = 2: 1 (a) 4 (c) 5 Answer: a Explanation: (a) ⁿp_r = $\frac{n!}{(n-r)!}$ ⁿP_r : ⁿP₂ = 2:1 $\frac{n!}{(n-3)!} : \frac{n!}{(n-2)!} = \frac{2}{1}$ $\frac{n!}{(n-3)!} \times \frac{(n-2)(n-3)!}{n!} = \frac{2}{1}$

<u>DEC 2020</u>

(b) 7/2

(d) 2/7

Question 15 If Np4 = 20 Np2 = where P denotes the number of permutations n =_____ (a) 4 (b) 2(d) 7 (c) 5 Answer: d **Explanation**: $n_{P_r} = \frac{n!}{(n-r)!}$ Here, $n_{P_4} = 20 n_{P_2}$ $=\frac{n!}{(n-4)!}=20=\frac{n!}{(n-2)!}$ (n-2)! = 20(n-4)!(n-2)(n-3)(n-4)! = 20(n-4)!(n-2)(n-3) = 20 $n^2 - 5n + 6 = 20$ $n^2 - 5n - 14 = 0$ $n^2 - 7n + 2n - 14 = 0$ n(n-7) + 2(n-7) = 0(n+2)(n-7) = 0If $n+2 = 0 \Rightarrow n = -2$ (Not possible) If $n-7 = 0 \Rightarrow n = 7$ Thus, the value of n is 7.

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Question 16	
	ples, 6 bananas and 4 mangoes. How many selections of 3 fruits
can be made so that all 3 are	
(a) 120 ways	(b) 35 ways (d) 70 ways
(c) 168 ways Answer: b	(d) 70 ways
Explanation: Given:	
Given: Number of Bananas = 6	
Number of Apples = 7	
Number of Mangoes = 4	a new provide a collection of finite from the backet
	a person make a selection of fruits from the basket.
	o or more bananas = $6 + 1 = 7$ ways
	o or more apples = $7 + 1 = 8$ ways
	o or more mangoes in $4 + 1 = 5$ ways
So, Total number of ways = $5x$	
	na, 0 apple and 0 mangoes, so we have to subtract this from total
number of ways, \rightarrow Number of ways,	270
\Rightarrow Number of ways = 280 - 1 =	
	e a selection of fruits from the basket is 279 ways.
\therefore 3 fruits can be made so that a	all 3 are apples is 35
Outstion 17	
Question 17 Out of 7 hove and 4 girls a to	are af a dahata slub of E is to be shoren. The number of teams
	eam of a debate club of 5 is to be chosen. The number of teams
such that each team include (a) 429	(b) 439
(a) 429 (c) 419	(d) 441
Answer: d	(u) 441
Explanation:	
The Team Consist of 4 girls +1	how
Number of selections $4_{C_3} \times 7_C$	
-	
Hence, the total number of tea	ams that can be formed = 140+210+84+7=441
Question 18	
	4 women, 4 persons are to be selected to form a committee so that
	on the committee. In how many ways can it be done?
(a) 201	(b) 168
(c) 202	(d) 220
Answer: a	(u) 220
Explanation:	
Total number of men = 8	
Total number of women = 4	
Committee = 4 persons \rightarrow at le	ast 2 women
Case $1 \rightarrow 2$ Women + 2 men	
Case 2 \rightarrow 3 women + 1 men	
Case $3 \rightarrow 4$ women + 0 men \rightarrow	
Total	<u>201</u>

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Question 1	
	o women and three men are to be seated by
-	en choose the chairs from the chairs numbered 1
to 4 and then men select the chairs from th	e remaining. The number of possible
arrangements is:	
(a) 120	(b) 288
(c) 32	(d) 1440
Answer: d	
Explanation:	
1440	
Step-by-step explanation:	
First women can take any of the chairs marke	d 1 to 4 in 4 different way.
Second women can take any of the remaining	3 chairs from those marked 1 to 4 in 3 different ways.
So, total no of ways in which women can take	seat =4×3
$\Rightarrow 4P2$	
4P2=4!(4-2)!	
=4×3×2×12×1 =12	
After two women are seated 6 chairs remains	
First man take seat in any of the 6 chairs in 6 d	lifferent ways, second man can take seat in any of the
remaining 5 chairs in 5 different ways	
Third man can take seat in any of the remaining	ng 4 chairs in 4 different ways.
So, total no of ways in which men can take sea	t =6×5×4
⇒6P3	
6P3=6!(6-3)!	
⇒6×5×4×3×2×13×2×1	
⇒120	
Hence total number of ways in which men and	l women can be seated =120×12
⇒1440	
Question 2	
	ailable but the actual combination is not known.
	eded to assigns the keys to the corresponding
locks is.	
(a) $(n-1) C_2$	(b) $(n + 1) C_2$
(c) $\sum_{k=2}^{n} (k-1)$	$(\mathbf{d})\sum_{k=2}^{n}K$
Answer: d	(-) - k - 2
Question 3	
The harmonic mean of the roots of the equ	ation
$(5 + \sqrt{2})x^2 - (4 + \sqrt{5})x + 8 + 2\sqrt{5} = 0$, is	
(a) 2	(b) 4
(a) 2 (c) 6	(d) 8
Answer: b	
Explanation:	
-	
let the 2 roots be α , β	

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H.M. =	2αβ	$2 \times \frac{8 + \sqrt{5}}{5 + \sqrt{2}}$	$2 \times 2 (4 + \sqrt{5}) - 4$
11.141. –	$\alpha + \beta$	$\frac{4+\sqrt{5}}{6+\sqrt{2}}$	$(4+\sqrt{5})$ - 4

Question 4

There are ten fights operating between city A and city B. The number of ways in which a person can travel from city A to city B and return by different fight, is

(b) 95

(d) 78

(a) 90 (c) 80

Answer: a

Explanation:

To go from A to B = 10 Flight & to go from B to A = 9 flights (as cannot complaining in some flight) $10 \times 9 = 90$ ways

Question 5

How many odd numbers of four digits can be formed with digits 0, 1, 2, 3, 4, 7 and 8?

(a) 150	(0) 180
(c) 120	(d) 210

NOTE: The correct Ans is: 300

Answer: b

Explanation: $5 \times 5 \times 4 \times 3 = 300$ (0 cannot be here & 1 used in last cannot be here) (1,3,7) can be on last place as it should be odd

Question 6

In how many different ways, can the letters of the word 'DETAIL' be arranged in such a way that the vowels occupy only the odd numbered position?

(a) 32	(b) 36
(c) 48	(d) 60
Answer: b	

Explanation:

Since detail has 6 letters, there are 3 odd positions, the 1st, 3rd, and 5th spots. Let's determine how many ways the word can be arranged when the vowels occupy the odd positions.

1st spot: 3 options (any of the 3 vowels)

2nd spot: 3 options (any of the 3 consonants)

3rd spot: 2 options (any of the 2 remaining vowels)

4th spot: 2 options (any of the 2 remaining consonants)

5th spot: 1 option (the last remaining vowel)

?

6th spot: 1 option (the last remaining consonant)

So, the word can be arranged in $3 \times 3 \times 2 \times 2 \times 1 \times 1 = 36$ ways.

Question 7

${}^{n}C_{p}+2{}^{n}C_{P-1}+{}^{n}C_{P-1}$	p-2
(a) ⁿ⁺ C _P	
(c) ⁿ⁺¹ C _{p+1}	
Answer: d	

(b) $^{n+2}C_p$ (d) $^{n+2}C_{p-1}$

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Explanation:

Direct Formula for refer another origin formula ${}^{n}C_{r} + {}^{n}C_{r-1} = {}^{n+1}C_{r}$

Question 8

A business house wishes to simultaneously elevate two of its six branch heads. In how many ways these elevations can take place?

(a) 12	_	(b) 3
(c) 6		(d) 15

Answer: d Explanation:

 ${}^{6}C_{2} = \frac{6 \times 5}{2} = 15$

JULY 2021

Question 1	
If ⁿ p ₆ = 20 ⁿ p ₄ then the value of n is given by	
(a) n =5	(b) n =3
(c) n = 9	(d) n = 8
Answer: Options (c)	
Explanation:	
By option Method	
Taking n = 9	
${}^{4}p_{6} = 20 {}^{9}p_{4}$	
$6040 = 20 \times 3024$	

60480 = 60480

Question 2

How many number of seven digit numbers which can be formed for the digits 3,4,5,6,7,8,9 no digits being repeated are not divisible by 5?

(a) 4320	(b) 4690
(c) 3900	(d) 3890

Answer: Options (a)

If no should not \div 5 then 5 not on last plag (3,4,5,6,7,8,9) = 6 × 5 × 4 × 3 × 2 × 1 × 6 = 4320

Question 3

A person can go from place 'A' to 'B' by 11 different modes of transport but is allowed to return back to "A" by any mode other than the one earlier. The number of different ways, the entire journey can be complete is______(b) 1010

(a) 110	(b) 10 ¹
(c) 9 ⁵	(d) 10 ⁹

Answer: Options (a)

If a person has 11 ways of going and cannot come from same place 10 ways of coming $11 \times 10 = 110$

Question 4

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The number of ways 5 boys and 5 girls can be	seated at a round table, so no two boys are
adjacent is	
(a) 2550	(b) 2880
(c) 625	(d) 2476
Answer: Options (b)	
Explanation:	
5 boys can sit around the circular table in (5–1)!	
For boys and girls to occupy alternate positions,	
The girls can be arranged in these gaps in 5! ways	
Therefore, total number of seating arrangements	= 4! * 5! = 24 * 120 = 2880
DEC	2021
Ouestion 1	
	ed using the letters of the word DECTIONARY is
(a) 5040	(b) 720
(c) 30240	(d) 90
Answer: a	
Explanation:	
There are 10 letters in the word DECTIONARY. 4	letters can be selected and arranged out of these
10 letters in ${}^{10}C_4 \times 4!$ ways.	
Therefore, $10 \times 0 \times 8 \times 7$	
$10_C \times 4! = \frac{10 \times 9 \times 8 \times 7}{1 \times 2 \times 3 \times 4} \times 4! = 5,040$	
Question 2	
The number of words that can be formed usin	g the letters of the"PETROL" such that the
words do not have "P" in the first position, is	
(a) 720	(b) 120
(c) 600	(d) 540
Answer: c	
Explanation:	
We have 6 places to fill:	
The first place can be filled either with E, T, R, O,	
	econd place can be filled either with P, E, R, O, or L,
i.e., in 5 ways. Suppose you fill the second place with P. Now, the	α third place can be filled either with F. P. O. or I
i.e., in 4 ways.	e till u place can be filled effiler with E, K, O, Of E,
1.c., m 1 ways.	
Suppose you fill the third place with E. Now, the f	ourth. be filled either with R, O, or L, i.e., in 3 ways.
Suppose you fill the fourth place with R. Now, the	e Can fifth be filled either with 0, or L, i.e., in 2 ways.
	ixth place cab be filled either with L, i.e., in 1 way.
Therefore, the number of words that can be form	$ed = 5 \times 5 \times 4 \times 3 \times 2 \times 1 = 600$
Organiza 2	
<u>Question 3</u> If $nP_{0} = 12$, then the value of n is	
If nP ₂ = 12 , then the value of n is (a) 2	(b) 3
(u) #	
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(d) 6

(c) 4

Answer: c Explanation: Try the options. Option (a) -2 ${}^{2}P_{2} = 2$ Option (b) -3 ${}^{3}P_{2} = 3 \times 2 = 6$ Option (c) -3 ${}^{4}P_{2} = 4 \times 3 = 12$

Question 4

The number of different ways the letters of the word "DETAIL" can be arranged in such a way that the vowels can occupy only the odd position is

(a) 32	(b) 36
(c) 48	(d) 60

Answer:

Explanation: Vowels: E, A I Consonants: D, T, L These are six places to be filled:

1 2 3 4 5 6

There are three odd positions, i.e., 1, 3 and 5. Also, there are three vowels. Thereore, three vowels can be arranged in 3 places in 3! Ways.

Similarly, the 3 consonants can be arranged in the positions 2,4, and 6 in 3! Ways. Therefore, total number of ways = $3! \times 3! = 6 \times 6 = 36$.

Question 5

Six boys and five girls are to be seated for a photograph in a row such that no two girls sit together and no two boys sit together. Find the number of ways in which this can be done. (a) 74.200 (b) 96.900

(a) 74,200	(b) 96,900
(c) 45,990	(d) 86,400

Answer:

Explanation: No. of Boys = 6 No. of Girls = 5 $B_1 \times B_2 \times B_3 \times B_4 \times B_5 \times B_6$ No. of ways = 5P_4 = 6! = 5! × 6! = 120×720 =86,400

<u>IUNE 2022</u>

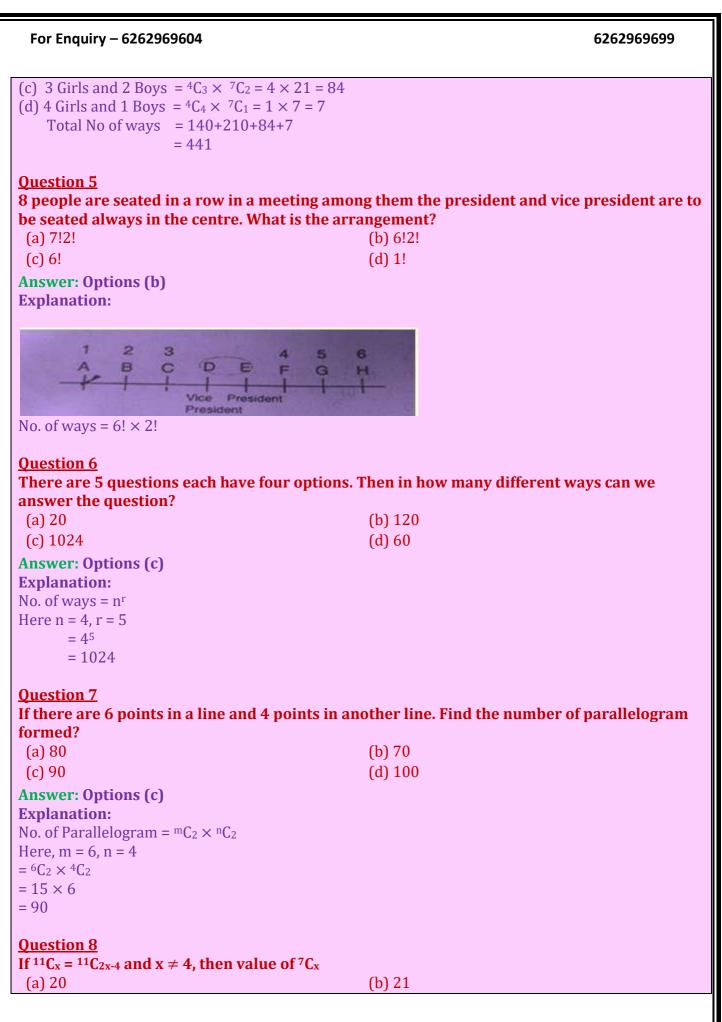
Question 1

If a man travels from place A to B in 10 ways then by hoe many ways can become back by another train?

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For Enquiry – 6262969604	6262969699
(a) 94	(b) 110
(c) 90	(d) 99
Answer: Options (c)	
Explanation:	
No. of ways = 10×9	
= 90	
Question 2	
If four words are taken with or without mean	ing from the word 'Logarithm' without
repetition. How many words will be formed?	
(a) 5040	(b) 2520
(c) 120	(d) 40320
Answer: Options (a)	
Explanation: 'Logarithm'	
Here $n = 10$ and $r = 4$	
No. of ways = n pr	
$= {}^{10}p_4$	
$=\frac{\underline{L10}}{\underline{L10-4}}=\frac{\underline{L10}}{\underline{L6}}$	
$-\frac{10\times9\times8\times7L6}{10\times9\times8\times7L6}$	
$= \frac{1}{5040}$	
0010	
Question 3	
If $\frac{n!}{10} = \frac{(n-1)!}{(n-1-n+3)!}$, find 'n'.	
(a) 4	(b) 5
(c) 6	(d) 7
Answer: Options (b)	
Explanation:	
If $\frac{n!}{10} = \frac{(n-1)!}{(n-1-n+3)!}$	
$\frac{n(n-1)!}{10} = \frac{(n-1)!}{2!}$	
$n = 1 \longrightarrow 2n = 10$	
$\frac{n}{10} = \frac{1}{2} \Rightarrow 2n = 10$ n = 5	
n = 5	
Question 4	
7 boys and 4 girls from which a team of 5 is to	b be selected, each team should have atleast one
girl is:	
(a) 429 (c) 419	(b) 439 (d) 441
(c) 419	(d) 441
Answer: Options (d) Explanation:	
Boys Girls	
7 4	
If at least one girl is selected then it may be follow	
(a) 1 Girls and 4 Boys = ${}^{4}C_{1} \times {}^{7}C_{4} = 4 \times 35 = 140$	
(b) 2 Girls and 3 Boys = ${}^{4}C_{2} \times {}^{7}C_{3} = 6 \times 35 = 210$	
	5. 29

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(c) 22

(d) 23

Answer: Options (b) Explanation: If ${}^{11}C_x = {}^{11}C_{2x-4}$ [:. if ${}^{n}C_x = {}^{n}C_y$, then n = n + ythen, x + 2n - 4 = 11 3n = 15 $n = \frac{15}{3} = 5$ ${}^{7}C_n = {}^{7}C_5 = {}^{7}C_2 = \frac{7 \times 6}{2 \times 1} = 21$

DEC 2022

Question 1

There are 20 points in a plane area. How many triangles can be formed by these points if 5points are collinear?a) 550b) 560c) 1130d) 1140

Answer: Options (d)

Explanation:

To get a triangle, three points must be connected. Hence, we have to select 3 points from 20 points. Therefore, $20! = 20 \times 19 \times 18$

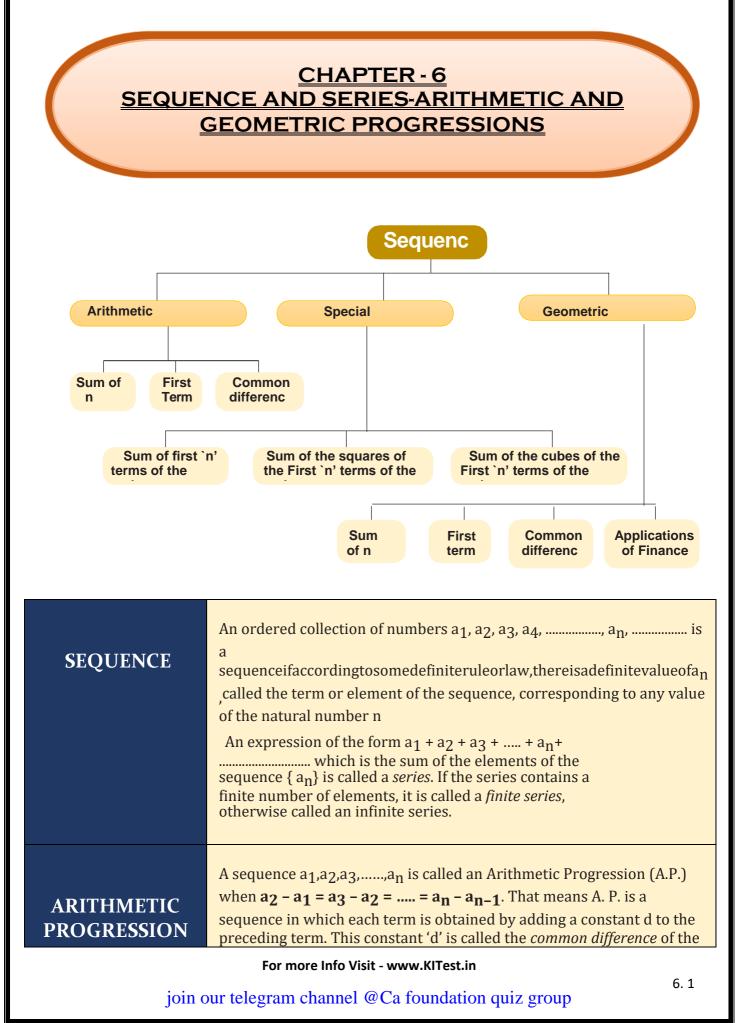
 ${}^{20}C_3 = \frac{20!}{17! \times 3!} = \frac{20 \times 19 \times 18}{3 \times 2} = 1140$

Question 2

The number of ways 4 boys and 3 girls can be seated in a row so that they are alternate is: a) 12 b) 288 c) 144 Answer: Options (c) Explanation: B <u>G</u> B <u>G</u> B <u>G</u> B 4 boys take their seats in 4! ways 3 girls take their seats in 3! ways Required number = 4! x 3! = 24 x 6 = 144 Ouestion 3

If $n_{P_r} = 3024$ and $n_{C_r} = 126$, then find n and r a) 9,4 b) 10,3 c) 12,4 Answer: Options (a) Explanation: $n_{P_r} = 3024 = 72 \times 42 = 9 \times 8 \times 7 \times 6 = \frac{9!}{(9-4)!} = 9_{P_4}$ Hence (n, r)=(9,4)

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For Enquiry – 626296960)4	6262969699
	A.P. If 3 numbers a, b, c a called the arithmetic mea nthterm (t_n) = a + (n – Where a = First Term D = Common differences Sum of 1st n natural or c	1) = t _n - t _{n-1}
	Sum of n terms of AP	$s = \frac{n}{2}[2a + (n-1)d]$
	Sum of the first n terms	Sum of 1st n natural or counting numbers S = n(n + 1)/2
	Sum of 1st n odd number	$S = n^2$
	Sum of the Squares of the first, n natural numbers	n(<u>n + 1) (2n + 1)</u>
GEOMETRIC PROGRESSION (G.P)	proceeding term, then the (G.P). The constant multip $\frac{\text{Anyterm}}{P \text{receding term}} = \frac{t_n}{t_{n-1}}$ $= \frac{ar^{n-1}/ar^{n-2}}{s} = r$ Sum of first n terms of a GP	The sequence is called a Geometric Progression blier is called the common ratio. $h = a (1 - r^{n}) / (1 - r) \text{ when } r < 1$ $h = a (r^{n} - 1) / (r - 1) \text{ when } r > 1$ $h = a / (1 - r) \text{ where } 0 < r < 1$
GEOMETRIC MEAN	A.M. of a &b is=(a+b)/2 If a, b, c are in G.P we get $b/a = c/b \Rightarrow b^2 = ac$, b is called the geometric mean between a and c	
Questions ? Answe ?	S	
-	<u>Question: 1</u> Find the 7 th term of the A.P. 8, 5, 2, -1, -4, For more Info Visit - www.KITest.in	
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(a) 10	(b) -10
(c) 8	(d) -8
Answer: b	
Explanation:	
Here a = 8, d = 5 – 8 = -3	
Now $t_7 = 8 + (7-1) d$	
= 8 + (7 - 1) (-3)	
= 8 + 6 (-3)	
= 8 - 18	
= -10	
Question: 2	
If 5 th and 12 th terms of an A.P. are 14	and 35 respectively, find the A.P.
(a) 2, 5, 8, 11, 14,	(b) 2, 3, 8, 11, 12,
(c) 2, 3, 4, 11, 14	(d) 2, 5, 8, 1, 4,

Answer: a

Explanation: Let a be the first term & d be the common difference of A.P. $t_5 = a + 4d = 14$ $t_{12} = a + 11d = 35$ On solving the above two equations 7d = 21 = i.e. d = 3And $a = 14 - (4 \times 3) = 14 - 12 = 2$ Hence, the required A.P. is 2, 5, 8, 11, 14,.....

Question: 3

Divide 69 into three parts are in A.P. and are such that the product of the first two parts is 483.

(a) 21, 23, 25.	(b) 21, 22, 23,
(c) 22, 23, 25.	(d) 21, 22, 25.
Answer: a	
Explanation:	
Given that three parts are in A.P., let the three	parts which are in A.P. be a – d, a, a + d
Thus a – d + a + a + d = 69	
Or 3a = 69	
Or a = 23	
So the three parts are 23 – d, 23, 23 + d	
Since the product of first two parts is 483, the	refore, we have $23(23 - d) = 483$

 $\text{Or } 23 - d = \frac{483}{23} = 21$

Or d = 23 - 21 = 2

Hence, the three parts which are in A.P. are 23 - 2 = 21, 23, 23 + 2 = 25Hence the three parts are 21, 23, and 25

Question: 4 Find the arithmetic mean between 4 and 10. (a) 5 (b) 7 (c) 10 (d) 3 Answer: b

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Explanation: We know that the A.M. of a & b is = (a+b) / 2Hence, The A.M. between 4 & 10 = (4 + 10) / 2 = 7

Question: 5

Find the G.P. series where 4^{th} term is 8 and 8^{th} term is 128/625

(a) 125, 50,20,9, (b) 125,50,20,10, (c) 125, 5,20,8... Answer: d Explanation: $t4 = ar^3 = 8$ $T8 = 128/625 \rightarrow ar^7 = 128/625$

T8/T4 =
$$128/625 \times 1/8$$

 \Rightarrow ar⁷/ar³ = $16/625$
 \Rightarrow r⁴ = $2^4/5^4$
 \Rightarrow r = $2/5$

 $ar^3 = 8$

→ $a (2/5)^3 = 8$ → $a \times 8/125 = 8$ → a = 125

Therefore, a = 125, ar = $125 \times 2/5 = 50$, ar² = $125 \times 4/125 = 20$ Or 125, 50, 20, 8... Forms a G.P.

Question: 6

Insert three geometric means between $\frac{1}{9}$ and 9 (a) $\frac{1}{9}, \frac{1}{3}, 1, 3, 9$ (c) $\frac{11}{9}, \frac{1}{3}, 1, 3, 9$ (b) $\frac{1}{8}, \frac{1}{5}, 1, 3, 9$ (d) $\frac{121}{9}, \frac{1}{3}, 1, 3$ Answer: a **Explanation**: G.P. Series¹/₉, --,--, 9 Here t1 = a = $\frac{1}{2}$ $t5 = a.r^4 = 9$ Now, $t5 = \frac{1}{2} \cdot r^4 = 9$ $= r^4 = 81$ $= r^4 = 3^4$ = r = 3 $t2 = ar = \frac{1}{9} \times 3 = \frac{1}{3}$ $t3 = ar^2 = \frac{1}{9} \times 3^2 = 1$ $t4 = ar3 = \frac{1}{9} \times 3^3 = 3$ Thus the series $\frac{1}{9'3}$, 1, 3, 9

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Question: 7

Find the sum of 1st term of G.P. series 1+2+4+8+..... (a) 155 (b) 255 (c) 185 (d) -822 Answer: b Explanation: Here a = 1, r = 2, n = 8 $S_n = a.\frac{(r^n-1)}{(r-1)}$ When r > 1 $S_8 = 1.\frac{(2^3-1)}{(2-1)}$ = 1 (256 - 1) = 255 Thus $S_8 = 255$

Question: 8

Find the sum of the series -2, 6, -187 terms? (a) 1554 (b) -1094 (c) 1094 (d) -8223 Answer: b Explanation: Here a = -2, r = -3, n = 7 $S_n = a.\frac{(1-r^n)}{(1-r)}$ When <1 $S_7 = (-2)\frac{[1-(-3)^7]}{[1-(-3)]}$ $= (-2)\frac{(1+2187)}{4}$ $= (-2)\frac{(2188)}{4}$ $S_7 = -1094$

Question: 9

In a G.P. the product of the 1st three terms 27/8. The middle term is (a) $\frac{27}{8}$ (b) $\frac{3}{2}$ (c) $\frac{2}{9}$ (d) $\frac{8}{27}$ Answer: b Explanation:

Let the three terms Of GP are $\frac{a}{r}$, a, ar

Now product of terms

 $\frac{a}{r} \times a \times ar = \frac{27}{8}$ $a^{3} = \frac{27}{8}$ $a^{3} = (\frac{3}{2})^{3}$ $a = \frac{3}{2}$ Thus the middle term, $a = \frac{3}{2}$

Question: 10

If you save 1 paisa today, 2 paisa the next day and 4 paisa the succeeding day and so on, then your total savings in two weeks will be.

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(a) Rs. 168.32	(b) Rs. 163.98
(c) Rs. 163.83	(d) None
Answer: c	
Explanation:	
Here the pattern of savings the G.P series 0.01	, 0.02, 0.04
Here a = 0.01, r = 2, n = 14	
$S_n = a \cdot \frac{(r^n - 1)}{(r - 1)}$ When $r > 1$	
$S_{14} = 0.01 \frac{(2^{14} - 1)}{(2 - 1)}$	
$= 0.01 \frac{(16384-1)}{1}$	
= 0.01×16383	
S ₁₄ = 163.83	
Thus the total savings in 14 days would be Rs.	163.83.
Question: 11	
The sum of the infinite G.P series $1 - \frac{1}{3} + \frac{1}{9} - \frac{1}{27}$.	
(a) 0.75	(b) 75
(c) 0.57	(d) 57
Anguaria	

Answer: a

Explanation: Here a = 1, r = $\left(\frac{-1}{3}\right)$ $S_{\infty} = \frac{a}{(1-r)} = \frac{1}{\left[1 - \left(\frac{-1}{3}\right)\right]}$ = = 1/ [4/3] = $\frac{3}{4}$ = 0.75

Question: 12

 Find the 10th term of the A.P.: 2, 4, 6,

 (a) 20
 (b) 40

 (c) 2
 (d) 0.20

 Answer: a

 Explanation:

 Here the first term (a) = 2 and common different d = 4 - 2 = 2

 Using the formula $t_n = a + (n - 1) d$, we have

 $t_{10} = 2 + (10 - 1) 2 = 2 + 18 = 20$

 Hence, the 10th term of the given A.P. is 20

Question: 13

The 10th term of an A.P. is -15 and 31st term is -57, find the 15th term

(a) -20	(b) 20
(c) -25	(d) 25
Answer: c	

Explanation:

Let a be the first term and d be the common d be the common difference of the A.P. Then from the formula:

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 $t_n = a + (n - 1) d$, we have $t_{10} = a + (10 - 1) d = a + 9d$ $t_{31} = a + (31 - 1) d = a + 30 d$ We have, $a + 9d = -15 \dots (1)$ $a + 30d = -57 \dots (2)$ Solve equations (1) and (2) to get the values of a and d. Subtracting (1) from (2), we have 21d = -57 + 15 = -42 $-42 \div 21 = 2$ Again from (1), a = -15 - 9d = -15 - 9(-2) = -15 + 18 = 3Now $t_{15} = a + (15 - 1) d$ = 3 + 14 (-2) = -25

Question: 14

 Which term of the A.P.: 5, 11, 17 ... is 119?

 (a) n = 20 (b) n = 2

 (c) n = 30 (d) n = 19

 Answer: a
 Explanation:

 Here a = 5, d = 11-5 = 6 tn = 119 we know that

 tn = a + (n - 1) d
 ? 119 = 5 + (n - 1) x 6

 $(n - 1) = \frac{119-5}{6} = 19$ n = 20, therefore, 119 is the 20th term of the given A.P.

Question: 15

Is 600 a term of the A. P.: 2, 9, 16,? (a) yes (b) no (c) not sure (d) none Answer: b Explanation: Here, a = 2, and d = 9 - 2 = 7. Let 600 be the nth term of the A.P. We have $t_n = 2 + (n - 1) 7$ According to the question 2 + (n - 1) 7 = 600 (n - 1) 7 = 598Or $n = \frac{598}{7} + 1$ $n = 86\frac{3}{7}$ Since n is a fraction, it cannot be a term of the given A.P. Hence, 600 is performed.

Since n is a fraction, it cannot be a term of the given A.P. Hence, 600 is not a term of the given A.P.

Question: 16

The common difference of an A.P. is 3 and the 15th term is 37. Find the first term. (a) -5 (b) 5 (c) 42 (d) -42 Answer: a Explanation: Here d = 3, t₁₅ = 37, and n = 15 Let the first term be a. we have

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t_n = a + (n-1) d 37 = a + (15 - 1) 3 Or, 37 = a + 42 a = -5Thus, first term of the given A.P. is -5

Question: 17

Geometric mean G between two numbers a and b id(a) ab(b) ab^2 (c) a^2b (d) \sqrt{ab} Answer: d

Explanation:

If a single geometric mean 'G' is inserted between two given numbers 'a' and 'b', then G is known as the geometric mean between 'a' and 'b'.

G.M. = G = G² = \sqrt{ab}

Question: 18

If A and G are arithmetic and geometric mean respectively between two positive numbers a and b, then A (AM) < G (GM) is correct?

(a) yes (b) no (c) not sure (d) none Answer: b **Explanation:** We have A.M. = A = $\frac{a+b}{2}$ and G.M. = G = G² = \sqrt{ab} $A - G = \frac{a+b}{2} - \sqrt{ab}$ $=\frac{a+b-2\sqrt{ab}}{\sqrt{ab}}$ $=(\sqrt{a}-\sqrt{b})^2$ Root will be open automatically A - G > 0 \rightarrow A > G **Ouestion: 19** Find the sum of the AP: 11, 17, 23, and 29... of first 10 terms. (a) 380 (b) 568 (c) 960 (d) 593 Answer: a **Explanation**: = > nth term for the given AP = 5 + 6 n => First term = 5+ 6 = 11 => Tenth term = 5 + 60 = 65

=> Sum of 10 terms of the AP = 0.5n (first term + last term) = 0.5 x 10 (11 + 65)

=> Sum of 10 terms of the AP = 5 x 76 = 380

Question: 20

Find the G. M. between $\frac{3}{2}$ and $\frac{27}{2}$

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(a) $\frac{9}{2}$ (c) $\frac{6}{3}$ Answer: a Explanation: We know that if a is the G. M. between a and b G = \sqrt{ab} G. M. between $\frac{3}{2}$ and $\frac{27}{2} = \sqrt{\frac{3}{2} \times \frac{27}{2}}$ $= \frac{9}{2}$	(b) $\frac{2}{9}$ (d) $\frac{3}{6}$, then
Question: 21 Insert three geometric means between 1 at (a) 4, 16, 64, (c) Both Answer: c Explanation: Let G ₁ , G ₂ , G ₃ , be 3 GMS both 1, & 256 Then, 1, G ₁ , G ₂ , G ₃ , 256 will be in GP Let common ratio be r \therefore G ₁ = r So r ⁴ = 256 r = \pm 4 G ₁ = \pm 4 G ₂ = \pm 16 G ₃ = \pm 64	nd 256. (b) -4, 16, -64 (d) None
Question: 22 If 4, 36, 324 are in G.P. insert two more num	nbers in this progression so that it again
forms a G.P. (a) 12, 108 (c) 16, 120 Answer: a Explanation: G. M. between 4 and $36 = \sqrt{4 \times 36} = \sqrt{144} = 1$ G.M. between 36 and $324 = \sqrt{36 \times 324} = 6 \times 1$ If we introduce 12 between 4 and 36 and 108 4, 12, 36, 108, 324 form a G.P. The two new numbers inserted are 12 and 10	8 = 108 between 36 and 324, the numbers
9, How much distance will it travel befor (a) 64 cm (c) 1 am Answer: a	(b) 46 cm (d) none
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Explanation:

The distance travelled by the pendulum in consecutive seconds are, 16, 12, 9 ... is an infinite geometric progression with the first term a = 16 and r = $\frac{12}{16} = \frac{3}{4} < 1$ Hence, using the formula S = $\frac{a}{1-r}$ we have S = $\frac{16}{1-\frac{3}{4}} = \frac{16}{\frac{1}{4}} = 64$

Distance travelled by the pendulum is 64 cm.

Question: 24 Which term of the G.P.: 5, -10, 20, -40,... is 320? (a) 7 (b) 6 (d) 12 (c) 3 Answer: a **Explanation**: In this case, a = 5; $r = \frac{-10}{5} = -2$ Suppose that 320 is the nth term of the G. P. By the formulate = ar^{n-1} , we get $t = 5. (-2)^{n-1}$, we get $320 = 5.(-2)^{n-1} = 64 = (2)^6 = (-2)^{n-1}$ n - 1 = 6n = 7Hence 320 is the 7th term of the G.P.

Question: 25

If a, b, c is in G.P., then (a) $a(b^2 + a^2) = c (b^2 + c^2)$ (b) $a(b^2 + a^2) = c(a^2 + b^2)$ (c) $b(b^2 + a^2) = c(b^2 + c^2)$ (d) None Answer: b Explanation: If a, b, c is in to G.P. Then $b^2 = ac$ $b^2(a - c) = ac (a-c)$ $b^2a - ac^2 = a^2c - b^2c$ $a (b^2 + c^2) = c (a^2 + b^2)$ Trick: Put a=1, b=2, c=4, and check the alternates.

Question: 26

The sum of infinity of the progression 9-3+1- $\frac{1}{3}$ + ... is (a) 9 (b) 9/2 (c) 27/4 (d) 15/2 Answer: c Explanation: Infinite series 9-3+1- $\frac{1}{3}$ \propto is a G. P. with $a = 9, r = \frac{-1}{3} \setminus S_{\alpha} = \frac{a}{1-r} = \frac{9}{1+\frac{1}{3}} = \frac{9\times3}{4} = \frac{27}{4}$

<u>Question: 27</u> The product (32) (32)^{1/6}(32)^{1/36}To∞ is.

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6. 11

(a) 16 (c) 64 Answer: c Explanation: (32) (32)1/6(32) 1/36 $\infty = (32)^{1+\frac{1}{6}+\frac{1}{36}+\cdots}$	(b) 32 (d) 0 $^{\infty} = (32)^{\left(1-\frac{1}{6}\right)}$
$(32)^{\frac{1}{5/6}} = (35)^{6/5} = 2^6 = 64$	
$\begin{array}{l} \begin{array}{l} \begin{array}{l} \begin{array}{l} \begin{array}{l} \begin{array}{l} \begin{array}{l} \begin{array}{l} $	(b) 5050 (d) 50000 5, are 5, 10, 15 1000 2 integers 5, 15, 25 995
Thus the sum of the series = $(100/2)(5 + 995)$	5) = (50) (1000) = 50000.
Question: 29 If s is the sum of an infinite G.P., the first term (a) $\frac{a-s}{s}$ (c) $\frac{a}{1-s}$ Answer: b Explanation: $S = \frac{a}{1-r}$ s-sr = a -sr = a-s $r = \frac{s-a}{s}$	erm a then the common ratio r given by (b) $\frac{s-a}{s}$ (d) none
Question: 30 If in an infinite C.P. first term is equal to th	e twice of the sum of the remaining terms,
then its common ratio is (a) 1 (c) 1/3 Answer: c Explanation: Given, $a=2\left(\frac{ar}{1-r}\right)$ 1-r = 2r $r = \frac{1}{3}$	(b) 2 (d) -1/3
Question: 31	
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If n geometric means between a and b be $G_1, G_2, \dots G_n$ and a geometric mean be G, then the true relation is

(b) $G_1, G_2, \dots, G_n = G^{1/n}$ (a) $G_1, G_2, \dots, G_n = G$ (c) $G_1, G_2, \dots, G_n = G^n$ (d) none **Answer: c Explanation**: Here $G = (a b)^{1/2}$ and $G_1 = ar^1, G_2 = ar^2, \dots G_n = ar^n$. therefore $G_1, G_2, G_3, \dots, G_n = a^n r^{1+2+\dots+n} = a^n r^{n(n+1)/2}$ But $ar^{n+1} = b$ $r = \left(\frac{b}{a}\right)^{\frac{1}{n+1}}$ Therefore, the required product is $a^n \left(\frac{b}{a}\right)^{\frac{1}{(n+1)}.n(n+1)/2}$ $= (ab)^{n/2}$ $= \{(ab)^{1/2}\}^n$ $= G^n$ Note: It is a well-known fact. **Ouestion: 32** 7th term of the sequence $\sqrt{2}$, $\sqrt{10}$, $5\sqrt{2}$... is (a) $125\sqrt{10}$ (b) $25\sqrt{2}$ (c) 125 (d) $125\sqrt{2}$ **Answer: D Explanation**: **Given sequence** is $\sqrt{2}$, $\sqrt{10}$, $5\sqrt{2}$**Common ratio** $r=\sqrt{5}$, first term a $=\sqrt{2}$, then 7th term $t_7 = \sqrt{2} (\sqrt{5})^{7-1} = \sqrt{2} (\sqrt{5})^6 = \sqrt{2} (5)^3$

 $125\sqrt{2}$

Question: 33

If the first term of a G.P. be 5 and common ratio be -5, then which term is 3125? (a) 6^{th} (b) 5^{th} (c) 7^{th} (d) 8^{th} Answer: b Explanation: Given that first term a=5 and common ratio r=-5. Suppose that nth term is 3125 Then $ar^{n-1} = 3125$ $5(-5)^{n-1} = \frac{5^5}{5} 5^4$ $n-1 = 4 = (n \rightarrow 5)$

Question: 34The sums of n terms of three A.P.'s whose first term is 1 and common differences are 1,2, 3 are S_1, S_2, S_3 respectively. The true relation is(a) $S_1 + S_2 = S_3$ (b) $S_1 + S_3 = 2S_2$ (c) $S_1 + S_2 = 2S_3$ (d) noneAnswer: b

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Explanation: We have $a_1 = a_2 = a_3 = 1$ $d_1 = 1, d_2 = 2, d_3 = 3$ Therefore, $S_1 = \frac{n}{2}(n + 1)...(i)$ $S_2 = \frac{n}{2}(2n+1)...(ii)$ $S_3 = \frac{n}{2}(3n+1)$... (iii) Adding (i) and (iii), $S_1 + S_3 = \frac{n}{2}[(n+1) + (3n+1)] \rightarrow \frac{n}{2}[4n+2]$ $=2\left[\frac{n}{2}(2n+1)\right]=2S_{2}$ Hence correct relation $S_1 + S_3 = 2S_2$ **Question: 35** What is the sum of all 3 digit numbers that leave a remainder of '2' when divided by 3? (b) 164,850 (a) 897 (d) 149,700 (c) 164,749 **Answer: b Explanation**: The smallest 3 digit number that will leave a remainder of 2 when divided by 3 is 101. The next number that will leave a remainder of 2 when divided by 3 is 104, 107, The largest 3 digit number that will leave a remainder of 2 when divided by 3 is 998. So, it is an AP with the first term being 101 and the last term being 998 and common difference being 3. Sum of an AP = $\frac{First \ term + Last \ term}{2}$ × Number of term We know that in an A.P., the nth term $a_n = a_1 + (n - 1)^* d$ In this case, therefore, $998 = 101 + (n - 1)^{*3}$ i.e. $897 = (n - 1)^*3$ Therefore n - 1 = 299Or n = 300Sum of the AP will therefore be $\frac{101+998}{2} \times 300 = 164,850$ **Question: 36** What is the sum of the following series? -64, -66, -68,...., -100 (a) -1458 (b) -1558 (d) -1664 (c) -1568 Answer: b **Explanation:** The sequence is -64, -66, -68,....-100. The given set of numbers are in an arithmetic progression Key data: First term is -64. The common difference is -2. The last term is -100 Sum of the first n term is an AP = $\frac{n}{2}[2a_1 + (n-1)d]$ To compute the sum, we know the first term $a_1 = -64$ and the common difference d = -2We do not know the number of terms n. Let us first compute the number of terms and then find the sum of the terms. Step to compute number of terms of the sequence $a_n = a_1 + (n - 1) d$

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-100 = -64 + (n - 1)(-2)Therefore, n = 19. Sum S_n = $\frac{19}{2}$ [2(-64) + (919-1) (-2)] S_n = $\frac{19}{2}$ [-128-36] S_n = 19 x (-82) = -1558

Question: 37

The sum of third and ninth term of an A.P. is 8. Find the sum of the first 11 terms of the progression.

(a) 44 (b) 22 (c) 19 (d) None of these **Answer: a Explanation:** The third term $t_3 = a + 2d$ The ninth term $t_9 = a + 8d$ $t_3 + t_9 = 2a + 10d = 8$ Sum of first 11 terms of an AP is given by $S_{11} = \frac{11}{2}[2a + 10d]$ $S_{11} = \frac{11}{2}[8] = 44$

Question: 38

The sum of the three numbers in A.P is 21 and the product of the first and third number of the sequence is 45. What are the three numbers?

(a) 9, 7 and 5 (b) 3, 7, and 11 (c) Both A & B (d) None of these Answer: a **Explanation**: Let the number are be a - d, a, a + dThen a - d + a + a + d = 213a = 21a=7 and (a - d) (a + d) = 45 $a^2 - d^2 = 45$ $d^2 = 4$ $d = \pm 2$ Hence, the number are 5, 7 and 9 when d = 2 and 9, 7 and 5 when d = -2. In both the cases numbers are the same.

Question: 39

If the first term of G.P. is 7, Its nth term is 448 and sum of first n terms is 889, then find the fifth term of G. P.

(a) 112 (b) 110 (c) 62 (d) 39 Answer: a Explanation: Given a = 7 the first term $t_n = ar^{n-1} = 7(r)^{n-1} = 448$. $7r^n = 448 r ---- (1)$

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Also $S_n = \frac{a(r^{n}-1)}{r-1} = \frac{7(r^{n}-1)}{r-1}$ $889 = \frac{448r-7}{r-1}$ {value of rⁿ from (1)} R = 2 Hence $T_s = ar^4 = 7(2)^4 = 112$

Question: 40

If the third and fourth terms of arithmetic sequence are increased by 3 and 8 respectively. Then the first four terms form a geometric sequence. Find (i) the sum of the first four terms of A.P.

(a) 54 (b) 27 (c) 23 (d) 79 Answer: a **Explanation**: Sol. a,(a + d), (a + 2d), (a + 3d) in A.P. a, a + d, (a + 2d + 3), (a + 3d + 8) are in G.P. Hence a + d = aralso $r = \frac{a+d}{a} = \frac{a+2d+3}{a+d} = \frac{a+3d+8}{a+2d+3}$ $\frac{d+3}{d} = \frac{d+5}{d}$ d d+3 → $d^2 + 6d + 9 = d^2 + 5d$ → d = -9 $\frac{a-9}{=} = \frac{a-15}{2}$ a-9 → $a^2 - 18a + 81 = a^2 - 15a$ → $3a = 8_1$ → a = 27Hence A.P. is 27, 18, 9, 0, Sum of the first four terms of AP = 54

Question: 41

Three positive numbers form a G.P. If the second term is increased by 8, the resulting sequence is an A.P. In turn, if we increase the last term of this A.P. by 64, we get a G.P. Find the three numbers.

(a) 4, 12, 36 (c) 5, 15, 20 **Answer: a** (b) 4, 8, 16 (d) none

Question: 42

The sum of the first five terms of a geometric series is 18₉. The sum of the first six terms is 3⁸¹, and the sum of the first seven terms is 7⁶5. What is the common ratio in the series?

(a) 3 (b) 2 (c) 6 (d) 56 Answer: b Explanation: Let the numbers be a, a r, a r² when r > 0 Hence a, (a r + 8), a r² in A.P. - (1) Also a, (a r + 8), a r² + 64 in G.P. - (2) \rightarrow (a r + 8)² = a (a r² + 64) a = 4/4-r - (3) Also (1) \rightarrow 2(ar + 8) = (a + ar²) \rightarrow (1 - r)² = 16/a - (4) From (3) and (4) r = 3 or -5 (rejected) Hence a = 4 numbers are: 4, 12, 3⁶

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Explanation: $S_5 = 18_9$; $S_6 = 3^{81}$; $S_7 = 7^65$; $t_6 = S_6 - S_5 = 3^{81} - 18_9 = 19^2$ $t_7 = S_7 - S_6 = 7^65 - 3^{81} = 3^{84}$ Now common ratio $= \frac{t_7}{t_6} = \frac{3^{84}}{19^2} = 2$

Question: 43

Find the 3rd nth term for the AP: 11, 17, 23, 29,.... (a) 23 (b) 17 (d) 6 (c) 11 Answer: a **Explanation**: Here, a = 11, d = 17-11 = 23 – 17 = 29 – 23 = 6 We know that nth term of an AP is a + (n - 1) d=>nth term for the given AP = 11 + (n - 1)6=>nth term for the given AP = 11 + (n - 1) 6=>nth term for the given AP = 5 + 6n We can verify the answer by putting values of 'n' => n = a -> First term = 5 + 6 = 11 => n = 2 -> Second term = 5 +12 = 17 => n = 3 -> Third term = 5 + 18 = 23

Question: 44

The sum of three numbers in a GP is 26 and their product is 216. And the numbers. (a) 2, 6 and 18 (b) 3, 7, and 11 (d) None of these (c) Both Answer: a **Explanation:** Let the numbers be $\frac{a}{r}$, a, ar. $=>(\frac{a}{r}) + a + ar = 26$ $\Rightarrow a \frac{(1+r+r^2)}{r} = 26$ Also, it is given that product = 216 $=>(\frac{a}{r}) x (a) x (a r) = 216$ $=> a^3 = 216$ => a = 6 $=> 6 \frac{(1+r+r^2)}{r} = 26$ $=> \frac{(1+r+r^2)}{r} = \frac{26}{6} = \frac{13}{3}$ $=> 3 + 3r + 3r^2 = 13 r$ $=> 3 r^2 - 10r + 3 = 0$ $=> (r-3) (r - (\frac{1}{3})) = 0$ $=> r = 3 \text{ or } r = \frac{1}{2}$ Thus, the required numbers are 2, 6 and 18.

Question: 45

A Sequence in which the ratio of two consecutive terms is always constant (1, 0) is called (a) AP (b) GP

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(d) NP

(c) HP Answer: b

Explanation:

A Sequence in which the ratio of two consecutive terms is always constant (1, 0) is called a Geometric progression (G.P.)

Question:46

For the elements 4 and 6, verify (a) $A \ge G \ge H$ (b) $A < G \ge H$ (c) $A > G \ge H$ (d)None Answer: a Explanation: A = Arithmetic Mean = (4 + 6) / 2 = 5 $G = Geometric Mean = \sqrt{4 \times 6} = 4.8989$ H = Harmonic Mean = (2 x 4 x 6) / (4 + 6) = 48 / 10 = 4.8Therefore, $A \ge G \ge H$

Question: 47

A sequence of numbers is called?

(a) Geometric Progression

(c) Harmonic Progression **Answer: d**

Explanation:

Harmonic Progression (HP)

A sequence of numbers is called a harmonic progression if the reciprocal of the terms are in AP. In simple terms, a, b, c, d, e, f are in HP if 1/a, 1/b, 1/c, 1/d, 1/e, 1/f are in AP.

(d) All

(b) Arithmetic progression (AP)

Arithmetic Progression (AP)

A sequence of numbers is called an arithmetic progression if the difference between any two consecutive terms is always same.

Geometric Progression (GP)

A sequence of numbers is called a geometric progression if the ratio of any two consecutive terms is always same.

Question: 48

An AP has 13 terms whose sum is 143. The third term is 5, then first term is: (a) 4 (b) 7 (c) 9 (d) None of these Answer: d **Explanation**: S (13) = 143 S(13) = (n/2)(2a+(n-1)d) $= (13/2) \times (2a-12d)$ $= 13 \times (a+6d)$ = 13a + 78d = 143 ----- (1) Divide both sides by 13 a+6d=11 (1) T(3) = a+2d=5 (2) Subtract (2) from (1) 4d=6

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d=3/2 Substituted in any of the equations(am using 2) a + 2(3/2) = 5a+ 3=5 a=2

Question: 49

The series $1^3 + 2^3 + 3^3 + \dots 20^3$ is equal to a) 4410 b) 4410000 c) 44100 d) None of these Answer: c **Explanation** $(n(n+1)/2)^2$ $(20(20+1)/2)^2$ 44100.

PREPARE FOR WORST

Question 1

What is the sum of all 3 digit numbers that leave a remainder of `2' when divided by 3?		
(a) 897	(b) 164,850	
(c) 164,749	(d) 149,700	

Ouestion 2

A piece of equipment cost a certain factory Rs. 6, 00,000. If it depreciates in value, 15% the first year, 13.5% the next year . 12% the third year , and so on , what will be its value at the end of 10 years, all percentages applying to the original cost

> (b) 1,05,000 (d) 6,50,000

(a	a)	2,	0	0,	0	00	0
1	2		~		~	~	2

(c) 4,05,000

Ouestion 3

If a rubber ball consistently bounces back 2/3 of the height from which it is dropped, what

Fraction of its original height wills the ball bounce after being dropped and bounced four times without being stopped?

(a) 16/81	(b) 16/27
(c) 4/9	(d) 37/81

Ouestion 4

Find the sum of first 30 positive integer multiple of 6

Question 5

How many numbers are there between 200 and 800 which are divisible by both? 5 and 7?

Ouestion 6

If (p + q)th term of an A.P is m and (p-q)tn term is n, then pth (a) mn

(b) \sqrt{mn}

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(c) $\frac{1}{2}(m-n)$	(d) $\frac{1}{2}(m+n)$
Question 7	
If 7 times the 7th term of an A.P is equal to 1	
(a) 18 (c) 77	(b) 9 (d) 0
	(u) 0
Question 8	
There is a set of four numbers p,q,r and s res are in G.P. and the last three are in A.P with	
numbers are the same find the value of P.	a unierence of 0. If the first and the four th
(a) 8	(b) 2
(c) -4	(d) -24
<u>Ouestion 9</u>	
An arithematic progression has 23 terms, th	
arithematic progression is 270, and the sum progress is 1320. What is the 18 th term of th	
(a) 240	(b) 360
(c) 340	(d) 440
Question 10	
Find the value of `a' given that the geometric	c mean between x and y is
(a) -2/3	(b) -1/4
(c) -3/2	(d) -7/6
Question 11	
Sum of three numbers in GP with common r	
numbers are multiplied by 4 and the 3 rd num Terms are in AP. What is the highest of the t	
(a) 60	(b) 50
(c) 30	(d) 45
Question 12	
There are three terms x.y.z between 4&40 st	uch that (i) their sum is 37 (ii) 4,x,y are
consecutive terms of an A,P and (iii) y,z,40 a	re the consecutive terms of a G.P, Find the
value of Z	(h) 10
(a) 20 (c) 12	(b) 10 (d) 15
Question 13 A tortaise welly: 500 m in one day, the part of	day it walks 250 m the payt day 125 m and
A tortoise walks 500 m in one day, the next of so on, what is the limiting distance which it of the solution o	
Question 14 In a geometric progression the sum of first 3	W term of the series is S and the sum of first
2X terms of the series is 12s /133. If the sum	
value of `k' it is given that the common differ	

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(a) 120 (b) 133 (c) 155 (d) 160 <u>Question 15</u> In a infinite geometric progression with common ratios less than 1 the sum of any two consecutive terms is 8 times the sum of all the terms that follow. What is the ratio of any term and the sum of all the terms that follow it? (a) 2 (b) -2 (c) -4 (d) Cannot be determined <u>Question 16</u> In an arithematic progression, the sum of the first 10 terms is half the sum of first 15 terms. Find the ratio of the sum of first 16 terms and first 21 terms of some AP. (a) 7:11 (b) 6:10 (c) 12:17 (d) 8:13 ANSWERS AVAILABLE ON: • TELEGRAM CHANNEL: tme/KINSHUKInstitute • WEBSITE :WWW.KITESTIN • KITEST APP	6262969699	For Enquiry – 6262969604
In a infinite geometric progression with common ratios less than 1 the sum of any two consecutive terms is 8 times the sum of all the terms that follow. What is the ratio of any term and the sum of all the terms that follow it? (a) 2 (b) -2 (c) -4 (d) Cannot be determined Question 16 In an arithematic progression, the sum of the first 10 terms is half the sum of first 15 terms. Find the ratio of the sum of first 16 terms and first 21 terms of some AP. (a) 7:11 (b) 6:10 (c) 12:17 (d) 8:13 ANSWERS AVAILABLE ON: • TELEGRAM CHANNEL: t.me/KINSHUKInstitute • WEBSITE :WWW.KITest.IN • KITest APP		
(c) -4(d) Cannot be determinedQuestion 16In an arithematic progression, the sum of the first 10 terms is half the sum of first 15terms. Find the ratio of the sum of first 16 terms and first 21 terms of some AP.(a) 7:11(b) 6:10(c) 12:17(d) 8:13ANSWERS AVAILABLE ON:• TELEGRAM CHANNEL: t.me/KINSHUKInstitute• WEBSITE : WWW.KITest.IN• KITest APP		In a infinite geometric progression with common ra consecutive terms is 8 times the sum of all the terms
In an arithematic progression, the sum of the first 10 terms is half the sum of first 15 terms. Find the ratio of the sum of first 16 terms and first 21 terms of some AP. (a) 7:11 (b) 6:10 (c) 12:17 (d) 8:13 ANSWERS AVAILABLE ON: • TELEGRAM CHANNEL: t.me/KINSHUKInstitute • WEBSITE :WWW.KITest.IN • KITest APP		
 TELEGRAM CHANNEL: t.me/KINSHUKInstitute WEBSITE :<u>WWW.KITest.IN</u> KITest APP 		In an arithematic progression, the sum of the first 1terms. Find the ratio of the sum of first 16 terms and(a) 7:11(b) 6:1(c) 12:17(d) 8:1
PAST EXAMINATION QUESTIONS:		 TELEGRAM CHANNEL: t.me/KINSHUKInstitut WEBSITE :<u>WWW.KITest.IN</u>
(12) CVALITING(TON COC) TONS:	ans.	DACT ENAMTAINTTAA
<u>MAY 2018</u>		
Question 1The sum to m terms of the series $1 + 11 + 11 + 111 + \dots$. Upto m terms is equal to:(a) $\frac{1}{81}(10^{m+1} - 9m - 10)$ (b) $) \frac{1}{27}(10^{m+1} - 9m - 10)$ (c) $)(10^{m+1} - 9m - 10)$ (d) None	qual to:	The sum to m terms of the series $1 + 11 + 11 + 11 + 111 +$ (a) $\frac{1}{81}(10^{m+1} - 9m - 10)$ (b) $)\frac{1}{27}(10)$ (c) $)(10^{m+1} - 9m - 10)$ (d) None
Answer: a Explanation: Given series: 1+11+111+m term		Explanation: Given series: 1+11+111+m term
$\frac{1}{9} [9 + 99 + 999 + \dots \text{ m term}]$ $\frac{1}{9} (10 - 1) + (100 - 1) + (1000 - 1) + 1 \dots + \text{m term}]$ $\frac{1}{9} [\frac{10.(10^{m-1})}{10 - 1} - \text{m}]$ $\frac{1}{9} [\frac{10^{m-1} - 10}{9} - \text{m}]$		$\frac{1}{9}(10-1)+(100-1)+(1000-1)+1+m \text{ term}]$ $\frac{1}{9}\left[\frac{10.(10^{m-1})}{10-1}-m\right]$
$\frac{1}{9} \begin{bmatrix} \frac{10.10^{m-1} - 10 - 9m}{9} - m \end{bmatrix}$ $\frac{1}{81} (10.10^{m-1} - 9m - 10)$		$\frac{1}{9} \left[\frac{10.10^{m-1} - 10 - 9m}{9} - m \right]$
<u>Question 2</u> A person pays Rs.975 in monthly installments; each installment is less than former by Rs.5.	an former by Rs.5.	
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The amount				
(a) 26 months	(b) 15 months			
(c) both (a) & (b)	(d) 18 months			
Answer: c				
Explanation:				
$s_n = 975$, a = 100, d = -5, n =?				
$s_n = \frac{n}{2}(2a + (n-1)d)$				
$975 = \frac{n}{2} [2 \times 100 + (n - 1)(-5)]$				
1950=n[200-5n+5]				
1950=n[205-5n]				
1950=205n-5n ²				
$5n^2 - 205n + 1950 = 0$				
$5(n^2-41n+390) = 0$				
$n^2 - 41n + 310 + 0$				
n^2 -26n-15n+390=0				
n(n-26)-15(n-26)=0				
(n-26)(n-15)=0				
If n-15=0 if n-26=0				
N=15 n=26				
The entire amount will be paid in 15 months				
Question 3 If the sum of n terms of an AP is $3n^2 - n$ and (a) 3 (c) 4 Answer: b Explanation: Let s_n be the sum of n terms of an AP with first Since $s_n = 3n^2 - n$ and $d = 6$ \Rightarrow $S_n = \frac{n}{2}(2a + (n - 1)d) = 3n^2 - n$ $= \frac{n}{2}(2a + (n - 1)6) = 3n^2 - n$ $= n(a + (n - 1)3) = 3n^2 - n$ = (a + 3n - 3) = 3n - 1 a = 2	(b) 2 (d) 1			
Question 4				
Insert two arithmetic means between 68 ar	nd 260.			
(a) 132, 196	(b) 130, 194			
(c) 70, 258	(d) none			
Answer: a				
Explanation:				
Let two A.M.'S between 68 and 260 are A ₁ , A ₂				
68, A ₁ , A ₂ :260				
$d = \frac{b-a}{n+1}$				
$d = \frac{260-68}{2+1} = \frac{192}{3} = 64$				
$A_{1} = a + d = 68 + 64 = 132$				
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A ₁ = a + 2d = 68 + 2 x 64 = 196			
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Question:1	is (a) and there its oth terms is		
If the p th term of an A.P. is 'q' and the q th term (a) p+q-r ((b) p+q+r		
	(d) p-q		
Answer: a	u) þ q		
Explanation:			
Let 1 st term of AP is 'a'			
And common different is'd'			
Given $T_p = q$			
a + (p-1)d = q (i)			
and $T_p = p$			
a+(q-1)d=p			
a+ qd - d = p (ii) Equation (i) and equation (ii)			
a + pd - d = q			
a + qd - d = p			
Pd - qd = q - p			
d(p-q) = -(p-q)			
d = -1			
Putting d = -1 in equation (i)			
a + p(-1) - (-1) = q			
a = (p + q - 1) Then, $T_r = a + (r - 1)d$			
= p + q - 1 + (r - 1)(-1)			
= p + q + 1 + (r + 1)(-1) = p+q-1-r+1			
= p+q-r			
Question 2			
The 3 rd term G.P. is $\frac{2}{3}$ and the 6 th term is $\frac{2}{81}$, ter	rm the 1 st term is		
(a) 6 ((b) $\frac{1}{3}$		
	$(d)^{3}$		
Answer: a			
Explanation:			
Let 1 st term of G.P. is 'a' and common ratio is 'r' th	nen		
Given $T_3 = \frac{2}{3}$ and $T_6 = \frac{2}{81}$			
$ar^2 = \frac{2}{3}$ (i)			
5			
$ar^5 = \frac{2}{81}$ (ii)			
Eq(2)/eq(1)			
Eq (2) / eq (1) $\frac{ar^5}{ar^2} = \frac{\frac{2}{81}}{\frac{2}{2}}$			
3			
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 $r^3 = \frac{2}{81} \times \frac{3}{2} \rightarrow r^3 = \frac{1}{27} \rightarrow r = \frac{1}{3}$ Putting $r = \frac{1}{3}$ in equation (i) $ar^2 = \frac{2}{3}$ $a = \left[\frac{1}{3}\right]^2 = \frac{2}{3} \rightarrow a \times \frac{1}{9} = \frac{2}{3}$ $a = \frac{2}{3} \times \frac{9}{1}$ a = 6 **Ouestion 3** The sum of the series -8,--6-4 ... n terms is 52. The number of terms n is: b) 12 a) 11 c) 13 d) 10 **Answer: c Explanation**: **Given series** -8, -6, -4, n term Let term (a) = -8Common difference (d) = (-6) - (-8)= -6+8 = 2 Sum of 'n ' term $(S_n) = 52$, n=? We know that $S_n = \frac{n}{2}(2a + (n-1)d)$ $52 = \frac{n}{2} [2 \times (-8) + (n-1)(2)]$ 104 = n[2n-18] $104=2n^2 - 18n$ $2n^2 - 18n - 104 = 0$ $n^2 - 9n - 52 = 0$ (n-13)(n+4)=0If $n-13 \rightarrow n = 13$ and $n + 4 = 0 \rightarrow n = -4$ **Ouestion 4** The value of K, for which the mean the term 7K+3,4K-5,2K+10 are in A.P., is (b) -13 (a) 13 (c) 23 (d) -23 **Answer: d Explanation**: If 7K+3, 4K-5, 2K+10 are in A.P Then, (4K-5)-(7K+3) = (2K+10)-(4K-5)4K-5-7K-3 = 2K+10-4K+5-3K-8 = -2K+15-8-15 = -2K+3K-23 = K

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Question1

If $y = 1 + x + x^2 + \dots \infty$ then x =(a) $\frac{y-1}{2}$ (b) $\frac{y+1}{y}$ (d) $\frac{y}{y-3}$ Answer: a **Explanation**: $y = 1 + x + x^2 + \dots \infty$ is equivalent to GP = $\frac{a}{1-r}$ Y = -11-x $1 - x = \frac{1}{x}$ **Question2** If 2 + 6 + 10 + 14 + 18 + + x = 882 then the value of x (a) 78 (b) 80 (c) 82 (d) 86 **Answer: c Explanation**: 2 + 6 + 10 + 14 + 18 + + x = 882 Sum of AP $S_m = \frac{n}{2}[2a + (n-1)d]$ $S_m = \frac{\tilde{n}}{2}[a+1]$ $882 = \frac{n}{2} [2 + x]$ (1) $882 = \frac{\tilde{n}}{2} \times 2[2 + (n-1)2]$ 882 = n[2+2n+2] $882 = 2n^2$ $N^2 = 441$ $n = \sqrt{441}$ n = 21 Put n in eq 1 $882 = \frac{21}{2} [2 + x]$ 84 = 2 + xX = 84 - 2 = 82**Question 3** In a G.P, if the fourth term is '3' then the product of first seven terms is (a) 3⁵ (b) 3⁷ (c) 3⁶ (d) 3^8 **Answer: b**

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Explanation:

Let first term be a and common ratio be r. Then according to question $ar^3 = 3$ Product of 1st 7 terms (a)⁷(r)²¹ = (ar³)⁷ = (3)⁷

Question 4

The ratio of sum of n terms of the two AP's is (n + 1): (n - 1) then the ratio of their mth terms is (a) (m + 1): 2m (b) (m + 1): (m - 1)

(d) m : (m - 1)

(c) (2m - 1: (m + 1))Answer: d Explanation: $\frac{\frac{n}{2}[2a+(n-1)d]}{\frac{n}{2}[2a'+(n-1)d']} = \frac{n+1}{n-1}$ $\frac{a+\frac{(n+1)d}{2}}{\frac{a'+(n-1)d'}{2}} = \frac{n+1}{n-1}$ T_n th = a+ (n - 1) d $\frac{n-1}{1} = n - 1$ n - 1 = 2n - 2 n = 2m - 2 + 1 n = 2m n = 2m - 1 $\frac{2m}{2m-2} = \frac{2m}{2(m-1)} = \frac{m}{m-1}$

Question 5

The sum of the series 0.5+0.55+0.555+ to n terms is:

a) 5n/9+5/9[1-(*0.1)ⁿ] c) 5n/81 +5/81[1-(0.1)ⁿ] b) 5n/9-5/81[1-(0.1)ⁿ] d) 5n/9 +5/81 [1-(0.1)ⁿ]

Answer: b Explanation:

Given series 0.5 + 0.55 + 0.555..... n terms we know that,

$$0.1 + 0.1^{2} + 0.1^{3} + \dots = \frac{0.1 (1 - 0.1^{n})}{0.9} = \frac{(1 - 0.1^{n})}{9}$$

$$\Rightarrow 5(0.1 + 0.11 + 0.111 + \dots)$$

$$\Rightarrow 5\left(\frac{1}{10} + \frac{11}{100} + \frac{111}{1000} + \dots\right)$$

$$\Rightarrow \frac{5}{9}\left(\frac{9}{10} + \frac{99}{100} + \frac{999}{1000} + \dots\right)$$

$$\Rightarrow \frac{5}{9}\left(\left(1 - \frac{1}{10}\right) + \left(1 - \frac{1}{100}\right) + \left(1 - \frac{1}{1000}\right) + \dots\right)$$

$$\Rightarrow \frac{5}{9}\left(1 + 1 + \dots \text{ n terms}\right) - \left(\frac{1}{10} + \frac{1}{100} + \frac{1}{1000} + \dots\right)$$

$$\Rightarrow \frac{5}{9}\left(n - \frac{(1 - 0.1^{n})}{9}\right)$$

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Question 1

If $\frac{(b+c-a)}{a}$, $\frac{(c+a-b)}{b}$, $\frac{(a+b-c)}{c}$ are in AP then a, b, c are in b) GP a) AP c) HP d) None Answer: (c) **Explanation:** Given: $\frac{(b+c-a)}{a}$, $\frac{(c+a-b)}{b}$, $\frac{(a+b-c)}{c}$ are in A.P. Add 2 to each $\frac{(b+c-a)}{a} + 2, \frac{(c+a-b)}{b} + 2, \frac{(a+b-c)}{c} + 2$ $= \frac{b+c-a+2a}{a}, \frac{c+a-b+2b}{b}, \frac{a+b-c+2c}{c}$ $= \frac{a+b+c}{a}, \frac{a+b+c}{b}, \frac{a+b+c}{c}$ Now, divide by a+b + c $=\frac{1}{a},\frac{1}{b},\frac{1}{c}$ are in A.P. We know, HP = $\frac{1}{AP}$ = a, b, c are in H.P. : Option c i.e. H.P is the correct option, **Question 2** Sum upto infinity of series $\frac{1}{2} + \frac{1}{3^2} + \frac{1}{2^3} + \frac{1}{3^4} + \frac{1}{25^2} +$ (a) 19/24 (b) 24/19 (c) 5/24 d) none Answer: (a) **Explanation:** We know $S\infty = \frac{a}{1-r}, r < 1$ Here, $\frac{1}{2} + \frac{1}{3^2} + \frac{1}{2^3} + \frac{1}{3^4} + \frac{1}{25^2} + \dots$ $\left(\frac{1}{2} + \frac{1}{3^3} + \frac{1}{2^5} + \dots + \infty\right) + \frac{1}{2} + \frac{1}{3^3} + \frac{1}{2^5} + \dots + \infty$ $\left\{a = \frac{1}{2}, r = \frac{1}{4} < 1\right\}; \left\{a = \frac{1}{2}, r = \frac{1}{4}, 1\right\}$ $\left(\frac{\frac{1}{2}}{1-\frac{1}{4}}\right) + \left(\frac{\frac{1}{9}}{1-\frac{1}{9}}\right)$ $\frac{\frac{1}{2}}{\frac{3}{4}} + \frac{\frac{1}{9}}{\frac{8}{9}}$ $\frac{1}{2} \times \frac{4}{3} + \frac{1}{9} \times \frac{9}{8}$ $\frac{2}{3} + \frac{1}{8}$

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Ouestion 3 Sum the series $\frac{1}{5}, \frac{1}{5^2}, \frac{1}{5^3}, \dots, \frac{1}{5^n}$ $(b)\frac{1}{5}\left[1-\left(\frac{1}{4}\right)^n\right]$ $(a) \frac{1}{4} \left[1 - \left(\frac{1}{5}\right)^n \right]$ (c) both (d) none Answer: (a) **Explanation:** Series $\frac{1}{5}, \frac{1}{5^2}, \frac{1}{5^3}, \dots, \frac{1}{5^n}$ So, here $a = \frac{1}{5}$, $r = \frac{1}{5}$, $\frac{1}{5} < 1$ Sn= $a\frac{(1-r^n)}{(1-r)}$, r < 1 $\operatorname{Sn} = \frac{1}{5} \left[\frac{1 - \left(\frac{1}{5}\right)^n}{1 - \left(\frac{1}{5}\right)} \right]$ $\operatorname{Sn} = \frac{1}{5} \times \frac{5}{4} \left[1 - \left(\frac{1}{5}\right)^n \right]$ $\operatorname{Sn} = \frac{1}{4} \left[1 - \left(\frac{1}{5}\right)^n \right]$ **Question 4** Find the no. of terms of the series 25, 5, 1..... $\frac{1}{3125}$ (b) 7 (a) 6 (d) 9 (c) 8 Answer: (c) **Explanation**: Here gives the series 25, 5, 1/5.... Let the Total Number of Terms = n First Term a = 25 Common ratio r = 1/5Last Term $a_n = \frac{1}{3125}$ we have the formula $a_n = \operatorname{ar}^{n-1}$ \rightarrow n - 3 = 5 \rightarrow n = 8 Yes, 1/3125 is the 8th term of the series. **Ouestion 5** If the sum of five terms of AP is 75. Find the third term of the series. (a) 35 (b) 30 (d) 20(c) 15 Answer: (c) **Explanation:** For more Info Visit - www.KITest.in

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6. 27

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We know $S_n = \frac{n}{2} [2a + (n-1) d]$ n=5 S5 = 75 $S_5 = \frac{5}{2}[2a+(5-1)d]$ $75 = \frac{5}{2}[2a + 4d]$ 15 = a + 2d -----Eq (1) $T_3 = a + (3 - 1) d$ $T_3 = a + 2d$ -----From Eq (1) $T_3 = 15$ **Ouestion6** If the AM and GM of the two numbers is 6.5 and 6 the no's are: (a) 3 and 2 (b) 9 and 4 (c) 81 and 16 (d) None Answer: (b) **Explanation**: Let the two nos.be 'a' and 'b' AM = $\frac{a+b}{2}$; $GM = \sqrt{ab}$ $\sqrt{ab} = 6$ $\frac{a+b}{b} = 6.5$ On squaring 2 ab = 36 ----Equation (2) a +b = 13 a = 13 – b ----Equation (1) Put Eq (1) in Eq (2) $b \times (13 - b) = 36$ $13b - b^2 = 36$ $b^2 - 13b + 36 = 0$ $b^2 - 9b - 4b + 36 = 0$ b(b-9) - 4(b-9) = 0b = 4b = 9 a = 13 – 9 a = 13 - 4 a = 4 a = 9 So the two numbers are 4 and 9 **Ouestion: 7** If AM and HM for numbers are 5 and 3:2, respectively GM will be (a) 20 (c) 16 (c) 4 (d) 5 Answer:(c) **Explanation**: We know that $(GM)^2 = AM \times HM$ Here $(GM)^2 = 5 \times 3.2$ $(GM)^2 = 16$

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(GM) = 4.		
D	<u>DEC 2020</u>	
<u>Ouestion 8</u>		
The 20 th term of arithmetic progression	whose 6 th term is 38 and 10 th term is 66	is
(a) 136	(b) 118	
(c) 178	(d) 210	
Answer: a		
Explanation: Let a and d be the first term and common di	ifference of an AP	
It is given that, 6^{th} term $a_6 = 38$ and 10^{th} term		
Therefore,		
a + 5d = 38 (i)		
$a + 9d = 66 \dots (ii)$		
Subtracting (i) from (ii), we have 4d = -28		
4d = -28 d = 7		
Substituting in (i), we have		
a + 5(7) = 38		
Hence, the 20 th term is 136.		
Question 9 Three numbers in G.P with their sum is 1	130 and their product is 27 000 are	
(a) 90, 30, 10	(b) 10, 30, 90	
(c) 10, 20, 30	(d) Both	
Answer: d		
Explanation:		
Let the three number be $\frac{a}{r}$, a, ar		
$\frac{a}{r} + a + ar = 130$		
r a a a a a a a a a a a a a a a a a a a		
$\frac{a}{r}$. $a. ar = 27000 \rightarrow a^3 = (30)^3$		
= 30		
$a\left[\frac{1+r+r^r}{r}\right] = 130$		
$\begin{bmatrix} r & J \\ 1+r+r^r & 13 \end{bmatrix}$		
$\frac{1+r+r^r}{r} = \frac{13}{3}$		
\rightarrow 3r ^r -10r +3		
\rightarrow r=3 or $\frac{1}{3}$		
The numbers are 10, 30, and 90		
Question 10		
Divide 69 into 3 parts which are in A.P a	nd are such that the product of first two	parts is 460
(a) 20, 23, 26	(b) 21, 23, 25	F
(c) 19, 23, 27	(d)22, 23, 24	
Answer: a		
Explanation:		
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Let the first term of the AP be 'a' And the common difference be 'd' Since 69 split into 3 parts such that they form an AP. Let the three parts be (a - d), (a) and (a + d). Therefore, (a - d) + (a) + (a + d) = 693a = 69 a = 23 The product if two smaller parts = 460So, $(a) \times (a - d) = 460$ $23 \times (23 - d) = 460$ \Rightarrow 529 - 23d = 460 \Rightarrow - 23d = 460 - 529 \Rightarrow - 23 d = - 69 \Rightarrow d = 63/23 \Rightarrow d = 3 Therefore, The 3 parts are 23 - 3 = 20;And 23 + 3 = 26Hence the parts of the given AP are 20, 23, and 26

<u>JAN 2021</u>

Ouestion 1 The nth term of the series 3 + 7 + 13 + 21 + 31 + ... is (b) $n^2 + 2n$ (a) 4n - 1 (c) $n^2 + n + 1$ (d) $n^3 + 2$ Answer: c **Explanation**: $3 + 7 + 13 + 21 + \dots a_{n-1} + a_n$ -----(1) $3 + 7 + 13 + 21 + \dots a_{n-2} + a_{n-1} + a_n$ (2) Eq 1 – Eq 2 $s-s = 3-0+(7+3) + (13-7) + \dots + (a_{n-1} - a_{n-2} + (a_n - a_{n-1}) - a_n)$ $0 = [3+4+6+\dots+a_{n-1}] - a_n$ $a_n = 3 + [4+6+8+\dots+a_{n-1} - \dots + a_{n-1} - \dots - (3)]$ Now $4+6+8+---+a_{n-1}$ are in A.P. First term a = 4, Common difference d = 2 Sum of n herm of AP = $\frac{n}{2}[2a + (n-1)d]$ $=4+6+8\pm --a_{n-1}=\frac{n-1}{2}[2\times 4+(n-1-1)\times 2]$ $=\left(\frac{n-1}{2}\right)[8+2n-4]$ $=\frac{n-1}{2}(2n+4)$ $= (4+6+8+...+a_{n-1}) = (n-1) (n+2)$

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By Eq 3		
$a_n = 3 + [4 + 6 + 8 + \dots + a_{n-1}]$		
$a_n = 3 + (n-1) (n+2)$ = 3+ n ² -n + 2n-2		
$= 3 + n^2 - n + 2n - 2$ $a_n = n^2 + n + 1$		
$a_n - 11^- + 11^+ + 1$		
Question 2		
-	are neither divisible by 3, nor by 5 nor by 7, is	
(a) 67	(b) 55	
(c) 45	(d) 33	
Answer: c		
Explanation:		
Total No. – 100		
divide by 3 = 100/3 = 33 divide by 5 = 100/5 = 20		
divide by $7 = 100/7 = 14$		
= 33+20+14 = 67		
00.20.11 0/		
3& 5 = 100/15=6		
5& 7 = 100/35=2		
7& 3 = 100/21=4		
= 6+2+4 = 12		
= 67-12 = 55		
Total Divisible by 3,5&7 are 55 Total –divisible = not divisible		
100-55 = 45		
100-33 - 43		
Ouestion 3		
	erms are respectively, 1 and -1/8. The first term	
(a) and common ratio are respectively.		
(a) 4 and $\frac{1}{2}$	(b) 4 and $\frac{-1}{4}$	
(c) 4 and $\frac{2}{2}$	(d) 4 and $\frac{1}{4}$	
	(c) ¹ ⁴ ⁴	
Answer: c		
Explanation:		
By option c		
a=4 & r = -1/2 Check 3^{rd} GP		
$1/2 \times 4 ====(4 \text{ time equals to}) = 1$		
checking 6 th GP		
$1/2 \times 4 =====(7 \text{ time equals to}) = -0.125$		
=-1/8 = 0.125		
IUL	<u>Y 2021</u>	
Ouestion 1		
-	+ Must be taken so that the sum may be 480	
(a) 20	(b) 10	
(c) 15	(d) 25	
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Answer: Options (a) Explanation: 5 + 7 + 9 ----a = 5, d = 2, s = 480S = n/2 (2a + n - 1) d $480 = \frac{n}{2} (2 (5) + (n - 1) (2))$ $480 = \frac{n}{2}(10 + 2n - 2)$ 480 = n(2n + 8) $480 = 2n^2 + 8n$ $2n^2 + 8n - 480$ $2(n^2 + 4n - 480)$ \Rightarrow n² + 4n - 480 $n^2 + 20n + 24n - 480$ n(n-20) + 24(n-20) $\begin{array}{c} n+24 = 0 \\ -24 \end{array} \qquad \begin{array}{c} n-20 = 0 \\ n = 20 \end{array}$ n = -24

Question 2The fifth term of an AP of n terms, whose sum is $n^2 - 2n$, is(a) 5(b) 7(c) 8(d) 15Answer: Options (b)Evaluation:

Explanation:-Given: Sum of n terms of an AP = $n^2 - 2n$. To find: The fifth term =? Sum of 'n' terms of an AP = $n^2 - 2n$ ∴ Sum of 1st 5 terms \Rightarrow s₅ = 5² - 2.(5) $\Rightarrow 25 - 10 = 15$ Similarly, Now, sum of first 4 terms $S_5 = 5^2 - 2.(5)$ = 25 - 10 = 15 Similarly. Now, sum of first 4 terms $S_4 = 5^2 - 2.(4)$ = 16 - 8 = 8∴ The 5th term of an AP" $\Rightarrow t_5 = S_5 - S_4 \qquad \dots, (Using T_n = S_n - S_{n-1})$ = 15 - 8 = 7 So, option 2 is correct.

Question 3

The sum of three numbers in a geometric progression is 28. When 7, 2 and 1 are subtracted from the first, second and third numbers respectively, then the resulting numbers are in

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arithmetic progression. What is the sum of squ	
(a) 510	(b) 456
(c) 400	(d) 336
Answer: Options (d)	
DEC	<u>2021</u>
Question 1 If the sum and product of three number in G.P.	are 7 and 8 respectively, then 4 th term of the
series is	
(a) 6	(b) 4
(c) 8	(d) 16
Answer: d Explanation:-	
$t_n = ar^{n-1}$	
Let the three terms of G.P. be a/r, a and ar respect Since the product is 8, we have:	ively.
$\frac{a}{r} \times a \times ar = 8$	
$a^3 = 8$ A = (8) ^{1/3} = 2	
Also, it is given that $\frac{a}{r} + a + ar = 7$	
$\frac{a+ar+ar^2}{r} = 7$	
$a+ar+ar^2 = 7r$ Putting the value of a=2 above, we get:	
$2+2r+2r^2 = 7r$ $2r^2+2r-7r+2=0$	
$2r^2-5r+2=0$ $2r^2-4r-r+2=0$	
2r(r-2) - (r-2) = 0 (2r-1) (r-2) = 0	
So, either $2r-1 = 0 - r = \frac{1}{2}$	
0r r-2 = 0 -r = 2	
Taking r= 1/2, we have $t_4 = 2\left[\frac{1}{2}\right]^3 = 0.25$	
Taking $r= 2$, we have $t_4 = 2$ (2) ³ = 16 Since 0.25 is not in the options, option(d) is the ar	nswer.
Question 2 The sum of series 7+14+21+ To 17 th term is:	
(a) 1071 (c) 1171	(b) 971 (d) 1271
Answer: a	
Explanation:- Clearly, this is an AP with a=7; d=14-7=7 ; n= 17	
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 $S_n = \frac{n}{2} \{2a + (n-1) d\}$ $S_{17} = \frac{17}{2} \{(2 \times 7) + 17 - 1) 7\} = 1,071$

Question 3

The sum of first n terms an AP is $3n^2 + 5n$. The series is:

(a) 8, 14, 20, 26,(b) 8, 22, 42, 68, ...(c) 22, 68, 114,(d) 8, 14, 28, 44, ...

Answer:

Explanation:- $S_1 = t_1 = a = 3(1)^2 + 5(1) = 3 + 5 = 8$ $S_2 = 3(2)^2 + 5(2) = 22$ $t_2 = 22 - 8 = 14$ $d = t_2 - t_1 = 14 - 8 = 6$

Question 4

The largest value of n which $\frac{1}{2} + \frac{1}{2^2} + \cdots + \frac{1}{2^n} < 0.998$ is

(a) 9			(b) 6
(c) 7			(d) 8

Answer: d

Explanation:-The given series is a GP with $a = \frac{1}{2}$; $r = \frac{1}{2}$ Since r<1, $S_n = a \left[\frac{1 - r^n}{1 - r} \right]$ Try the options, Option (a) -9If n = 9 $S_9 = \frac{1}{2} \left(\frac{1 - (1/2)^9}{1 - (1/2)} \right) = 0.998046875$ Option (b) - 6If n=6 $S_6 = \frac{1}{2} \left(\frac{1 - (1/2)^6}{1 - (1/2)} \right) = 0.984375$ Option (c) -7If n=6 $S_7 = \frac{1}{2} \left(\frac{1 - (1/2)^7}{1 - (1/2)} \right) = 0.9921875$ Option (d) - 8If n=8 $S_8 = \frac{1}{2} \left(\frac{1 - (1/2)^8}{1 - (1/2)} \right) = 0.99609375$ Clearly, option (d) is the answer as it is the largest value for which the sum of the series is less than 0.998.

JUNE 2022

<u>Question 1</u> The nth term of the series 9,7,5,..... and 15,12,9,.....are same. Find the nth term?

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) 8
(c) 9 (d) 10
Answer: Options (a)	
Explanation:	
Given Series	
9, 7, 5n term a = 9, d = 7 – 9 = - 2, n =n	
$T_n = a + (n - 1) d$	
$T_n = 9 + (n - 1)(-2)$	
= 9 - 2n + 2	
= 11 - 2n	
and other series	
= 15,12,9n term a = 15, d = 12 – 15 = -3, n = n	
a = 15, d = 12 - 15 = -5, n = n $T_n = a + (n - 1) d$	
= 15 + (n - 1)(-3)	
= 15 - 3n + 2 = 18 - 3n	
= 11 - 2n	
Given n th term of both series are equal	
then $11 - 2n = 18 - 3n$ 3n - 2n = 18 - 11	
n = 7	
11 – 7	
Question 2	
Then sun of first 8 terms of a G.P is five times the s	sum of the first 4 terms. Find the common
ratio?) 16
) 16
(c) $\frac{1}{2}\sqrt{20}$ (d)) 4
Answer: Options (a)	
Explanation:	
Let 1^{st} term of G.P = a Common Ratio (r) = r	
Given	
$S_8 = 5 S_4$	
$\frac{a(r^8 - 1)}{r - 1} = 5\frac{a(r^4 - 1)}{r - 1}$	
$\frac{r-1}{r-1} = 5 \frac{r-1}{r-1}$	
$r^8 - 1 = 5(r^4 - 1)$	
$(r^4)^2 - (1)^2 = 5(r^4 - 1)$ $r^4 + 1 = 5$	
$r^4 = 4$	
$(r^2)^2 = (2)^2 \Rightarrow r = \pm \sqrt{2}$	
Question 3 A normalized \overline{X} 0.75 in monthly instally on the sector	
A person pays ₹ 975 in monthly instalments; each amount of 1 st instalments is ₹100. In what time wi	
) 15 months
) 18 months
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Answer: Options (a) Explanation:

Explanation: Given Sn = 975, 1st Installment (a) = 100, d = -5 Then series is 100, (100-5), (100 -5-5), ..n term 100, 95, 90, n term Sn = $\frac{n}{2}$ [2a + (n - 1)d] 975 = $\frac{n}{2}$ [2 × 100 + (n - 1)(-5)] 975 × 2 = n[200 - 5n + 5] 1950 = n (205 - 5n) 1950 = 205 n - 5n² 5n² - 205n + 1950 = 0 or n² - 41n + 390 = 0 Solving this we get n = 15 or n = 26 (not valid)

DEC 2022

Ouestion 1 If pth term of an AP is q and its qth term is p, then what will be the value of (p+q)th term? a) 0 b) 1 c) p+q-1 d) 2(p+q-1) **Answer: Options (a) Explanation:**-In the given AP, let the first be a and the common difference be d. Then, Tn = a + (n-1) d \rightarrow Tp = a+(p-1) d = q (1) \rightarrow Tq= a + (q-1) d = p(2) On subtracting (i) from (ii), we get: (q-p) d= (p-c)→d= -1 Putting d = -1 inn, we get a= (p+q -1) Thus , a = (p+q - 1) and d = -1Now, $T_{p+q} = a + (p+q-1)d$ = (p+q-1) + (p+q-1)(-1)= (p+q-1)- (p+q-1) = 0**Ouestion 2** In a G.P. 5th term is 27 and 8th term is 729. Find its 11th term. a) 729 b) 6561 c) 2187 d) 19683 **Answer: Options (d) Explanation:-**Given, $a_5 = 27$ and $a_8 = 729$. $=>ar^4 = 27$ and $ar^7 = 729$ On dividing we get, $r^3 = 27 \Rightarrow r=3 \Rightarrow r=3$

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 $\substack{\Rightarrow\Rightarrow a=27 \ / \ (3^4)=1/3 \\ \Rightarrow\Rightarrow a_{11}=ar^{10}=(1/3) \ (3^{10})=3939=19683. }$

Question 3

 Find the missing number in the following series?

 3, 5, 5, 19, 7, 41, 9, ?, 11, 109

 a) 71
 b) 61

 c) 69
 d) 79

 Answer: Options (a)

 Explanation:

 First series: 3, 5, 7, 9

 Second series: 5, 19, 41,?

 Difference of Second series are 14, 22, 30 etc

 Next term is 41+30 i.e equal to 71

Question 4

Find the next number in the given sequence?

11, 17, 39, 85, ?, 281, 447	11	, 17	, 39,	85,	?, 2	281,	447
-----------------------------	----	------	-------	-----	------	------	-----

	133	b)	143
c)	153	d)	163

Answer: Options (d) Explanation:-11

 $11 + (3^2 - 3) = 17$ $17 + (5^2 - 3) = 39$

 $39 + (7^2 - 3) = 85$

 $85 + (9^2 - 3) = 163$

Hence, the next number in the given sequence is 163. Hence, option 4 is the correct answer.

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<u>CHAPTER - 7</u> SETS, RELATIONS AND FUNCTIONS				
	Subset Relation	Theory Types of Sets Function		
	Types of Relations	Types of Functions		
A set is defined to be a collection of well – defined distinct objects. This collection may be listed or described. Each object is called an element of the set. We usually denote sets by capital letters and their elements by small letters SET Singleton set A set containing one element is called				
	Singleton set Equal set	A set containing one element is called singleton Two sets A & B are said to be equal, written as A = B if every element of A is in B and every element of B is in A.		
VENN DIAGRAMS	A venn diagram is a diagram that shows all possible logical relation between a fine collections of different sets. These diagram depict			
EQUIVALENT SET		are said to be equivalent if n (A) = n (B).		
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POWER SET	The collection of all possible subsets of a given set A is called the power set of A, to be denoted by P(A). 1. A set containing n elements has 2 ⁿ subsets. 2. A set containing n elements has 2 ⁿ⁻¹ proper subsets	
PRODUCT SETS	Ordered Pair Cartesian Product of sets	Two elements a and b, listed in a specific pair, denoted by (a, b). If A and B are two non-empty sets, then the set of all ordered pairs (a, b) such that a belongs to A and b belongs to B, is called the Cartesian product of A and B, to be denoted by $A \times B$. Thus, $A \times B = \{(a, b) : a : A and b : B\}$ If
RELATION AND FUNCTION	and any relation from have the same first ele Let A and B be two not which associates to ea	duct set X,Y is said to define a relation from X to Y X to Y in which no two different ordered pairs ements is called a function. n-empty sets. Then, a rule or a correspondence f ich element x of A, a unique element, denoted by ction or mapping from A to B and we write f :
DOMAIN & RANGE OF A FUNCTION	domain off.	alled the domain of f, while B is called the co- =A } is called the range of f.

VARIOUS TYPES OF FUNCTION

IDENTITY FUNCTION	•Let A be a non-empty set . Then, the function I defined by I : A * A : I (x) = x for all x =A is called an identity function on A
EQUAL FUNCTION	•Two functions f and g are said to be equal, written as f = g if they have the same domain and they satisfy the condition f(x) = g(x), for all x.
INVERSE FUNCTION	•Let f be a one-one onto function from A to B. Let y be an arbitrary element of B. Then f being onto, there exists an element x in A such that f (x) = y A function is invertible if and only if f is one-one onto.

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ONE -ONE	FUNCTION	•Let f : A*B. If different elements in A have different images in B, then f is said to be a one-one or an injective function or mapping
ONTO or SURJECTIVE FUNCTION		•Let f : A*B. If every element in B has at least one pre- image in A, then f is said to be an onto function. If f is onto, then corresponding to each y = B, we must be able to find at least one element x 🛛 A such that y = f (x)Clearly, f is onto if and only if range of f = B
BIJECTION	FUNCTION	•A one-one and onto function is said to be bijective
Different types of relations	 S×S i) If R contareflexive For example, 'I ii) If (a, b) = For Example, a relation. <i>iii</i>) If (a, b) = transitiv For Example a relation. A relation whi an <i>equivalence</i> equivalence reference Similarly, the reference 	= b, b = c ,a = c. Hence the relation 'is equal to' is a transitive ch is reflexive, symmetric and transitive is called <i>relation</i> or simply equivalence. 'is equal to' is an
Domain & Range of a relation	of R is called the	n from A to B, then the set of all first co- ordinates of elements ne domain of R, while these to fall second co-ordinates of is called the range of R.
Questions ? Ansv	? vers ?	
Question1 Which of the fo (a) { }	llowing statem	ents is used to create an empty set? (b) Set ()
(c) []		(d) ()
Answer: b Explanation: { } Creates a dict		Only set () creates an empty set. more Info Visit - www.KITest.in 7.3

Question 2

What is the output of the following piece of code when executed in the python shell?(a) { 2, 3 }(b) Error, duplicate item present in list(c) Error, no method called intersection(d) { 1, 4, 5 }update for set data typeanswer: aExplanation:The method intersection update returns a set which is an intersection of both the sets.

Question 3

Which of the following lines code will result is an error?			
(a) {abs}	(b) s = {4, 'abc', (1,2) }		
(c) { 1, 2, 5, 9}	(d) {1, 5, 7, 9, 11}		

Answer: d

Explanation:

The line: s={san} will result is an error because 'san' is not defined. The line s={abs} does not result in an error because abs is a built – in function. The other sets shown do not result in an error because all the items are hashable.

Question 4

 What is the output of the code shown below?

 S=set ([1, 2, 3,])

 S, union ([4, 5])

 S|([4, 5])

 (a) {1, 2, 3, 4, 5} {1, 2, 3, 4, 5}

 (b) Error {1, 2, 3, 4, 5}

 (c) {1, 2, 3, 4, 5} Error

 Answer: c

 Explanation:

The first function in the code shown above returns the set { 1, 2, 3, 4, 5}. This is because the method of the function union allows any alterable. However, the second function results in an error because f unsupported data type that is list and set.

Question 5

What is the output of the line of code shown below, if s1 = {1, 2, 3} Is S1 subs		
(a) True	(b) Error	
(c) No output	(d) Proposition	

Allswer: a	
Explanation:	
Every set is a subset of itself and hence the output of this line of code is true.	

Question 6

A is an o	ordered	collection	of objects.
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(a) Relation	(b) Function
(c) Set	(d) Proposition

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Answer: c Explanation:	
A set is an ordered collection of objects.	
<u>Question 7</u> The set of odd positive integers less t	han 10 can be expressed by
(a) {1, 2, 3}	(b) {1, 3, 5, 7, 9}
(c) {1, 2, 5, 9} Answer: b	(d) {1, 5, 7, 9, 11}
Explanation:	
Odd numbers less than 10 is {1, 3, 5, 7, 9)}.
Question 8	
Power set of empty set has exactly	
(a) 1 (c) 0	(b) 2 (d) 3
Answer: a	(u) 5
Explanation:	
Power set of null set has exactly one sub	oset which is empty set.
Question 9	
What is the Cartesian product of $A = \{$	
(a) {(1, a), (1, b), (2, a), (b, b)} (c) {(1, a), (2, a), (1, b), (2, b)}	(b) {(1, 1), (2, 2), (a, a), (b, b)} (d) {(1, 1), (a, a), (2, a), (1, b)}
Answer: c	(u) ((1, 1), (a, a), (2, a), (1, 0))
Explanation:	
A subset R of the Cartesian Product A x	B is a relation from the set A to the set B.
Question 10	
	to the Cartesian product A x B. Is it True or False?
(a) True (c) partial true	(b) False (d) not sure
Answer: b	
Explanation:	
Let $A = \{1, 2\}$ and $B = \{a, b\}$. The Cartesia Cartesian product $B \ge A = \{(a, 1), (a, 2), ($	an product A x B = {(1, a),(1, b), (2, a), (2, b)} and the (b, 1), (b, 2)}. This is not equal to A x B
Question 11	
What is the cardinality of the set of o	dd positive integers less than 10?
(a) 10	(b) 5
(c) 3	(d) 20
Answer: b Explanation:	
	than 10 is $\{1, 3, 5, 7, 9\}$. Then Cardinality of set S = $ S $
Question 12	
Which of the following two sets are e	
(a) $A = \{1, 2\}$ and $B = \{1\}$	(b) A = $\{1, 2\}$ and B = $\{1, 2, 3\}$

(a) $A = \{1, 2\}$ and $B = \{1\}$

(b) $A = \{1, 2\}$ and $B = \{1, 2, 3\}$

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(c) $A = \{1, 2, 3\}$ and $B = \{2, 1, 3\}$ Answer: c

Explanation:

Two set are equal if and only if they have the same elements.

Question13

The set of positive integers is _____-(a) Infinite(b) Finite(c) Subset(d) EmptyAnswer: aExplanation:The set of positive integers is not finite

Question 14

What is the Cardinality of the power set of the set {0, 1, 2}.(a) 8(b) 6(c) 7(d) 9

(c) 7 Answer: a

Explanation:

Power set P ({0, 1, 2}) is the set of all subsets of {0, 1, 2}. Hence, P ({0, 1, 2}) = {null, {0}, {1}, {2}, {0, 1}, {0, 2}, {0, 1, 2}.

Question15

The members of the set S = { x | x is the square of an integer and x < 100} is ______</td> (a) {0, 2, 4, 5, 9, 58, 49, 56, 99,12} (b) {0, 1, 4, 9, 16, 25, 36, 49, 64, 81} (c) {1, 4, 9, 16, 25, 36, 64, 81, 85, 99} (d) {0, 1, 4, 9, 16, 25, 36, 49, 64, 121} Answer: b Explanation:

The set S consist of the square of an integer less than 10.

Question16

<u>vucotionito</u>			
Let the set A is the {1, 2, 3} and B is {2, 3, 4}. Then number of elements in A U B is			
(a) 4	(b) 5		
(c) 6	(d) 7		
Answer: a			
Explanation:			
AUB is {1, 2, 3, 4}			

Question 17

Let the set A is {1, 2, 3} and B is {2, 3, 4}. Then number of elements in A fit B is (a) 1 (b) 2 (c) 3 (d) 4 Answer: b Explanation: A fit B is {2, 3}

Question 18

Let the set A is {1, 2, 3} and B is {2, 3, 4}. Then the set A – B is (a) {1, -4} (b) {1,2,3}

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(C) {1}
Answer: c
Explanation:
In A – B the common elements get cancelled.

Question 19

In which of the following sets A - B is equal to B - A

(a) $A = \{1, 2, 3\}, B = \{2, 3, 4\}$ (b) $A = \{1, 2, 3\}, B = \{1, 2, 3, 4\}$ (c) $A = \{1, 2, 3\}, B = \{2, 3, 1\}$ (d) $A = \{1, 2, 3, 4, 5, 6\}, B = \{2, 3, 4, 5, 1\}$ Answer: cExplanation:A-B = B-A = Empty set.

(d) $\{2, 3\}$

Question 20

Let A be set of all prime numbers; B be the set of all even prime numbers. C be the set of all odd prime numbers, then which of the following is true? (a) A = B U C (b) B is a single on set (c) A = C U {2} (d) All of the mentioned Answer: d Explanation: 2 is the only even prime number.

Question 21

If A has 4 elements B has 8 elements, then the minimum and maximum number of elements in A U B are respectively (a) 4, 8 (b) 8, 12 (C) 4, 12 (d) None of the mentioned Answer: b Explanation: Minimum would be when 4 elements are sane as in 8, maximum would be when all are distinct.

Question 22

If A is {{ Φ }, { Φ }}, then the power set of A has how many elements? (a) 2 (b) 4 (c) 6 (d) 8 Answer: b Explanation: The set A has got 2 elements so n (P (A)) = 4.

Question 23

Two sets A and B contains a and b elements respectively. If power ser of A contains 16more elements than that of B, value of 'b' and 'a' are respectively(a) 5, 4(b) 6, 7

(c) 2, 3 (d) None of the mentioned

Answer: a Explanation: 32 – 16 = 16, hence a=5, b=4

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Ouestion 24

Let A be {1, 2, 3, 4}, U be set of all natural numbers, then U-A' (complement of A) is given by set. (b) {5, 6, 7, 8, 9,}

(d) All of the mentioned

(b) $(A - B) \cap (A - C)$

(d) None

(a) $\{1, 2, 3, 4, 5, 6, \dots\}$ (c) $\{1, 2, 3, 4\}$ **Answer: c Explanation**: U-A' = A.

Question25

Which sets are not empty?

(a) {x:x is a even prime greater than 3} (c) {x:x is an even number and x+3 is even}

Answer: d

Explanation: Because the set is {3}

Question 26

If A, B and C are any three sets, then A-(BNC) is equal to (a) (A - B) U (A - C)(c) (A – B) U C

Answer: a **Explanation**: From De Morgan's Law, $A - (B \cap C) = (A - B) U (A - C)$

Ouestion 27

Which of the following is the empty set?

(a) {x:x is a real number and $x^2 - 1 = 0$ (c) {x : x is a real number and $x^2 - 9 = 0$ Answer: d **Explanation**: Since $x^2 - 1 = 0$, given $x^2 = -1$ x = +1 \therefore No value of x is possible

Ouestion 28 If a set A has n elements, then the total number of subsets of A is (b) n^2 (a) n (c) 2ⁿ (d) 2n **Answer: c Explanation**: Number of subsets of A = $n_{c_0} + n_{c_1} \dots + n_{c_n} = 2^n$

Question29

If A and B are any two sets, then AU (ANB) is equal to		
(a) A	(b) B	
(c) A ^c	(d) B ^c	
Answer: a		

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(b) {x:x is a multiple of 2 and is odd} (d){x:x is a prime number is less than 5 and is odd}

(b) {x:x is a real number and $x^2 + 1 = 0$ (d) {x : x is a real number and $x^2 = x + 2$

7.8

Explanation: A∩B⊆A. Hence $AU(A \cap B) = A$

Ouestion 30

If two sets A and B are having 99 elements in common, then the number of elements common to each of the sets A x B and B x A are

(a) 2⁹⁹ (c) 100 (b) 99²

(d) 18

Answer: b

Explanation: $n((A \times B) \cap (B \times A))$ $=n((A \cap B) \times (B \cap A)) = n(A \cap B) \cdot n(B \cap A)$ $= n (A \cap B) \cdot n (A \cap B) = (99) (99) = 99^{2}$

Question 31

If A = {x : x is a multiple of 4} and B = { x : x is a multiple of 6} then A \cap B consists of all multiples of? (b) 12

(d) 4

(a) 16

(c) 8

Answer: b

Explanation: $A = \{4, 8, 12, 16, 20, 24 \dots\}$ $B = \{6, 12, 18, 24, 30, \dots, A \subseteq B = \{12, 24, \dots\}$ = { x : x is a multiple of 12}.

Ouestion 32 If A = {1, 2, 3, 4, 5}, B = {2, 4, 6}, C = {3, 4, 6}, Then (AUB) ((a) {3, 4, 6} (b) {1, 2, 3} (c) {1, 4, 3} (d) None of these Answer: a **Explanation**: AUB = {1, 2, 3, 4, 5, 6} \ (AUB) NC = {3, 4, 6}

Ouestion 33 If n (A) =4, n (B) =3, n (A×B×C) =24, then n(C) = (a) 288 (b) 1 (c) 2(d) 17 **Answer: c Explanation**: n(A)=4, $n(B)=3n(A)\times n(B)\times n(C)=n(A\times B\times C)4\times 3\times n(C)=24$ $n(C) = \frac{24}{12} = 2$

Ouestion 34 If $A = \{2, 3, 5\}, B = \{2, 5, 6\}, \text{ then } (A - B) \times (A \cap B) \text{ is }$ (a) $\{(3, 2), (3, 3), (3, 5)\}$ (b) $\{(3, 2), (3, 5), (3, 6)\}$

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(c) {(3, 2), (3, 5)} Answer: c Explanation: A-B = {3}, A∩B = {2, 5} (A - B)× (A∩B) = {(3, 2); (3, 5)}

Question 35

The set of intelligent students in a class is [AMU 1998](a) A null set(b) A singleton set(c) A finite set(d) Not a well definite collectionAnswer: dExplanation:

Since, intelligence is not defined for students in a class i.e. Not a well defined collection.

(d) None of these

Question 36

If A and B be any two sets, then (ANB)' is equal to		
(a) A'NB'	(b) A'UB'	
(C) ANB	(d) AUB	
Answer: b		
Explanation:		
From De' Morgan's Law, (ANB)' = A'UB'		

Question 37

In a class of 100 students, 55 students have passed in Mathematics and 67 students have passed in physics. Then the number of students who have passed in Physics only is (a) 22 (b) 33

(d) 45

(c) 10

Answer: d

Explanation: n (M) = 55, n (P) = 67, n (MUP) = 100 Now, n (MUP) = n (M) + n (P) - n(M Ω P) 100=55+67-n (M Ω P)\n (M Ω P) = 122-100=22 Now n (P only) =n (P) - n(M Ω P) = 67-22=45

Question 38

20 teachers of a school either teach mathematics or physics. 12 of them teach mathematics while 4 teach both the subjects. Then the number of teachers teaching physics only is

(a) 12

(b) 8

(c) 16

(d) None of these

Answer: a

Explanation: Let n (P) = Number of teachers in Physics. n (M) = Number of teachers in Math's n (PUM) = n (P) +n (M)-n (PΩM) 20=n (P) +12-4 = n (P) = 12

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Question 39

In a battle 70% of the combatants lost one eye, 80% an ear, 75% an arm, 85% a leg, x% lost all the four limbs. The maximum value of x is
(a) 10
(b) 12

(d) None of these

(c) 15 Answer: a Explanation:

Minimum value of 1+ba>0 = 100 - 90 = 10

Question 40

If A and B are not disjoint sets, then n(AUB) is equal to? [Kerala (Eng.) 2001](a) n(A)+n(B)(b) $n(A)+n(B)-n(A \cap B)$ (c) $n(A)+n(B)+n(A \cap B)$ (d) n(A)n(B)n(A)-n(B)Answer: bExplanation: $n(AUB) = n(A) + n(B)-n(A \cap B)$

Question41

Let A and B be two sets such that n(A)=0.16, n(B)=0.14,n(AUB)=0.25. Then $n(A\cap B)$ is equal to (a) 0.3 (b) 0.5 (c) 0.05 (d) None of these Answer: c Explanation: $n(AUB) = n(A) + n(B) - n(A\cap B)$ $0.25 = 0.16 + 0.14 - n(A\cap B)$ $n(A\cap B) = 0.30 - 0.25 = 0.05$

Question 42

Let A and B be two sets then (AUB)'U (A' \cap B) is equal to (a) A' (b) A (C) B' (d) None of these Answer: a Explanation: From Venn-Euler's Diagram \therefore (AUB)'U (A' \cap B) = A'

Question 43

If A and B are two sets then $(A - B) U (B - A) U (A \cap B)$ is equal to (a) A U B (b) A \cap B (c) A (d) B' Answer: a Explanation: From Venn-Euler's diagram $\therefore (A - B)U (B - A) U (A \cap B)$

Question: 44

The shaded region in the given figure is:

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(a) A Π (B U C) (c) A Π (B – C) Answer: d Explanation: From Venn-Euler's diagram, A – (B U C)	(b) A U (B N C) (d) A – (B U C)
Question45If A and B are two sets, then AUB=A \cap B(a) A×B(c) A = BAnswer: cExplanation:Let X \in A \rightarrow X \in AUB, [$: A \subseteq A \cup B$]= X $\in A \cap B$, [$: A \cup B = A \cap B$]= X $\in A$ and X $\in B$ P × $\in B$, $ A \subseteq B$ Similarly X $\in B$ = X $\in A \setminus B \subseteq A$ Now $A \subseteq B$, $B \subseteq A$ = A = B	(b) B+A (d) None of these
Question 46The number of non-empty subsets of the set(a) 15(c) 16Answer: aExplanation:The number of non - empty subsets = $2^n - 1$ $2^4 - 1 = 16 - 1 = 15$	et {1, 2, 3, 4} is (b) 14 (d) 17
Question47 Which set is the subset of all given sets (a) {1, 2, 3, 4,} (c) {0} Answer: d Explanation: Null set is the subset of all given sets.	(b) {1} (d) { }
Question 48 A = {x: x≠x} represents (a) {0} (c) {1} Answer: b Explanation: It is fundamental concept.	(b) { } (d) {x}
Question 49 If A= {2, 4, 5}, B= {7, 8, 9}, then n (A × B) is a (a) 6 (c) 3 For more Info Visi	equal to (b) 9 (d) 0 t - www.KITest.in

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Answer: b

Explanation:

 $A \times B = \{(2, 7), (2, 8), (2, 9), (4, 7), (4, 8), (4, 9), (5, 7), (5, 8), (5, 9)\}$ n (A × B) = n n = 3 × 3 = 9.

Question 50

In a city 20 percent of the population travels by car, 50 percent travels by bus and 10 percent travels by both car and bus. Then persons travelling by car or bus are
(a) 80 percent
(b) 40 percent

(d) 70 percent

(c) 60 percent (d) 70 **Answer: c Explanation:** Given that, n(C) = 20%, n(B) = 50%, $n(C \cap B) = 10\%$

Population who travel by car or bus is represented by $n(C \cup B)$ We know that, $n(C \cup B) = n(C) + n(B) - n(C \cap B)$ = 20% + 50% - 10% = 60%

Hence 60% of the population travel by car or bus.

Question 51

At a certain conference of 100 people there are 29 Indians women and 23 Indian men, out of these Indian people 4 are doctors and 24 are either men or doctor. There are no foreign doctors. The numbers of women doctors attending the conference is:

(a) 2	(b) 4	
(c) 1	(d) None of these	
Answer: c		
Explanation:		
Let, M = Indian men, W = Indian women, D = Indian doctors.		
According to question, n (M U D) = 24, n (M) =	23, n (W) = 29, n (D) = 4.	
As per the set rule, $n (M U D) = n (M) + n (D) - n (M \Omega D)$. This implies, $n (M \Omega D) = 3$.		
Since, three men are doctors, therefore, number	er of women doctors = 4-3 =1	

Question 52

The minimum value of the function $f(x) = x^2 - 6x + 10$ is: (a) 1 (b) 2 (c) 3 (d) 10 Answer: a Explanation: $F(x) = x^2 - 6x + 10$ F(x) = 2x - 6 $F(x) = 0 \rightarrow 2x = 6 \rightarrow x = 3$ $F(3) 3^2 - 6 \times 3 + 10 = 19 - 18 = 1$ Question 53 If (x) = $x^3 + \frac{1}{2}$ then value of f(x) - f(1/x) is equal to

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Explanation:

$\frac{x^3}{\frac{x^3}{x^3}}$	$+\frac{1}{x^4}$	$\frac{1}{x^3} +$	<i>x</i> ⁴
	$\frac{1}{x^4}$ - 1 = 0		

Ouestion 54

The relation "Is parallel to " over the set of straight line in a given plane is: (b) Symmetric

(a) Reflexive

(c) Transitive

Answer: d

Explanation:

Equivalent relation: An equivalent relation on a set S, is a relation on S which is reflexive, symmetric and transitive. Example: Let S = Z and define $R = \{(x, y) | x \text{ and } y \text{ have the same} \}$ parity} i.e. x and y are either both even or both odd.

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(d) Equivalence Relation

Ouestion 1

If $A = [(x, y): x^2 + y^2 = 25]$ and	d B = [(x, y) : x2 + 9y2 = 144], then A ∩ B contains points.
(a) 6	(b) 8
(c) 16	(d) 4

Question 2

In a college of 300 students, every student reads 5 newspapers and every newspaper is read by 60 students. The number of newspapers is

(a) 25	(b) 18
(c) 16	(d) 78

Question 3

If $f(x) = \frac{x-3}{x+1}$, then $f[f\{f(x)\}]$ equals	
(a) f ([3+x] /[1-x])	(b) f ([89+x] /[1-x])
(c) f ([3-x] /[1-x])	(d) none

Ouestion 4

Let f: $R \rightarrow R$ be defined by f (x) = 2x + |x|, then f (2x) + f (-x) - f (x) = _____. (a) 4x (b) 2|x|(d) none (c) 3|x|

Question 5

.If f (x) = $\frac{x^2}{x^2}$	$\frac{-1}{+1}$, for every real number. Then what is the minimum value of f?
(a) 1	(b) 2
(c) 3	(d) 4

Ouestion 6

The Cartesian product A × A has 9 elements among which are found (-1, 0) and (0, 1). Find the set A and the remaining elements of $A \times A$.

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(a) (-1, -1), (-1, 1), (0, -1), (0, 0), (1, -1), (1, 0) and (1, 1) (c) Neither a or b	(b) (-1, 1), (1, 1), (0, -1), (0, 0), (1, -1), (1, -1) and (1, 1). (d) can't Justify
Question 7	
Express the function f: A—R. f(x) = x2 – 1. V (a) {(-4, 15), (0, -1), (1, 0), (4, 15)}	Where A = {-4, 0, 1, 4} as a set of ordered pairs. (b) (-1, 1), (1, 1), (0, -1), (0, 0), (1, -1), (1, -1)
(a) {(-4, 13), (0, -1), (1, 0), (4, 13)}	and (1, 1).
(c) Neither a or b	(d) . {(4, 15), (1, 1), (1, 0), (4, -15)}
Question 8	
	tion R from A to A by $R = \{(x, y): 3x - y = 0, such s range, domain, and codomain.$
If $R = \{(a, a^3): a \text{ is a prime number less than}\}$	5} ne a relation. Find the Range of R.
(a) {8,27}	(b) {-8,27}
(c) Neither a or b	(d) Both a & b
Question 10 If $R = \{(x, y): x+2y = 8\}$ is a relation on N, the	on write the range of D
(a) $\{8,2,7\}$	(b) $\{3,2,1\}$
(c) Neither a or b	(d) Both a & b
Question 11 If A= {1,2,3}; {4,5,6,7} and f={(1,4), (2,5),(3, one or not	6) is a function from A to B. State whether f is one-
(a) One - One	(b) One- Two
(C) One to Many	(d) Many to One
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Question 1

Let N be the set of all natural numbers; E be the set of all even natural numbers then the function

F: N = E defined as f(x) = 2x - VxEN is =

(a) One-one-into (c) One-one onto (b) Many-one-into (d) Many-one-onto

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Answer: c

Given $N = \{1, 2, 3, 5, 6 \dots, \infty\}$ $E = \{2, 4, 6, 8 \dots, \infty\}$ $F: N \rightarrow E$ $f(x) = 2x - V \times EN$ F(x) = -2x F(1) = 2 X 1 = 2 F(2) = 2 X 2 = 4 F(3) = 2 X 3 = 6Range of function = $\{2, 4, 6, \dots, \} = E$ And / (X1) = f) X2 $2 \times 1 = 2 \times 2 = X2$ So f(x) function is one-one and onto.

Question 2

In a town of 20,000 families it was found that 40% families buy newspaper. A₁ 20% families buy newspaper B and 10% families buy newspaper C, 5% families buy A and B, 3% buy B and C and A and C if 2% families buy all the three newspapers, then the number of families which by A only is :

which by A only 15.	
(a) 6600	(b) 6300
(c) 5600	(d) 600
Answer: a	
Explanation:	
Total Families n (u) = 20000	
No. of families who buy News	spapers 'A' n (A) = 40% of 20000 = 8000
No. of families who buy News	spapers 'B' n (B) = 20% OF 2000 = 4000
No. of families who buy News	spapers 'C'
N(c) = 10% of 20000 = 2000	
No. of families who buy News	spapers A & B
N (A Π B) = 5% OF 20000 = 1	000
No. of families who buy News	spapers B & C
n (B f C) = 3% OF 20000 = 60	00
No. of families who buy News	papers C & A
$n(C \cap A) = 4\% \text{ OF } 20000 = 80$	0
No. of families who buy all Ne	ewspapers n (A Π B Π C) = 2% OF 20000 = 400
No. of families who buy News	spapers 'A' only
$= n (A \cap B \cap C)$	
= n (A) - n (A n B) - n (A n C)	+ n (n B n C)
= 8000-1000-800+400	
= 6600	
Question 3	
	set of the set {3, 4, 5, 6, and 7} is:
(a) 32	(b) 31
(c) 30	(d) 25
Answer: b	
A = {3, 4, 5, 6, 7}	
n (A)' = 5	

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No. of proper set = 2^{n-1} $= 2^5 - 1$ = 32-1 = 31 **NOV 2018 Question 1** A is [1, 2, 3, 4] and B is {1, 4, 9, 16, and 25} if a function f is defined from to B where f(x) = x2 then the range of f is: (a) $\{1, 2, 3, 4\}$ (b) {1, 4, 9, 16} (c) {1, 4, 9, 16, 25} (d) None of these **Answer: b Explanation**: Given $A = \{1, 2, 3, 4\}$ $B = \{1, 4, 9, 16, 25\}$ If f : A - B and $f(x) = x^2$ $F(1) = (1)^2 = 1$ $F(2) = (2)^2 = 4$ $F(3) = (3)^2 = 9$ $F(4) = (4)^2 = 16$ Range off = {1, 4, 9, and 16} **Question 2** 2. If A = {1, 2} and B:; {3, 4}. Determined the number of relations from A and B (a) 3 (b) 16 (d) 6 (c) 5 **Answer: b Explanation**: Given $A = \{1, 2\}$ $B = \{3, 4\}$ $A \times B = \{1, 2\} \times \{3, 4\}$ $= \{(1, 3) (1, 4) (2, 3) (2, 4)\}$ $n(A \times B) = 4$ No. of relation from A and $B = 2^n$ $= 2^4$ =16 0r A Shortcut: A = {1,2}, n (A) = 2 $B = \{3, 4\}, n(B) = 2$ No. of relation from A and $B = 2^{m \times n}$ 22×2 $= 2^4 = 16$ **Question 3**

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If A = {1, 2, 3, 4, 5, 6, 7} and B = {2, 4, 6, 8}. Cardinal member of A - B is: (a) 4 (b) 3 (c) 9 (d) 7 Answer: a Explanation:

 $A = \{1, 2, 3, 4, 5, 6, 7\}$ $B = \{2, 4, 6, 8\}$ $A - B = \{1, 2, 3, 4, 5, 6, 7\} - \{2, 4, 6, 8\}$ $= \{1, 3, 5, 7\}$ n (A-B) = 4

Question 4

Identify the function from the following:

(a) $\{(1,1), (1,2), (1,3)\}$ (c) $\{(1,2), (2,2), (3,2), (4,2)\}$ (b) {(1, 1), (2, 1), (2, 3)} (d) None of these

Answer: c

Explanation: {(1, 2), (2,2), (3,2), (4,2)} is the function Many one function

<u>MAY 2019</u>

Question 1

If $A = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ $B = \{1, 3, 5, 7, 8\}; C = \{2, 6, 8,\}$ then find = $(A - B) \cup C$ (a) $\{2, 6\}$ (b) $\{2, 6, 8\}$ (c) $\{2, 6, 8, 9\}$ (d) None of these Answer: c Explanation: $A = \{1, 2, 3, 4, 5, 6, 7, 8, 9,\}$ $B = \{1, 3, 4, 5, 7, 8, \}$ $C = \{2, 6, 8\}$ $A - B = \{2, 6, 9\}$ $(A - B) \cup C = \{2, 6, 8, 9\}$

Question 2

If (x) = x² and x=g(x) \sqrt{x} then (a) go, f(3) = 3 (c) go, f(9) = 3 Answer: a Explanation: gof = g (f(x)) = $\sqrt{x^2}$ gof = x(1) Put this equations in above objectives Option first: go, f(3) = 3 Hence option 1 is correct

(b) go f (-3) = 9 (d) go f (-9) = 3

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Question 3

A = {1, 2, 3, 4,.....10} a relation on A, R = $\begin{cases} (x,y) \\ x+y \end{cases}$ = 10, x \square A, y \square A, X \ge Y} then Domain of R-1 is (a) {1, 2, 3, 4, 5} (b) {0, 3, 5, 7, 9} (c) {1, 2, 4, 5, 6, 7} (d) None of these Answer: a Explanation: {1, 2, 3, 4, 5} Question 4 If A = {a, b, c, d}: B = {p, q, r, s} which of the following relation is a function from A to B (a) R₁ = {(a, p), (b, q), (c, s)} (b) R₂ = {(p, a), (b, r), (d, s)} (c) R₃ = {(b, p), (c, s), (b, r)} (d) R₄ = {(a, p)(b, r)(c, q), (d, s)}

Answer: d

Explanation:

Unique mapping: A map is way of associating unique objects to every element in a given set. So a map from to is a function such that for every, there is a unique object. The terms function and mapping are synonymous for map.

NOV 2019

Ouestion 1 $(A^{T})^{T} = ?$ (a) A (b) A^T (d) A^{2T} (c) $A^{T}.A^{T}$ Answer: a **Explanation:** (a) $(AT)^{T} = A$ Example A = $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$ A^T = $\begin{pmatrix} 1 & 3 \\ 2 & 4 \end{pmatrix}$ (A^T)^T = $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$ = A So, $(A^T)^T = A$ **Ouestion 2** F(n) = f(n-1) + f(n-2) when n = 2, 3, 4f(0) = 0, F (1) = 1 then f (7) =? (b) 5(a) 3(c) 8 (d) 13 Answer: d **Explanation**: (d) F(n) = f(n-1) + f(n-2)F(2) = f(1) + f(0) = 1 + 0 = 1 = f(2)F(3) = f(2) + f(1) = 1 + 1 = 2 = f(3)F(4) = f(3) + f(2) = 2+1 = 3Similarly,

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f(7) = f(6) + f(5) f(7) = [f(5) + f(4) + [f(4) + f(3)] f(7) = [f(4) + f(3) + f(4)] + (f(4) + f(3)] f(7) = [3 + 2 + 3] + [3 + 2]r(7) = 13

Question 3

 $f(x) = x + \frac{1}{x} find f^{-1}(y)$ (a) $\frac{1}{(x-1)}$ (b) $\frac{1}{(y-1)}$ (c) 1_1 (d) x Answer: a **Explanation**: (a) $F(x) = \frac{x+1}{x}$Equation (1) Let f(x) = y $X = f^{-1}(y)$ **Further Solving**Equation (1) $Y = \frac{x+1}{x}$ XY = x + 1 = xy - x = 1 = x(y - 1) = 1 $\mathbf{X} = \frac{1}{(y-1)}$ $f^{-1}(y) = \frac{1}{(y-1)}$ $f^{-1}(y) = \frac{1}{(x-1)}$

DEC 2020

Question 1

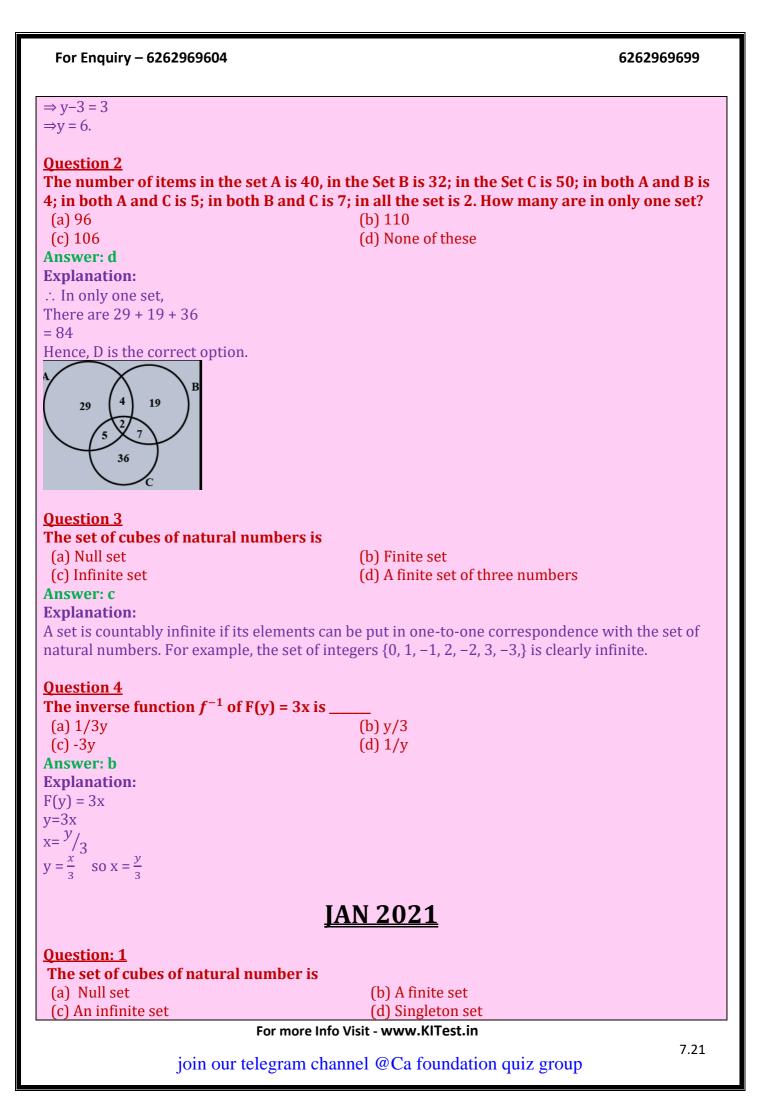
Two finite sets respectively have x and y number of elements. The total number of subsets of the first is 56 more than the total no. of sub sets of the second. The values of x,y are respectively

(b) 6 and 3

(d) 3 and 6

(a) 4 and 2 (c) 2 and 4 Answer: d **Explanation**: Let A has x elements Let B has y elements Total number of students of A=2^m Total number of students of B=2ⁿ It is given $\Rightarrow 2^{m}-2^{n}=56$ 2y(2x-y-1)=56 \Rightarrow 2^y=even and 2^{x-y}-1=0 Basic odd Now, 56=8×7=2³×7 $\Rightarrow 2^{y} (2^{x-y}-1) = 2^{3} \times 7$ ⇒n=3 Now, $8(2^{y-3}-1) = 8 \times 7$ $\Rightarrow 2^{y-3}-1=7$ $\Rightarrow 2^{y}-3=8=2^{3}$

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Explanation: The set of cubes of the natural numbers is an infinite set. Question: 2 In the set of all straight lines on a plane which of the following is Not True? (a) Parallel to' an equivalence relation (b) Perpendicular to' is a symmetric relation. Answer: c Explanation: Perpendicular to' is an equivalence relation (d) Parallel to' is a reflexive relation. Answer: c Explanation: Perpendicular to' is an equivalence relation Question: 3 Let F. R \Rightarrow Nb de defined by $F(x) = \begin{cases} 2x \ for \ x > 3 \\ 3x \ for \ x \le 1 \end{cases}$ The value of [-1] + f(2) + f(4) is (a) 9 (b) 14 (c) 5 (d) 6 Answer: a Explanation: Given that $f(x) = \begin{cases} 2x \ for \ x > 3 \\ 3x \ for \ x \le 1 \end{cases}$ f(-1) = 3(-1) = -3 $f(2) = 2^2 = 4$ f(4) = 2(4) = 8 = -3 + 4 + 8 = 9 LULY 2021 Question 1 Let U be the universal set, A and B are the subsets of U. If n (U) = 650, n (A) = 310, n (A \cap B) = 95 and n (B) = 190, then n(A \cap B) is equal to (A and B are the complete of A and B are the subsets of U. If n (U) = 650, n (A) = 310, n (A \cap B) = 95 and n (B) = 190, then n(A \cap B) is equal to (A and B are the complete of A and B are the subset of U. If n (U) = 650, n (A) = 310, n (A \cap B) = 95 and n (B) = 190, then n(A \cap B) is equal to (A and B are the complete of A and B are the subset of U. If n (U) = 650, n (A) = 310, n (A \cap B) = 95, n (B) = 190 $n (A \cap B) = 95, n (A' \cap B')$ Now, $n (A \cap B) = n (A \cup B)$ $n (A \cap B) = n (A $	Answork
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$\begin{array}{l} \textbf{LULY 2021} \\ \hline \textbf{Question 1} \\ \textbf{Let U be the universal set, A and B are the subsets of U. If n (U) = 650, n (A) = 310, n (A \cap B) = 95 and n (B) = 190, then n (\overline{A} \cap \overline{B}) is equal to (\overline{A} and \overline{B} are the complete of A and B) respectively. (a) 400 (b) 300 (c) 200 (d) 245 \\ \hline \textbf{Answer: Options (d)} \\ \hline \textbf{Explanation:} \\ \textbf{Let} \\ n (U) = 650, n(A) = 310, n(A \cap B) = 95, n(B) = 190 \\ n (A \cap B) = 95, n(A' \cap B') \\ \hline \textbf{Now,} \\ n (A \cap B) = n (A \cup B) \\ = n (U) - n (A \cup B) \\ \hline \textbf{For more Info Visit - www.KITest.in} \\ \hline \textbf{Tabular}$	f(4) = 2(4) = 8
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 $= n (U) - \{n (A) + n (B) + n(A \cap B)\}$ $= 650 - \{310 + 190 - 95\}\}$ = 245**Question 2** The range of function f defined by f (x) = $\sqrt{16 - x^2}$ is (b) [-4,4] (a) [-4,0] (c) [0,4] (d)(-4.4)**Answer: Options (c) Explanation**: Since square root can only take positive value so $-4 \le x \le 4 \Rightarrow \sqrt{16 - x^2 \epsilon} [0,4]$ Hence, option 'C' is correct. **Ouestion 3** Let A = R - {3} and B = R - {1}. Let f A \rightarrow B defined by f (x) = $\frac{x-2}{x-3}$ what is value of $f^{-1}\left(\frac{1}{2}\right)$? (a) 2/3(b) 3/4 (c) 1 (d) -1 **Answer: Options (c)** A = R - 3, B = R - 1 $F(x) = \frac{x-2}{x-3}$ $f: A \rightarrow B$ is defined as Let, x, $y \in A$ such that f(x) = f(y) $\Rightarrow \frac{x-2}{x-3} = \frac{y-2}{y-3}$ \Rightarrow x - 2y - 3 = y - 2x - 3 \Rightarrow xy - 3x - 2y + 6 = xy - 3y - 2x + 6 \Rightarrow - 3x - 2y = -3y - 2x \Rightarrow 3x - 2x = 3y - 2y $\Rightarrow x = y$ \therefore f is one – one. **Ouestion 4** If $f(x) = x^2 - 1$ and g(x) = |2x + 3|, then $f_0g(3) - g_0f(-3) =$ (a) 71 (b) 61 (d) 51 (c) 41 **Answer: Options (b) DEC 2021 Question 1** Out of group of 20 teachers in a school, 10 teach mathematics, 9 teach Physics and 7 teach Chemistry. 4 teach Mathematics and Physics but none teach both mathematics and chemistry. How many teach chemistry and Physics; how many teach only Physics? (a) 2, 3 (b) 3, 2

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(c) 4, 6	(d) 6, 4
Answer: a Explanation: Let the number of teachers teaching both physics a	and chemistry be x
In the absence of information, it is safe to assume t	hat all the teachers teach at least one of the
subjects. Therefore,	
9-x-0-4-x+7-x-0-0+4+0+0+6= 20	
= 9-4+7+4+6-x+x-x = 20	
=x = 22 - 20 = 2	
Therefore, number of teachers teaching both physic	ics = 9 - 2 - 4 = 3
<u>Question 2</u> If a related to b if and only if the difference in a (a) Symmetic, reflextive but not transitive (c) transitive, reflexive but not symmetric	and b is an even integer. This relation is (b) symmetric, transitive but not reflexive (d) equivalence relation
Answer: d Explanation: 1. Check for Reflexivity:	
(a) A relation is reflexive if every element has a relation with itself.	
(b) In this question, the relation exists only if the difference between the elements is an even	
integer.	
(c) Take, for example, the number 2. Now, for this	relation to be a reflexive relation, this element 2
would have to have a relation with itself.	
(d) 2 - 2 = 0, which is an even integer.	
(e) Therefore, any element can have a relation with itself, and hence, this is a reflexive relation.	
2. Check for Symmetry:	
(a) A relation is symmetric if $(a, b) \in R = (b, a) \in R$.	
(b) Take two integers, 2 and 6.	
(c) Here, 2 6 = - 4, which is an even integer.	
(d) Also, 6 - 2 = 4, which is an even integer.	
(e) Therefore, (2, 6) \in R and (6, 2) \in R.	
(f) Therefore, this is a symmetric relation.	
3.Check for Transitivity:	
(a) A relation is transitive if (a, b) \in R, and (b, c) \in	$R = (a, c) \in R.$
(b) Take the values of a, b. and c to be 2, 6, and 10 respectively.	
(c) Now, a = 2; b = 6; C = 10	
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(d) Clearly, $(a, b) \in \mathbb{R}$ as 2 - 6 = -4, which IS an even integer. (e) Also, (b, c) \in R as 6 - 10 = -4, which iS an even integer. (f) Also, (a, c) \in R as 2 - 10 = -8, which is an even integer. (g) Therefore, this relation is a transitive relation. Since this relation is a Reflexive, Symmetric, as well as a Transitive Relation, it is an Equivalence Relation.

Question 3 If $u(x) = \frac{1}{1-x'}$ then u '(x) is: (a) (c) 1 -**Answer: Explanation**: Let y = u(x)Therefore, $y = \frac{1}{1-x}$ y(1 - x) = 1y - xy = 1y - 1 = xyxy = y - 1 $x = \frac{y-1}{y}$ Now, simply replace x with $u^{-1}(x)$, and y with x, and you'll get the answer

 $u^{-1}(x) = \frac{x-1}{x}$ $u^{-1}(x) = \frac{x}{x} - \frac{1}{x}$ $u^{-1}(x) = 1 - \frac{1}{x}$

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(b) 1-x

(d) $\frac{1}{r} - 1$

Question 1

 $f(x) = \{(2, 2); (3, 3); (4, 4); (5, 5); (6, 6)\}$ be a relation of set A = $\{2,3,4,5,6\}$ It is a: (a) Reflexive and Transitive (b) Reflexive and Symmetric (c) Reflexive only (d) An equivalence

Answer: Options (c) Explanation:

If $f(x) = \{(2,2), (3,3), (4,4), (5,5), (6,6)\}$ be the Relation of $A = \{2, 3, 4, 5, 6\}$ It is a Reflexive only.

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Ouestion 2 If $f(y) = \frac{y-1}{y}$, find $f^{1}(x)$. (a) $\frac{1}{\frac{1-y}{y}}$ (c) $\frac{y}{y-1}$ (b) y (d) $\frac{y}{1-y}$ **Answer: Options (a) Explanation**: Given $f(y) = \frac{y-1}{y}$ Let $f(y) = x \Rightarrow y = f^{-1}(x)$ $x = \frac{y-1}{y}$ xy = y - 1xy - y = -1y((x-1) = -1 $y = \frac{-1}{(x-1)}$ $f^{-1}(x) = \frac{1}{(x-1)}$ $f^{-1}(y) = \frac{-1}{(y-1)} = \frac{1}{1-y}$ **Ouestion 3** Two finite sets have x and y number of elements. The total number of subsets of first is 56 more than the total number of subsets of second. The value of x and y is: (a) 6 and 3 (b) 4 and 2 (c) 2 and 4 (d) 3 and 4 **Answer: Options (a) Explanation:** Let set $A = \{1, 2, 3, ..., x\}$ No. of subsets of $A = 2^x$ and Ste B = {1,2,3y} No. of subset of $B = 2^y$ Given, $2^x = 2^y + 56$ (1) Hits & x = 6, y = 3 is satisfied this equation, So x = 6 and y = 3. **Ouestion 4** Given A = $\{2,3\}$, B = $\{4,5\}$, C = $\{5,6\}$ then A × (B ∩ C) is: (a) {(2,5), (3,5)} (b) {(5,2), (5,3)} (c) {(2,3), (5,5)} (d) None of these **Answer: Options (a) Explanation**: $A = \{2,3\}, B = \{4,5\}, C = \{5,6\}$ $B \cap C = \{5\}$ $A \times (B \cap C) = \{2,3\} \times \{5\}$ $= \{(2,5), (3,5)\}$

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Question 5	
If the universal set E = {x : x is a positive integer < 25}, A = {2, 6, 8, 14, 22}, B = {4, 8, 10, 14}	ł} —
(a) $(A \cap B)' = A' \cup B'$ (b) $(A \cap B)' = A' \cap B'$	
(c) $(A \cap B)' = \varphi$ (d) None of these	
Anguan Ontions (a)	
Answer: Options (a)	
Explanation:	
If $E = \{x : x \text{ is a positive Integers } < 25\}$	
$A = \{2, 6, 8, 14, 22\}$	
$B = \{4, 8, 10, 14\}$	
then $(A \cap B)' = A' \cup B'$ [Demorgan Law]	
: Demorgan law is universal truth.	
DEC 2022	
Question 1	
If $A = \{1, \overline{2}, 3, \overline{4}, 5, \overline{7}, 8, \overline{9}\}$ and $\{2, 4, 6, 7, 9\}$ then how many proper subset of $A \cap B$ can be	
created	
a) 16 b) 15	
c) 32 d) 31	
Answer: Options (b)	
Explanation:	
Given:	
$A = \{1, 2, 3, 4, 5, 7, 8, 9\}$ and $B = \{2, 4, 6, 7, 9\}$	
As we know that A n B = $\{x : x \in A \text{ and } x \in B\}$	
$A \cap B = \{2, 4, 7, 9\}$	
As we can see that,	
The number of elements present in $A \cap B = 4$	
i.e $n(A \cap B) = 4$	
As we know that;	
If A is a non-empty set such that $n(A) = m$ then	
The numbers of proper subsets of A are given by $2^m - 1$.	
So, The number of proper subsets of A n B = 24 - 1 = 15	
Hence, the correct option is 2	
Ouestion 2	
Let A = $\{1, 2, 3\}$ and consider the relation R = $\{(1, 1), (2, 2), (3, 3), (1, 2), (2, 3), (1, 3), Then$	R
is:	
a) symmetric and transitive b) reflexive but not transitive	
c) reflexive but not symmetric d) neither symmetric, nor transitive	
af herener symmetrie	
Answer: Options (c)	
Explanation:	
Let A = (1, 2, 3}and consider the relation R = (1, 1), (Z 2), (3, 3), (1, 2), (2, 3), (1,3)). Then R is	
reflexive but not symmetric.	
Explanation:	
Given that $A = \{1, 2, 3\}$	
R = ((1, 1), (2, 2), (3, 3), (1, 2), (2, 3)A1, 3))	
$v (1, 1), (2, 2)A3, 3) \in \mathbb{R}$	
Hence, R is reflexive.	

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 $(1, 2) \in \mathbb{R}$ but $(2, 1) \nexists \mathbb{R}$ Hence, R is not symmetric. $(1, 2) \in \mathbb{R}$ and $(2, 3) \in \mathbb{R}$ →(1,3)ER Hence, R is transitive.

Question 3

 The number of subsets of the set {0, 1, 2, 3} is

 a) 2
 b) 4

 c) 8
 d) 16

Answer: Options (c)

Explanation: A subset is a part of the set. Given, set = $\{1, 2, 3\}$ We have to find the total number of subsets. A set with 'n' elements in it can have 2n subsets. So, total number of subset = $2^3 = 8$ The possible subsets are: $\{1\}, \{2\}, \{3\}, \{1, 2\}, \{1, 3\}, \{2, 3\}, \{1, 2, 3\} \text{ and } \{\}$ Where, $\{\}$ is the empty set. Therefore, the number of subsets is 8.

Question 4

In a given set if all data are of same value then variance would be:

a) 0	b) 1
c) -1	d) 0.5

Answer: Options (a)

Explanation:

Variance is the degree of spread or change in the given data points. The <u>variance</u> is calculated in relation to the mean of the data. The more the spread of the data, the more will be the variance in relation to the <u>mean</u>.

The formula for variance: $\sigma^2 = \sum (X - \mu)^2 / N$, σ^2 = sample variance X = each data value μ = mean of the data set N = total number of data set Special case: When all the data set points are the same. In this case, the <u>mean of the data set i.e.</u> μ is the same as each data value i.e. X.

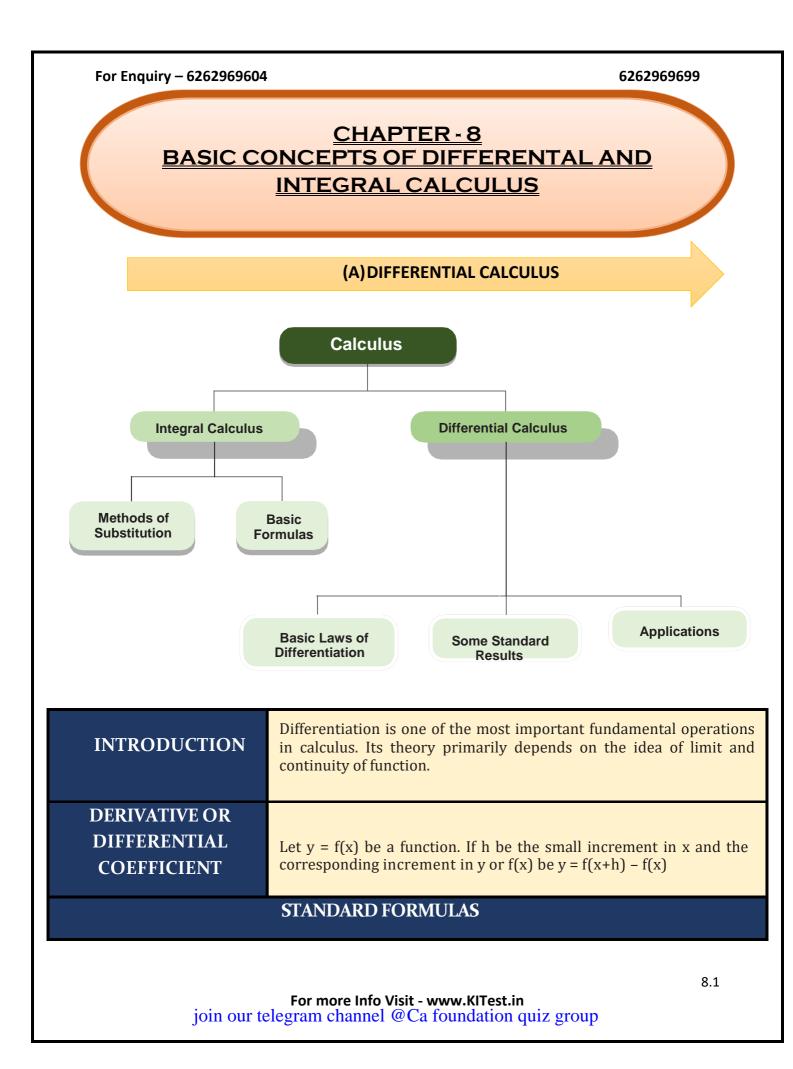
So, X = μ.

Thus, X - μ = 0 Hence, variance becomes 0.

In order to calculate the variance of the given data set, we can make use of the <u>online variance</u> <u>calculator</u>.

So, the variance of the data set in which each value is similar will be equal to 0.

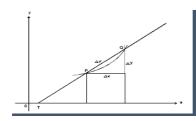
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$\frac{d}{dx}(a) = 0$ $\frac{d}{dx}(a) = 0$ $\frac{d}{dx}(x) = 1$ $\frac{d}{dx}(ax) = a\frac{dx}{dx}$ $\frac{d}{dx}(ax) = a\frac{dx}{dx}$ $\frac{d}{dx}(x+v-w) = \frac{d}{dx}(xv) = x\frac{dv}{dx}$ $\frac{d}{dx}(xv) = x\frac{dv}{dx}$ $\frac{d}{dx}(x^{n}) = nux^{n-1}$ $\frac{d}{dx}(\sqrt{u}) = \frac{1}{2\sqrt{u}}$ $\frac{d}{dx}(\sqrt{u}) = \frac{1}{2\sqrt{u}}$ $\frac{d}{dx}(\frac{1}{u}) = -\frac{1}{u^{2}}$ $\frac{d}{dx}(\frac{1}{u^{5}}) = -\frac{v}{u^{5}}$ $\frac{d}{dx}[f(u)] = \frac{d}{du}$	$= \frac{du}{dx} + \frac{dv}{dx} - \frac{dw}{dx} \qquad \qquad$	
IMPLICIT FUNCTIONS	A function in the form $f(x, y) = 0$. For example, $x^2y^2 + 3xy + y = 0$ where y cannot be directly defined as a function of x is called an implicit function of x.	
PARAMETRIC EQUATION	When both the variables x and y are expressed in terms of a parameter (a third variable), the involved equations are called parametric equations. For the parametric equations $x = f(t)$ and $y = h(t)$ the differential coefficient $\frac{dy}{dx}$	
LOGARITHMIC DIFFERENTIATION	The process of finding out derivative by taking logarithm in the first instance is called logarithmic differentiation.	

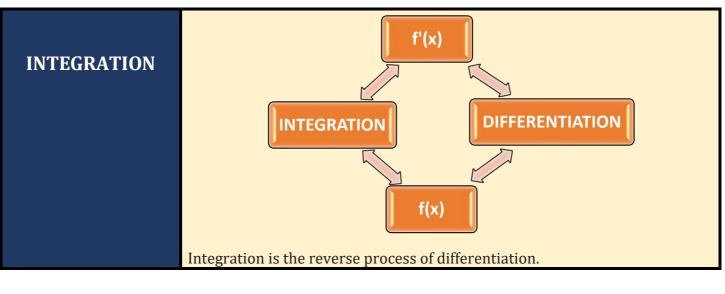
GEOMETRIC INTERPRETATION OF THE DERIVATIVE



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COST FUNCTION	NCTION Total cost consists of two parts (i) Variable Cost (ii) Fixed Cost.		
	Average cost (AC or _C)	$\frac{Total Cost C(X)}{Output \overline{X}}$	
	Average variable cost (AVC)	$\frac{Variable\ Cost\ V(X)}{Output\ \bar{X}}$	
	Average Fixed Cost (AFC)	$\frac{Fixed \ Cost \ F(X)}{Output \ \bar{X}}$	
MARGINAL COST	If C(x) the total cost producing x units then the increase in cost in producing one more unit is called marginal cost at an output level of x units		
REVENUE FUNCTION	Revenue, R(x), gives the total money obtained (Total turnover) by selling units of a product. If x units are sold at P per unit, then R(x)=P.X		
PROFIT FUNCTION	Profit P(x), the difference of between total revenue R(x) and total Cost C (x).		

(B) INTEGRAL CALCULUS



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DEFINITE INTEGRATION

DEFINITION The collection of all antiderivatives of f is called the **indefinite integral** of f with respect to x, and is denoted by

$$\int f(x) dx.$$

The symbol \int is an integral sign. The function f is the integrand of the integral, and x is the variable of integration.

Differentiation Formulas:

1.
$$\frac{d}{dx}(x) = 1$$

2.
$$\frac{d}{dx}(ax) = a$$

3.
$$\frac{d}{dx}(x^n) = nx^{n-1}$$

4.
$$\frac{d}{dx}(\cos x) = -\sin x$$

5.
$$\frac{d}{dx}(\sin x) = \cos x$$

6.
$$\frac{d}{dx}(\tan x) = \sec^2 x$$

7.
$$\frac{d}{dx}(\cot x) = -\csc^2 x$$

8.
$$\frac{d}{dx}(\sec x) = \sec x \tan x$$

9.
$$\frac{d}{dx}(\csc x) = -\csc x(\cot x)$$

10.
$$\frac{d}{dx}(\ln x) = \frac{1}{x}$$

11.
$$\frac{d}{dx}(e^x) = e^x$$

12.
$$\frac{d}{dx}(a^x) = (\ln a)a^x$$

13. $\frac{d}{dx}(\sin^{-1}x) = \frac{1}{\sqrt{1-x^2}}$

14. $\frac{d}{dx}(\tan^{-1}x) = \frac{1}{1+x^2}$

15. $\frac{d}{dx}(\sec^{-1}x) = \frac{1}{|x|\sqrt{x^2 - 1}}$

Integration Formulas:

1.
$$\int 1 dx = x + C$$

2.
$$\int a \, dx = ax + C$$

3.
$$\int x^n dx = \frac{x^{n+1}}{n+1} + C, n \neq -1$$

4.
$$\int \sin x \, dx = -\cos x + C$$

5.
$$\int \cos x \, dx = \sin x + C$$

6.
$$\int \sec^2 x \, dx = \tan x + C$$

7.
$$\int \csc^2 x \, dx = -\cot x + C$$

8.
$$\int \sec x (\tan x) \, dx = \sec x + C$$

9.
$$\int \csc x (\cot x) \, dx = -\csc x + C$$

10.
$$\int \frac{1}{x} dx = \ln |x| + C$$

11.
$$\int e^x dx = \frac{a^x}{\ln a} + C \, a > 0, a \neq 1$$

13.
$$\int \frac{1}{\sqrt{1-x^2}} dx = \sin^{-1} x + C$$

14.
$$\int \frac{1}{1+x^2} dx = \tan^{-1} x + C$$

15.
$$\int \frac{1}{|x|\sqrt{x^2-1}} dx = \sec^{-1} x + C$$

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Properties of Definite Integral

Assuming f and g are continuous functions

$$\int_{a}^{b} f(x)dx = \int_{b}^{a} f(x)dx$$

$$\int_{a}^{a} f(x)dx = 0$$

$$\int_{a}^{b} cdx = c(b-a), \text{ where c is any constant}$$

$$\int_{a}^{b} cf(x)dx = c\int_{a}^{b} f(x)dx, \text{ where c is any constant}$$

$$\int_{a}^{b} [f(x) + g(x)]dx = \int_{a}^{b} f(x)dx + \int_{a}^{b} g(x)dx$$

$$\int_{a}^{b} [f(x) - g(x)]dx = \int_{a}^{b} f(x)dx - \int_{a}^{b} g(x)dx$$

$$\int_{a}^{b} f(x)dx + \int_{b}^{c} f(x)dx = \int_{a}^{c} f(x)dx$$



Question 1

Find an expression for y given $\frac{dy}{dx} = 7x^5$ (a) 6 (b) 2 (c) 3 (d) 5 Answer: a Explanation: $\frac{dy}{dx} = 7x^5 \rightarrow dy = 7x^5 dx$ Integrating both sides, we have $\int dy = \int 7x^5 dx \rightarrow y = \frac{7x^6}{6} + c$

Question 2

Find an expression for y given $\frac{dy}{dx} = x^{-\frac{3}{4}}$ (a) $\frac{2}{3}$ (c) $\frac{5}{4}$

(b) $\frac{1}{4}$ (d) None

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Answer: b Explanation: $\frac{dy}{dx} = x^{-3/4}$ $Y = \frac{x^{-3/4+1}}{\frac{-3}{4}+1} = \frac{x^{1/4}}{\frac{1}{4}}$ $Y = 4x^{1/4}$

Question 3 dy = $\int -12x^{-4} dx$ solve it; (a) 6 (b) 2 (c) 3 (d) 4 Answer: d Explanation: dy = $\int -12x^{-4} dx$ = $-12 \int x^{-4} dx$ Use $\int ax^n dx = a \int x^n dx = \frac{ax^{n+1}}{n+1} + c$ = $+(\frac{-12x^{-3}}{-3}) + c$ n = -4, n + 1 = -4 + 1 = -3Y = $4x^{-3} + c$ Simplifying fraction, $\frac{-12}{3} = 4$

Question 4 Given f '(x) = $\frac{1}{2}x^{\frac{1}{3}} - \frac{1}{4}x^{\frac{1}{4}} + \pi$, find f (x) (a) 6 (c) 3

(b) 2 (d) None

 $\frac{1}{2}x^{\frac{1}{3}} - \frac{1}{4}x^{\frac{1}{4}} + \pi$ $\int \frac{1}{2}x^{\frac{1}{3}} dx - \int \frac{1}{4}x^{\frac{1}{4}} dx + \int \pi dx$ $\frac{1}{2}\int x^{\frac{1}{3}} dx - \frac{1}{4}\int x^{\frac{1}{4}} dx + \pi \int dx$ $= \frac{\frac{1}{2}x^{\frac{4}{3}}}{\frac{4}{3}} - \frac{\frac{1}{4}x^{\frac{5}{4}}}{\frac{5}{4}} + \frac{\pi x}{2} + c$ $= \frac{3x^{\frac{4}{3}}}{8} - \frac{1}{4} \times \frac{4}{5}x^{\frac{5}{4}} + \pi x + c$

Question 5

Answer: d Explanation:

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Given f'(x) =
$$\int \left(\frac{2}{x} + \frac{3}{x^2} + \frac{1}{x^5}\right) dx$$

(a) -6
(c) -4

Answer: c Explanation:

$\int \left\{ \frac{2}{x} + \frac{3}{x^2} + \frac{1}{x^5} \right\} dx$	
$=\int \left(\frac{2}{x} + 3x^{-2} + x^{-5}\right) dx$	write as negative exponence
$=\int \frac{2}{x} dx + \int 3x^{-2} dx + \int x^{-5} dx$	Use $\int f(x)dx + g(x)dx = \int f(x)dx + \int g(x)dx$
$= 2 \ln x + \frac{3x^{-1}}{-1} + \frac{x^{-4}}{-4} + c$	Use $\int ax^n dx = a \int x^n dx = \frac{ax^{n+1}}{n+1} + c$
$= 2 \ln x - \frac{3}{x} - \frac{1}{4x^4} + c$	Simplify $\frac{3}{-1}$

(b) 2

(d) None

<u>Question 6</u> Integrate $\int_{-3}^{3} dt$

Integrate $\int \frac{1}{x^2} dx$	
(a) $6\sqrt{x+c}^{-1}$	(b) $\sqrt{x+c}$
(c) $8\sqrt{x+c}$	(d) $9\sqrt{x+c}$

Answer: a Explanation:

$$\int \frac{3}{x^{\frac{1}{2}}} dx = \int 3x^{-1/2}$$
$$= \frac{3x^{-1/2+1}}{-\frac{1}{2}+1} + c$$
$$= \frac{3x^{\frac{1}{2}}}{\frac{1}{2}} + c$$
$$= 6x^{\frac{1}{2}} + c$$
$$= 6\sqrt{x} + c$$

 Question 7

 Find y as a function of x if $\frac{d^2y}{dx^2} = 2x$ when x = 2, y = 7

 (a) $y = \frac{x^3}{3} + c$ (b) $y = \frac{x^2}{3} + c$

 (c) $y = \frac{x}{3} + c$ (d) None

Answer: a

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Explanation: $\int 2x dx = 2 \int x dx$ $=\left(\frac{2x^{1+1}}{1+1}\right) + C$ Use $\int ax^n dx = a \int x^n dx = \frac{ax^{n+1}}{n+1} + c$ $\frac{\mathrm{d}y}{\mathrm{d}x} = x^2 + c$ Multiply of fraction/simplify Finding $y = \int \frac{dy}{dx} = \int x^2 dx$ $Y = \frac{x^3}{3} + c$ Use $\int x^{n} dx = \frac{1}{n+1}x^{n-2} + c$ At (2, 7) 7 = $\frac{2^3}{3}$ + c Substituting x = 2 and y = 7 to find c $C = \frac{21}{2}$ Thus, the function is $y = \frac{x^3}{3} + c$. **Question 8** Integrate $\int \left(w + \frac{1}{w}\right) \left(w - \frac{1}{w}\right) dx$ $(a)\frac{w^3}{2} + \frac{1}{w}$ (b) $\frac{w^3}{2} + \frac{1}{w} + c$ $(c)\frac{w}{2} + \frac{1}{w} + c$ (d) None **Answer: b Explanation**: $\int (w + \frac{1}{w})(w - \frac{1}{w}) dw$ $=\int \left(w^2 - \frac{1}{w^2}\right) dw$ Express the product as a difference of two squares $=\int w^2 dw - \int \frac{1}{w^2} dw$ Use $\int f(x)dx + g(x)dx = \int f(x)dx + \int g(x)dx$ $=\int w^2 dw - \int w^2 w^{-2} dw$ Express in negative exponential form

Use $\int x^n dx = \frac{1}{n+1}x^{n-1} + c$. Simplify

(b) $10x - \frac{3}{2} + c$

(d) none

Question 9 If $\frac{d^2y}{dx^2} = 10 - 3x$, find $\frac{dy}{dx} + c$ (a) $10x - \frac{3}{2}x^2 + c$ (c) $10 - \frac{3}{2}x^2 + c$

 $=\frac{w^3}{2}+\frac{1}{w}+c$

Answer: a Explanation: $\frac{dy}{dx} = \int (10 - 3x) dx = \int 10 dx - \int 3x dx$ $= 10x - \left(\frac{3x^{1+1}}{1+1}\right) + c$

Use $\int f(x)dx + g(x)dx = \int f(x)dx + \int g(x)dx$ Use $\int ax^n dx = a \int x^n dx = \frac{ax^{n+1}}{n+1} + c$

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= $10x - \left(\frac{3x^2}{2}\right) + c$ = $10x - \frac{3}{2}x^2 + c$

Question 10 Calculate $\int x^7 dx$ (a) $\frac{1}{8}x^7$ +c

 $(c)\frac{1}{8}x^8 + c$

(d) None

(d) logx

(b) $\frac{2}{3}$

(b) $\frac{1}{7}x^7 + c$

Simplify

Answer: c Explanation:

$$\int x^{7} dx = \frac{1}{7+1} x^{7+1} + c$$
Use $\int x^{n} dx = \frac{1}{n+1} x^{7+1} + c$ and substitute n = 7
$$= \frac{1}{8} x^{8} + c$$

Question 11

If $\int f(x)dx = xe^{-\log|x|} + f(x)$, then f(x) is (a) 1 (b) 0

(c) ce^x

Answer: c Explanation:

 $\int f(x)dx = xe^{\log\left|\frac{1}{x}\right|} + f(x) \rightarrow \int f(x)dx = \frac{x}{|x|} + f(x)$ On differentiating both sides, we get $F(x) = 0 + f'(x) \qquad \text{we know}$ $\frac{d}{dx}(e^{x}) = e^{x}, \therefore f(x) = ce^{x}$

Question 12 If f (t) = $\int_{-t}^{t} \frac{dx}{1+x^2}$, then f' (1) is (a) 0

(c) -1 (d) 1

Answer: d Explanation: Given $f(t) - \int_{-t}^{t} \frac{dx}{1+x^2} = [\tan^{-1}x]_{-t}^{t} = 2 \tan^{-1}t$ Differentiating with respect to $f'(t) = \frac{2}{1+t^2}$

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 $f'(1) = \frac{2}{2} = 1$

Question 13The existence of first order partial derivatives implies continuity(a) True(b) False

(c) Not sure

(d) Invalid Question

Answer: b

Explanation:

The mere existence cannot be declared as a condition for continuity because the second order derivates should also be continuous.

Question 14

Eight guests have to be seated 4 on each side of a long rectangular table. 2 particular guests desire to sit on one side of the table and 3 on the other side. The number of ways in which the sitting arrangements can be made is:

(a) 1732 (b) 1728

(c) 1730 (d) 1278

Answer: b

Explanation:

Let the two particular guests sit on right side. So the three particular guests will sit on left side. So remaining will be 3 people which need to be selected. From these 3 people 2 will sit on right side and the one will sit on left side. Total ways of arranging the people will be = $3_{c_2} \times 1_{c_1} = 3$ Total ways of arranging the people will be = Selection of remaining × 4! (For arranging people on left side) × 4! (Arranging people on right side) = $3 \times 24 \times 24 = 3 \times 756 = 1728$ So in 1728 ways we can arrange them

Question 15 If f(x) = x^k and f '(1) = 10, then the value of k is (a) 10 (b) -10

(c) $\frac{1}{10}$ (d) None

Answer: a

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Explanation: $F(x) = x^k$ $F(1) = f(1) = k \times 1$ $10 = k \times 1$ K = 10

Question 16

The points of discontinuity of the function, $f(x) = \frac{x^2+2x+5}{x^2-3x+2}$ are (a) x=0, x=1 (b) x=1, x=2

(c) x=0, x=2

(d) None

Answer: b

Explanation: $f(x) = \frac{x^2+2x+5}{x^2-3x+2}$ Denominator = 0 $X^2 - 3x + 2 = 0$ (x-1)(x-2) = 0X = 1, x = 2

Question 17

The gradient of a function is parallel to the velocity vector of the level curve(a) True(b) False

(c) Not sure

(d) Invalid questions

Answer: b

Explanation:

The gradient is perpendicular and not parallel to the velocity vector of the level curve.

$\frac{\text{Question 18}}{\text{y} = (8 + x^3) (x^3 - 8)}$	
(a) $6x^5$	(b) <i>x</i> ⁵
(c) 6x	(d) None

Answer: a Explanation:

This problem is solvable as a product but if you realize that you are looking at a difference of two squares, it because very simple. $Y = (8 + x^3) (x^3 - 8) = x^6 - 64$

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 $\frac{dy}{dx} = 6x^5$

Question 19

If (x, y, z, t) = xy + zt + x² y z t; x = k³; y = k²; z = k; t = \sqrt{k} Find $\frac{df}{dt}$ at k = 1 (a) 34 (b) 16

(c) 32

(d) 61

Answer: b

Explanation: Using chain rule we have $\frac{df}{dt} = f_x \frac{dx}{dk} f_y \frac{dy}{dk} + f_z \frac{dz}{dk} + f_t \frac{dt}{dk}$ $= (y + 2xy zt).(3k^2) + (x + x^2zt). (2k) + (t + x^2yt).(1) + (z + x^2yz).(\frac{1}{2\sqrt{k}})$ Put k = 1; we have x=y=z=t=1 9 + 4 + 2 + 1 = 16.

Question 20

If $(x, y) = x^2 + y^3$; $x = t^2 + t^3$; $y = t^3 + t^9$ find $\frac{df}{dt}$ at t=1. (a) 0 (b) 1 (c) -1 (d) 164 Answer: d Explanation: Using chain rule we have $\frac{df}{dt} = f_x \frac{dx}{dt} + f_y \frac{dy}{dt}$ $x = (2x). (2t + 3t^2) + (3y^2).(3t^2 + 9t^8)$ Put t = 1; we have x = 2; y = 2 = 4.(5) + 12.(12) = 164.

Question 21

 $f(x, y) = x^2 + xyz + z$ find f_x at (1, 1, 1)

(a) 0 (c) 3 Answer: c Explanation: F_x= 2x + yz Put (x, y,z) = (1, 1, 1) F_x = 2 + 1 = 3. **(b)** 1

(d) -1

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Question 22 Necessary condition of Euler's theorem is (a) z should be homogenous and of order (b) x should not homogeneous but for order n (d) should be the function of x and y only (c) Should be implicit Answer: a **Explanation**: Of x and y of order 'n' then $x \frac{dz}{dx} + y \frac{dz}{dy} = nz''$ Answer 'b' is incorrect as z should be homogeneous. Answer 'c' is incorrect as z should not be implicit. Answer 'd' is incorrect as z should be the homogeneous function of x and y not nonhomogeneous functions. **Ouestion 23** If $f(x, y) = \frac{x+y}{y}$, $x\frac{dx}{dz} + y\frac{dz}{dy} = ?$ (b) 1 (a) 0 (c) 2 (d) 3 Answer: a **Explanation**: Given function f (x, y) = $\frac{x+y}{y}$ can be written as f(x, y) = $\frac{\left|1+\frac{y}{x}\right|}{\frac{y}{2}}$ = x ° f $\left(\frac{y}{x}\right)$, Hence by Euler's theorem. $x\frac{dz}{dx} + y\frac{dz}{dy} = 0$ **Ouestion 24** Find the approximate value of $[0.982 + 2.012 + 1.942]^{1/2}$ (a) 1.96 (b) 2.96 (c) 0.04(d) -0.04 **Answer: b Explanation**: Let $f(x, y, z) = (x^2 + y^2 + z^2) \left(\frac{1}{2}\right)$ (1) Hence, x = 1, y = 2, z = 2, so that dx = -0.02, dy = 0.01, dz = -0.06From (1) $\frac{df}{dx} = \frac{x}{f}$ $\frac{df}{dy} = \frac{y}{f}$ $\frac{df}{dz} = \frac{z}{f}$

 $df = \frac{df}{dx}dx + \frac{df}{dy}dy + \frac{df}{dx}dz = \frac{(xdx+ydy+zdz)}{f} = \frac{-0.02+0.01-0.12}{3} = -0.04$ [0.98² + 2.01² + 1.94²]^{1/2} = f (1, 2, 2) + df = 3 - 0.04 = 2.96

Question 25

 $f(x,y) = \frac{x^3 + y^3}{x^{99} + y^{98}x + y^{99}}$ find the value of f_y at (x, y) = (0, 1) (a) 101 (b) -96 (c) 210 (d) 0

Answer: b Explanation: Using Euler theorem $Xf_x + yf_y = n f(x, y)$ Substituting x = 0; n = -96 and y = 1 we have $F_y = -96$. F (0, 1) = -96.(1 / 1) = -96

Question 26

$f(x, y) = x^3 + xy^2 + 901$ satisfies the Eulers theorem		
(a) True	(b) False	
(c) Not sure	(d) Invalid questions	
Answer: b		
Explanation:		
The function is not homogenous and l	hence does not satisfy the condition posed by Euler's	
theorem.		

Question 27

For a homogenous function if critical points exist the value at critical points is		
(a) 1	(b) equal to its degree	
(c) 0	(d) -1	
Answer: c		
For a homogeneous function if	critical points exist the value at critical points is? f(a, b	

For a homogeneous function if critical points exist the value at critical points is? $f(a, b) = 0(a, b) \rightarrow critical points$. nf $(a, b) = 0 \Rightarrow f(a, b) = 0(a, b) \rightarrow critical points$. Explanation: Euler's theorem is nothing but the linear combination asked here, The degree of the homogeneous function can be a real number.

Question 28

 $\frac{\lim_{n \to \infty} \left[\frac{n}{1+n^2} + \frac{n}{4+n^2} + \frac{n}{9+n^2} + \dots + \frac{1}{2n}\right] \text{ is equal to}}{(a)\frac{\pi}{2}}$ (c) 1
(d) None of these

Answer: d Explanation:

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We have
$$\lim_{n \to \infty} \left[\frac{n}{1+n^2} + \frac{n}{4+n^2} + \dots + \frac{1}{2n} \right]$$

$$= \lim_{n \to \infty} \int_{r=1}^{n} \frac{n}{r^2+n^2} = \lim_{n \to \infty} \sum_{r=1}^{n} \frac{n}{n^2 \left(1 + \frac{r^2}{n^2}\right)}$$

$$= \lim_{n \to \infty} \sum_{r=1}^{n} \frac{1}{n \left(1 + \frac{r^2}{n^2}\right)} - \int_{0}^{1} \frac{dx}{1+x^2}$$

$$\left\{ \text{Applying formula,} \lim_{n \to \infty} \sum_{r=0}^{n-1} \left\{ f\left(\frac{r}{n}\right) \right\} \cdot \frac{1}{n} = \int_{0}^{1} f(x) dx \right\}$$

$$= [\tan^{-1}x]_{0}^{1} = \tan^{-1}1 - \tan^{-1}0 = \frac{\pi}{4}.$$

Question 29 For homogenous function with no saddle points we must have the minimum value as (a) 90 (b) 1

(c) Equal to degree (d) 0

Answer: d

Explanation: Substituting $f_x = f_y = 0$ At critical in euler's theorem we have $nf(a, b) = 0 \rightarrow f(a, b) = 0(a, b) \rightarrow critical points.$

Question 30

The derivates of $f(x) = \int_{x^2}^{x^3} \frac{1}{\log t} dt$, (x>0) is (a) $\frac{1}{3\log x} - \frac{1}{2\log x}$ (b) $\frac{1}{3\log x}$ (c) $\frac{3x^2}{3\log x}$ (d) $(\log x)^{-1} \cdot x (x - 1)$

Answer: d Explanation: We know that

$$\frac{d}{dx}\left(\int_{a}^{b} f(t)dt\right) = \frac{db}{dx}f(b) - \frac{da}{dx}f(a)$$

a and b are functions of x
$$F'(x) = \frac{d}{dx}(x^{3})\frac{1}{\log x^{3}} - \frac{d}{dx}(x^{2})\frac{1}{\log x^{2}}$$
$$= \frac{3x^{2}}{3\log x} - \frac{2x}{2\log x} = x(x-1)(\log x)^{-1}$$

$$f(x) = \int_{x^2}^{x^2} \frac{1}{\log t} dt$$

Question 31

The greatest value of the function $f(x) = \int_{1}^{x} |t| dt$ on the interval $\left[-\frac{1}{2}, \frac{1}{2}\right]$ is given by? (a) $\frac{3}{8}$ (b) $-\frac{1}{2}$ (c) $-\frac{3}{8}$ (d) $\frac{2}{5}$

Answer: c

Explanation: $f^d(\mathbf{x}) = |\mathbf{x}| > 0 \forall \mathbf{x} \in \left[-\frac{1}{2}, \frac{1}{2}\right]$ hence the Function is increasing on $\left[-\frac{1}{2},\frac{1}{2}\right]$ and therefore f(x) has Maximum at the right point of $\left[-\frac{1}{2},\frac{1}{2}\right]$ $_{\varrho} \operatorname{Max} f(x) = f\left(\frac{1}{2}\right) = \int_{1}^{\frac{1}{2}} |t| dt - \frac{3}{2}$

Ouestion 32

For homogenous function the linear combination of rates of independent change along x and y axis is (a) Integral multiple function value

(b) no relation to function value

(c) real multiple of function value

(d) depends if the function is a polynomial

Answer: c

Explanation:

Euler's theorem is nothing but the linear combination asked here, The degree of the homogeneous function can be a real number. Hence, the value is integral multiple of real number.

Question 33

 $\int_0^{b-c} f^n(\mathbf{x} + \mathbf{a}) \, \mathrm{d}\mathbf{x} =$ (a) f'(a) - f'(b)

(b) f'(b-c+a)-f'(a)

(c) f' (b+c-a) + f'(a)

(d) None of these

Answer: b Explanation: $\int_{0}^{b-c} f^{n}(x+a)dx$

 $= [f'(x + a)]_0^{b-c} = f'(b-c+a) - f'(a).$

Question 34

 $\int_0^x \frac{x^3 dx}{\left(x^2 + 4\right)^2} =$ (a) 0(c) 1/2

(b) ∞ (d) None of these

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Answer: b

Explanation: $\int_{0}^{\infty} \frac{x^{3} dx}{(x^{2}+4)^{2}} = \frac{1}{2} \int_{0}^{\infty} \frac{2x^{2} dx}{(x^{2}+4)^{2}} dx$ $= 2 \int_{0}^{\infty} \frac{t}{(t+4)^{2}} dt, \qquad \text{[Putting } x^{2} = t\text{]}$ $= 2 \int_{0}^{\infty} \left[\frac{1}{t+4} - \frac{4}{(t+4)^{2}}\right] dt = \frac{1}{2} \left[\log(t+4) + \frac{4}{t+4}\right]_{0}^{\infty}$ $= \frac{1}{2} [\log \infty + 0 - (\log 4 + 1)] = \infty$

Question 35

The points of intersection of F1(x) = $\int_2^x (2t - 5) dt$ and $f_2(x) = \int_0^x 2t dt$, are (a) $\left(\frac{6}{5}, \frac{36}{25}\right)$ (b) $\left(\frac{2}{3}, \frac{4}{5}\right)$ (c) $\left(\frac{1}{3}, \frac{3}{6}\right)$ (d) $\left(\frac{5}{4}, \frac{5}{7}\right)$

Answer: a

Explanation: Let $f_1(x) = y_1 = \int_2^x (2t - 5) dt$ and $F_2(X) = y_2 = \int_0^x 2t dt$ now point of intersection means whose those point at which $x^2 = x^2 - 5x + 6 => x = \frac{6}{5}$ and $y = x^2 = \frac{36}{25}$ thus point of Intersection is $\left(\frac{6}{5}, \frac{36}{25}\right)$

Question 36The solution of the equation $\frac{x^2 d^2 y}{dx^2} = \ln x$, when x=1, y=0 and $\frac{dy}{dx} = -1$ (a) $\frac{1}{2}(\ln t)^2 + \ln x$ (b) $\frac{1}{2}(\ln x)^2 - \ln x$

 $(c) - \frac{1}{2}(Inx)^2 + Inx$

 $(d) - \frac{1}{2}(\log x)^2 - \log x$

Answer: d Explanation: $\frac{d^2y}{dx^2} = \frac{\log x}{x^2} \xrightarrow{-(\log x+1)}{x} + c$ At $\frac{dy}{dx} = -\int \frac{\log x+1}{x} dx = -\frac{1}{2} (\log x)^2 - \log x$

Question 37The rate of increase of bacteria in a certain culture is proportional to the numberpresent. If it double 5 hours then in 25 hours its number would be(a) 8 times the original(b) 16 times the original(c) 32 times the original(d) 64 times the originalAnswer: c

Explanation:

Let P₀ be the initial population and let the Population after t years be P. then $\frac{dp}{dt} = KP \rightarrow \frac{dP}{P} = kdt$ On integrating, we have log P = kt + c At t = 0, P = P₀ \therefore log P₀ = 0 + C, \therefore log P = KT + log P₀. Log $\frac{p}{p_0} = kt$ when t = 5 hrs, P = 2P₀. Log $\frac{2P}{P_0} = 5K \circ K = \frac{LOG^2}{5} : \therefore \log \frac{p}{p_0} = \frac{\log^2}{5}t$ when T = 25 hours, we have Log $\frac{p}{p_0} = \frac{\log^2}{5} \times 25 = 5 \log 2 = \log 32; \therefore P = 32P_{0}.$

Question 38

The degree of the $3\frac{d^2y}{dx^2} = \left\{1 + \left(\frac{dy}{dx}\right)^2\right\}^{\frac{3}{2}}$ is differential equation (a) 1 (b) 2 (c) 3 (d) 6 Answer: b Explanation: $3\frac{d^2y}{dx^2} = \left\{1 + \left(\frac{dy}{dx}\right)^2\right\}^{\frac{3}{2}}$ on squaring, we Get $9\left(\frac{d^2y}{dx^2}\right)^2 = \left\{1 + \left(\frac{dy}{dx}\right)^2\right\}^3$ obviously the

Highest derivates $\frac{d^2y}{dx^2}$ contains a degree 2.

Question 39

The differential equation representing the family of curves $y^2 = 2c(x+\sqrt{c})$, where c is a positive perimeter, is of

(a) Order 1 (c) Degree 3 Answer: a Explanation: Given family of curves $y^2 = 2c(x+\sqrt{c}), \qquad \dots (i)$ On differentiating both sides, we get $2y\frac{dy}{dx} = 2c(1+0) \rightarrow c = y\frac{dy}{dx}$ From equation (i), we have $y^2 = 2y\frac{dy}{dx} \left\{ x + \left(y\frac{dy}{dx} \right)^{1/2} \right\}$ $\rightarrow \left(y^2 - 2xy\frac{dy}{dx} \right) = 2 \left(y\frac{dy}{dx} \right)^{3/2}$ (b) Order 2 (d) Degree 4

On squaring both sides, we get

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$$\left(y^2 - 2xy \frac{dy}{dx}\right)^2 = 4\left(y\frac{dy}{dx}\right)^3$$

So,

Order = 1 (order of a differential equation is the order of the highest derivative (also known as differential coefficient) present in the equation) Degree = 3 (The degree of differential equation is represented by the power of the highest order derivative in the given differential equation)

Ouestion 41

The order and degree of the differentiate equations $\left(1+3\frac{dy}{dx}\right)^{\frac{2}{3}}-4\left(\frac{d^{3}y}{dx^{3}}\right)$ are (a) $1, \frac{2}{3}$ (b) 3, 1 (d) 1, 2 (c) 3, 3

Answer: c

Explanation:

To check, order and degree, the given differential equation should be fees from radicals, hence taking cube on both sides,

 $\left(1+3.\frac{dy}{dx}\right)^2 = \left(4.\frac{d^3y}{dx^3}\right)^3$ Order = 3, degree = 3.

Ouestion 42

The solution of the differential equation $y - x\frac{dy}{dx} = a\left(y^2 + \frac{dy}{dx}\right)$ is

(a) y=c(x+a)(1+ay)

(b) y=c(x+a)(1-ay)

(c) y=c(x-a)(1+ay)

(d) None of these

Answer: b **Explanation:** $Y - x\frac{dy}{dx} = a\left(y^2 + \frac{dy}{dx}\right)$ $Y - ay^2 = (x+a)\frac{dy}{dx} \qquad \qquad \frac{dy}{y(1-ay)} = \frac{dx}{x+a}$ On integrating both sides, we get ρ Logy - log (1 - ay) = log(x + a) + log c $\frac{y}{(1-ay)} = c(x + a) \text{ or } c(x + a)(1 - ay) = y.$

Question 43 Compute the sum of 4 digit numbers which can be formed with four digit 1, 3, 5, 7 if each digit is used once in each engagement: (b) 106636 (a) 106646

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(c) 106666

(d) None of these

Answer: d

Explanation:

The number of arrangements of 4 different digits taken 4 at a time is given by $4_{p_4} = 4! = 24$. Al the four digit will occur equal number of times at each of the position, namely ones, tens, hundreds, thousands.

Thus, each digit will occur $\frac{24}{4}$ = 6 times in each of the position. The sum of digits in one's position will be 6 × (1+3+5+7) = 96. Similar is the case in ten's hundred's and thousand's places.

Therefore, the sum will be $96 + 96 \times 10 + 96 \times 100 = 106656$

PAST EXAMINATION QUESTIONS:

<u>MAY 2018</u>

Question 1 The value of $\int_{1}^{2} \frac{1-x}{1+x} dx$ is equal to: (a) $\log_{2}^{3} - 1$ (c) $\frac{1}{2} \log_{2}^{3}$ Answer: b Explanation: $\int_{1}^{2} \left(\frac{1-x}{1+x}\right) dx = \int_{1}^{2} \left(\frac{1}{1+x} - \frac{x}{1+x}\right) dx$ $\int_{1}^{-2} \frac{1}{1+x} dx - \int_{1}^{-2} \frac{x}{x+1} dx$ $\int_{1}^{2} \frac{1}{1+x} dx - \int_{1}^{-2} (\frac{1+x-1}{1-x}) dx$ $\int_{1}^{2} \frac{1}{(1+x)} dx - \int_{1}^{2} (\frac{1}{1+x}) dx$ $\int_{1}^{2} \frac{1}{1+x} dx - \int_{1}^{2} 1 \times dx + \int_{1}^{2} \frac{1}{1+x} dx$ $2 \int_{1}^{2} \frac{1}{1+x} - \int_{1}^{2} 1 dx$ $2[\log(1+x)]_{1}^{2} - [x]_{1}^{2}$ $2[\log(2+1) - \log(1+1) - [2-1]$ $2[\log_{3}^{3} - \log_{2}^{3}] - 1$

Question 2

 $\int_0^2 \frac{3\sqrt{x}}{\sqrt{x}}$ is equal to

(b) $2\log_{\frac{3}{2}} - 1$ (d) $\frac{1}{2}\log_{\frac{3}{2}} - 1$

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(a) $\frac{\sqrt[2]{2}}{\log e^3}$	(b) 0	
(c) $\frac{\log e^3}{\log e^3}$ (c) $\frac{2(3\sqrt{2}-1)}{\log e^3}$	(d) $\frac{3\sqrt{2}}{\sqrt{2}}$	
Answer: c	$\left(\mathbf{u} \right) \sqrt{2}$	
Explanation:		
$\int_0^2 \frac{3\sqrt{x}}{\sqrt{x}} \mathrm{d}x$		
Let $\sqrt{x} = t$		
Let $\sqrt{x} = t$ $\int_{0}^{2} 3^{\sqrt{x}} \cdot \frac{1}{\sqrt{x}} dx \frac{1}{2\sqrt{x}} dx = dt$		
$\frac{1}{\sqrt{x}}$ dx = 2dt		
$\frac{1}{\sqrt{x}} dx = 2dt$ $\frac{1}{\sqrt{x}} dx = 2dt$ $\frac{1}{\sqrt{x}} dx = 2dt$ $\frac{1}{\sqrt{x}} dx = 2dt$		
t 0 $\sqrt{2}$		
$\begin{bmatrix} t & 0 & \sqrt{2} \\ \int_0^{\sqrt{2}} 3^t . 2dt \\ \int_0^{\sqrt{2}} 3^t dt \\ 2\left[\frac{3^t}{\log 3}\right]_0^{\sqrt{2}} \\ 2\left[\frac{3^{\sqrt{2}}}{\log 3} - \frac{3^0}{\log 3}\right] \\ 2(3^{\sqrt{2}} - 3^0) \end{bmatrix}$		
$\int_0^{\infty} 3^2 dt$		
$2\left[\frac{3^{2}}{\log 3}\right]_{0}^{1}$		
$2\left[\frac{3^{\sqrt{2}}}{\sqrt{2}}-\frac{3^{0}}{\sqrt{2}}\right]$		
$\begin{bmatrix} log 3 & \log 3 \end{bmatrix}$ $2\left(3^{\sqrt{2}} - 3^{0}\right)$		
$log_e 3$		
Question 3		
The value of $\int_0^2 \frac{\sqrt{x}}{\sqrt{x}+\sqrt{2-x}} dx$ is:		
(a) 0	(b) 3	
(c) 2 Answer: d	(d) 1	
Answer: d Explanation:		
$\int_{0}^{2} \frac{\sqrt{x}}{\sqrt{x} + \sqrt{2-x}} \mathrm{dx} \dots $		
$\int_{0}^{2} \frac{\sqrt{x}}{\sqrt{x} + \sqrt{2 - x}} dx \dots \dots \dots (1)$ $I = \int_{0}^{2} \frac{\sqrt{0 + 2 - x}}{\sqrt{0 + 2 - x} + \sqrt{2 - (0 + 2 - x)}} dx$ $\left[\int_{a}^{b} f(x) dx = \int_{a}^{b} f(a + b - x) dx \right]$		
$\begin{bmatrix} b \\ f(x) dx - b \\ f(x) dx \end{bmatrix}$		
$\left[\int_{a}^{b} f(x) dx - \int_{a}^{b} f(d+b-x) dx\right]$		
$I = \int_{0}^{2} \frac{\sqrt{2-X}}{\sqrt{2-X} + \sqrt{X}} dx \dots (2)$ Apply (1) and (2) we get		
Apply (1) and (2) we get $\sqrt{2-x}$		
$2 I = \int_0^2 \left[\frac{\sqrt{x}}{\sqrt{x + \sqrt{2-x}}} + \frac{\sqrt{2-x}}{\sqrt{2-x + \sqrt{x}}} \right] dx$		
2 I = $\int_{0}^{2} \frac{(\sqrt{x} + \sqrt{2} - x)}{(\sqrt{x} + \sqrt{2} - x)} dx$		
$2 I = \int_0^2 1 dx$		
$2 I = [X]_0^2$		
		8.21

For Enquiry - 6262969604 6262969699 2I = [2 - 0]2 I = 2 $I = \frac{2}{2}$ I = 1**Ouestion 4** $lim x + x^2 + x^3 \dots + x^n - n$ $X \to 1$ x-1(b) $\frac{n(n+1)}{2}$ (a) n (c) (n + 1)(d) n(n+1)**Answer: b Explanation**: $\lim_{x \to x^2 + x^3 \dots + x^n - n} (:)$ $X \rightarrow 1$ x-1By L.H. Rule $= \lim_{x \to \infty} \frac{d/dx(x+x^2+x^3\pm\cdots+x^n-n)}{d/dx(x+x^2+x^3\pm\cdots+x^n-n)}$ $x \to 1$ d/dx(x-1) $= \lim_{x \to \infty} \frac{1+2x+3x^2+\dots+nx^{n-1}}{x^{n-1}} = 0$ $=\frac{x \to 1}{1 + 2 \times 1 + 3(i)^2 + \dots + n(1)^{n-1}}$ = 1 + 2 + 3 + ----- n $=\sum_{n=}^{\infty} \frac{n(n+1)}{2}$ **Question 5** The cost function for the production of x unit of a commodity is given by $C(x) = 2x^3 + 15x^2 + 36x + 36x$ 15 (a) 3 (b) 2 (d) 4 (c) 1 **Answer: a Explanation:** The cost function given by $C(x) = 2x^3 + 15x^2 + 36x + 15$ $\frac{d}{dx}c(x) = 6x^2 - 30x + 36\dots(1)$ C(x) = 0 $6x^2 - 30x + 36 = 00$ $6(x^2 - 5x + 6) = 0$ $= x^2 - 5x + 6 = 0$ $= x^2 - 3x - 2x + 6 = 0$ = x(x-3) - 2(x-3) = 0(x-3)(x-2) = 0X=3.2 Differentiating equations (2) again w.r.f. 'x'

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C(x) = 12x-30Eq (3) Putting (x = 2) in $C(x) = 12 \times 2 - 30 = -6$ Putting (x=3) in $C(x) = 12 \times 3-30 = 6(+ve)$ so function is minimum at x=3 **Question 6** $\lim_{x\to 0}\frac{2e_x^{\frac{1}{2}-3x}}{e^{\frac{1}{x}+x}}$ (a) -3 (b) 0(c) 2 (d) 9**Answer: C** Let $\frac{1}{x} = y$ if $x \rightarrow 0, y \rightarrow \infty$ $\lim_{x \to \infty} \frac{2e^y - 3\frac{1}{y}}{e^y + \frac{1}{y}}$ = lim $x \to \infty$ $= \frac{2-3\frac{1}{\infty.e^{\infty}}}{1+\frac{1}{\infty.e^{\infty}}}$ $= \frac{2-0}{1+0} = 2$ **NOV 2018 Question 1** Let x = at³, y= $\frac{a}{t^2}$ Then $\frac{dy}{dx}$ = (b) $\frac{-3a}{t^6}$ (a) $\frac{-1}{t^6}$ (c) $\frac{1}{3at^6}$ (d) None Answer: d **Explanation**: If x = at³, y = $\frac{a}{t^2}$ = at⁻² Given $x = at^3$ Different w.r.t. (t) $\frac{dy}{dx} = \frac{d}{dt} \operatorname{at}^3 = \operatorname{a.3t}^2 = \operatorname{3at}^2$ and y=at⁻² $\frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}} = \frac{-2at^{-3}}{3at^2} = \frac{-2}{3t^5}$

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Ouestion 2 $\int x(x^2+4)^5 dx$ is equal to (a) $(x^2 + 4)^6 + c$ $(c)\frac{1}{6}(x^2+4)^6+c$ **Answer: b Explanation:** $\int x(x^2+4)^5 = x$ Let $x^2 + 4 = t$ 2xdx = dt $Xdx = \frac{dt}{2}$ $\int (x^2 + 4)^5.xdx$ $\int t^5 \cdot \frac{dt}{2}$ $= \frac{1}{2} \int t^{5} dt$ $= \frac{1}{2} \frac{t^{6}}{6} + c$ $=\frac{1}{12}(x^2+4)^6+c$ **Question 3** $\overline{xy} = 1$ then $y^2 + \frac{dy}{dx} = ?$ (a) 1 (c) 2 **Answer: b Explanation**: Given : xy = 1To find: $y^2 + \frac{dy}{dx} = ?$ Xy = 1 $X = \frac{1}{y}$ Differentiate w.r.t x $1 = -\frac{1}{y^2} \cdot \frac{dy}{dx}$ (chain rule) $y^{2} = -\frac{dy}{dx}$ $y^{2} + \frac{dy}{dx} = 0$ Hence, the value of given differential equation is 0

Question 4 $\int_{-1}^{3} (1 + 3x + x^3) dx$ is equal to (b) $\frac{1}{12}(x^2 + 4)^6 + c$

(d) None

(b) 0

(d) None

For Enquiry – 6262969604		6262969699
(a) -4	(b) 4	
(c) 3	(d) -3	
Answer: a		
$\int_{-1}^{3} (1+3x+x^3) dx$		
$\int_{-1}^{3} 1 dx + \int_{-1}^{3} 3x dx - \int_{-1}^{3} x^{3} dx$		
$[x]_{-1}^{3} + 63\left[\frac{x^{2}}{2}\right]_{-1}^{3} - \left[\frac{x^{4}}{4}\right]_{-1}^{3}$		
$[3-(-1)] + \frac{3}{2}[(3)^2 - (-1)^2 - \frac{1}{4}[(3)^4 - (-1)^4]$		
$(3+1)+\frac{3}{2}[9-1]-\frac{1}{4}[81-1]$		
$4 + \frac{3}{2} \times 8 - \frac{1}{4} \times 80$		
4+12-20 = -4		
	<u>MAY 2019</u>	
Question 1 If $2^x - 2^y = 2^{x-y}$ then $\frac{dy}{dx}$ at $x = y = 2$		
(a) 1	(b) 2	
(c) 4	(d) 5	
Answer: a		
Explanation: $2^{x} - 2^{y} = 2^{x-y}$ $x = y = 2 \frac{dy}{dx}$		
2^{x} .Log ² – 2^{y} .log ² . $\frac{dy}{dx}$ = 2^{x-y} .Log ² $\left[1 - \frac{dy}{dx}\right]$		
$\operatorname{Log}^{2}[2^{x} - 2^{y} \frac{dy}{dx}] = \operatorname{Log}^{2}[2^{x-y}\left(1 - \frac{dy}{dx}\right)]$		
$2^{2} - 2^{2} \cdot \frac{dy}{dx} = 2^{0} \left[1 - \frac{dy}{dx} \right]$ $4 - 4 \cdot \frac{dy}{dx} = 1 - \frac{dy}{dx}$		
$4-4 \cdot \frac{dy}{dx} = 1 - \frac{dy}{dx}$ $4-1 = 4 \frac{dy}{dx} - \frac{dy}{dx}$		
$3 = 3\frac{dy}{dx}$		
$\frac{dy}{dx} = 1$		
	re Info Visit - www.KITest.in hannel @Ca foundation quiz group	8.25

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Question 2If the cost of function of a commodity is given by C = 150x-5x ² +stands for output. If the average cost is equal to the marginal c(a) 5(b) 10	U
(c) 15 (d) 20	
Answer: c Explanation: Average cost = $\frac{Totalcost}{output}$ C= 150x - 5x ² + $\frac{x^3}{6}$ $\frac{c}{output} = \frac{150x}{x} - \frac{5x^2}{x} \frac{\frac{x^3}{6}}{\frac{x}{6}}$ C = 150-5x+ $\frac{x^2}{6}$ $\frac{dc}{dx} = -5 + \frac{2x}{6}$ $-5 + \frac{x}{3} = 0$ 75+x = 0 X = 15	
Question 3 $\int_{2}^{3} \frac{\sqrt{x}}{\sqrt{5-x}+\sqrt{x}} dx =$ (a) 1 (b) $\frac{1}{2}$ (c) 2 (d) $\frac{3}{2}$ Answer: b Evaluation:	
Explanation: Let I = $\int_{2}^{3} \frac{\sqrt{x}}{\sqrt{5-x}+\sqrt{x}} dx$ (1) Using $\int_{a}^{b} f(x) dx = \int_{a}^{b} f(a+b-x) dx$ $\therefore I = \int_{2}^{3} \frac{\sqrt{5-x}}{\sqrt{5-(5-x)}+\sqrt{5-x}} dx$ (2) $I = \int_{2}^{3} \frac{\sqrt{5-x}}{\sqrt{x}+\sqrt{5-x}} dx$ Adding (1) and (2) $2I = \int_{2}^{3} \frac{\sqrt{x}+\sqrt{5-x}}{\sqrt{x}+\sqrt{5-x}} dx$ $= \int_{2}^{3} 1. dx$ $= [x]_{2}^{3}$ 2I = 3 - 2	
$2I = 3 - 2$ $I = \frac{1}{2}$	8.26

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$\frac{\text{Question 4}}{\int \log_{e}(a^{x})dx} =$ (a) $\log_{e}a\left[\frac{x^{2}}{2}\right]+c$

(c) $x \log_e a^x - x + c$

Answer: a

Explanation:

$$\int \log_{e} (a^{x}) dx$$
By option method: Base method
Differentiate option a

$$log_{e}a^{\left[\frac{x^{2}}{2}\right]}$$

$$\frac{1}{a\left|\frac{x^{2}}{2}\right|} \times a^{\left[\frac{x^{2}}{2}\right]} \cdot \log^{a} \cdot \times \frac{2x}{2}$$

$$= x.\log_{e}^{a}$$

$$= \log \frac{a^{x}}{e}$$

(b) $\log_e a^{\left[\frac{x}{2}\right]+c}$

(d) None of these

<u>NOV 2019</u>

(b) $1 + \log x$ (d) $\frac{a^x}{\log a} + c$

Question 1

 $\int a^{x} dx.$ $(a) x^{x} (1 + \log x)$ $(c) x. \log x$

Answer: d Explanation: (d) Since, we know that

$$\frac{d}{dx}\frac{a^x}{\log a} = a^x$$

$$\int a^x dx = \frac{a^x}{\log a} + c$$

Question 2

 $\int x \cdot e^{x} dx.$ (a) $e^{x} (1 + \log x)$ (c) $\log x + e^{x} + c$

Answer: b Explanation: Consider the given integral $I = \int xe^x dx$ (b) $xe^{x}-e^{x}+C$ (d) $\frac{x^{2}}{e^{x}}+c$

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We know that

 $\int uvdx = u \int vdx - \int \left(\frac{d}{dx} \ u \ \int vdx\right) dx$ Therefore, $I = xe^{x} - \int 1. \ e^{x} dx$ $I = xe^{x} - \int e^{x} dx$ $I = xe^{x} - e^{x} + C$ Hence, this is the answer

Question 3

 $\int (4x + 3)^{6} dx.$ (a) $\frac{1}{28} (4x + 3)^{7} + c$ (b) $\frac{1}{7} (4x + 3)^{7} + c$ (c) $\frac{1}{6} (4x + 3)^{6} + c$ (d) $\frac{4x}{5} + \frac{3}{5} + c$

Answer: a

Question 4

$\int_{-1}^{1} (2x^2 - x^3)_{\rm dx}$	
(a) $\frac{4}{3}$	(b) 1
(c) 2	$(d)\frac{2}{3}$

Answer: a

(a)
$$\int_{-1}^{1} (2x^2 - x^3) dx$$

= $\left[2 \times \frac{x^3}{3} \frac{-x^4}{4}\right]^1$
= $\left[\left(\frac{2}{3} \times 1^3 - \frac{1^4}{4}\right) - \left\{\frac{2}{3} \times (-1)^3 - \frac{(-1)^4}{4}\right\}\right]$
= $\left[\left(\frac{2}{3} - \frac{1}{4}\right) - \left(\frac{-2}{3} - \frac{1}{4}\right)\right]$
= $\frac{2}{3} - \frac{1}{4} + \frac{2}{3} + \frac{1}{4}$
= $\frac{4}{3}$

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Question 5 $\frac{d}{dx}$ (x. logx) (a) $x (1 + \log x)$ (b) $1 + \log x$ (d) $x^2 (\log x)$ (c) $e^x x$. log x **Answer: b Explanation:** (b) $\frac{d}{dx}(x. \log x)$ Since $\frac{d}{dx}(u, v) = u \frac{d}{dx}(v) + v \frac{d}{dx}(u)$ So here u => x $V \Rightarrow \log x$ $\therefore \frac{\mathrm{d}}{\mathrm{dx}}(\mathrm{x.}\log \mathrm{x})$ $= x. \frac{d}{dx} (\log x) + \log \times \frac{d}{dx} (x)$ $= x\frac{1}{x} + \log x \times 1$ $= 1 + \log x$ **Ouestion 6** Differentiate x^x w.r.t x. (a) $x^{x} (1 + \log x)$ (b) $\frac{y}{x}$ (c) $\frac{-y}{x}$ (d) $y + x^x \log x$ **Answer:** a **Explanation**: (a) $\frac{d}{dx}(x^x) = ?$ Net $y = X^x$ Using log both sides $\log y = x \log x$ On differentiating both sides w.r.t. x $\frac{1}{y} \cdot \frac{dy}{dx} = x \times \frac{d}{dx} (\log x) + \log x \times \frac{d}{dx} (x)$ $\frac{dy}{dx} = y \left[x \times \frac{1}{x} + \log x \times 1 \right]$ **Question 7** $x^2 \cdot e^x dx$. (a) 2x. e^x (b) $e^{x}(x^{2} - 2x)$ (c) $x^2 \cdot e^x \cdot (2x) + 2$ (d) $e^{x}(x-1)$ **Answer: b Explanation:**

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 $\int x^2 e^x dx$ Using I late $a^2 \Rightarrow 1^{st}$ function (u) $e^x \Rightarrow 2^{nd}$ function (v) $\int u.vdx = u. \int \left[\frac{d}{dx}(u). \int vdx\right] dx$ So $\int x^2 exdx$ $x^{2}\int e^{x} dx - \int \left[\frac{d}{dx}(x^{2})\int v dx\right] dx$ $x^2e^x dx - \int [2^x \cdot e^x] dx$ $x^2 \cdot e^x - 2x \int x \cdot e^x dx$ -----Equation (1) $= x \int e^x - \int \frac{d}{dx}(x) \int e^x dx dx$ $= x. e^{x} - e^{x}$ $= e^{x} (x - 1)$ -----Equation (2) Put Equation (2) in Equation (1) $x^2 \cdot e^x - 2 e^x (x-1)$ x^2 , $e^x - 2e^x$, x + 2 $=e^{x}(x^{2}-2x)+2$

<u>JULY 2021</u>

Question 1The value of $\int_{-2}^{2} f(x) dx$, where f(x) = 1+1, $x \le 0$; f(x) = 1-2x, $x \ge 0$ is(a) 20(b) -2(c) -4(d) 0

Answer: Options (b)

DEC 2021

Question 1 The cost of producing x units is 500-20x² + x³ / 3. The marginal cost is minimum at x = _____. (a) 5 (b) 10 (c) 40 (d) 50 Answer: c Explanation: Here, cost function is given by $c(x) = 500-20x^2 + \frac{x^3}{5}$ Diff. w.r.t. 'x' $\frac{d}{dx}c(x) = \frac{d}{dx} \left[500 + 20x^2 + \frac{x^3}{3} \right]$ $\frac{dc(x)}{dx} = 0 - 40x + \frac{3x^2}{3}$

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 $\frac{dc}{dx} = (x^2 - 40x)$ Marginal cost = $\frac{dc}{dx}$ = (x² - 40x) x(x-40) = 0 If x=0, if x-40 = 0 x= 40

Question 2

If $y - \frac{x^4}{e^x}$ then $\frac{dy}{dx}$ is equal to: (a) $x^3(4-x)/(e^x)^2$ (c) $x^2(4-x)/e^x$ Answer: b Explanation: If $y - \frac{x^4}{e^x}$

$$\begin{aligned} & \int e^{x} \\ \text{Diff. w.r.t. 'x'} \\ & \frac{dy}{dx} = \frac{e \times \frac{d}{dx} (x^4) - x^4 \cdot e^{x}}{(e^x)^2} \\ & = \left(\frac{e^x \cdot 4x^3 - x^4 \cdot e^x}{e^{2x}}\right) \\ & = \frac{x^3(4-x)}{e^x} \end{aligned}$$

Question 3

The speed of a train at a distance x (from the starting point) is given by $3x^2-5x+4$. What is the rate of change (of distance) at x=1?

(b) $x^{3}(4-x)/e^{x}$

(d) $x^{3}(4x-1)/e^{x}$

(a) -1 (b) 0 (c) 1 (d) 2 Answer: c Explanation:

The speed of a train at a distance x is given by V= $3x^2 - 5x + 4$ Diff. w.r.t. 'x' $\frac{dy}{dx} = 6x - 5$ $\left[\frac{dy}{dx}\right]_{x-1} = 6 \times 1 - 5 = 6 - 5 = 1$ Rate of charge (of distance) at x= 1 is 1.

<u>JUNE 2022</u>

Question 1

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$\int_0^1 \int x e^x dx$ is equal to:	
(a) 0	(b) 2
(c) 1	(d) 3
Answer: Options (c)	
Explanation:	
$\int_0^1 x e^x \mathrm{dx}$	
$\left[x\int e^{x}dx - \int \left(\frac{d}{x}x\int e^{x}dx\right)dx\right]_{0}^{1}$	
$= \left[xe^{x} - \int 1.e^{x} dx \right]_{0}^{1}$	
$= [xe^x - e^x]_0^1$	
$= (1.e^1 - e^1) - (0.e^0 - e^0)$	
= (e - e) - (0 - 1) = 0 + 1 = 1	
Question 2	
What will be $f(x)$ if $f'(x) = 10x^2 + 4x$ and $f(-3) = 17$	
(a) $f(x) = \frac{10x^3}{2} + 2x^2 + 89$	(b) $f(x) = \frac{10x^3}{2} + 2x^2 + 72$
(c) $f(x) = \frac{10x^3}{3} + 2x^2 - 89$	(d) None
Answer: Options (a)	
Explanation:	
Here $f'(x) = 10x^2 + 4x$	
on integration both side	
$\int f' 1(x) dx = \int (10x^2 + 4x) dx$	
$f(x) = 10\frac{x^3}{3} + 4\frac{x^3}{2} + C_{}(1)$	
5 2	
putting x = -3, f(-3) = $\frac{10(-3)^3}{3} + \frac{4(-3)^2}{2} + C$	
$17 = \frac{10(-27)}{3} + \frac{4 \times 9}{2} + c$	
17 = -90 + 18 - 18	
c = 89	
putting C = 89 in eq (1)	
$f(x) = 10\frac{10x^3}{3} + \frac{4x^3}{2} + 89$	
$f(x) = 10\frac{10x^3}{3} + 2x^2 + 89$	
3	
Question 3	
$\int (\log x)^2 dx \text{ is equal to:}$	
(a) $x(\log x)^2 - 2x \log x + 2x + C$	(b) $x(\log x)^2 + 2x \log x - 2x + C$
(c) $x(\log x)^2 - 2x \log x - x + C$	(d) None
Answer: Options (a)	

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Explanation:

 $I = \int (\log x)^2 dx$ = $\int (\log x)^2 . 1 dx$ = $(\log x)^2 . \int 1 dx - \int (\frac{d}{dx} (\log x)^2 . \int 1 dx) dx$ = $(\log x)^2 . -\frac{2\log x}{x} . x dx$ = $x(\log x)^2 - 2[\log x \int 1 dx - \int (\frac{d}{dx} \log x . \int 1 dx) dx]$ = $x(\log x)^2 - 2[\log x . (x) - \int \frac{1}{x} . x dx]$ = $x(\log x)^2 - 2[\log x . (x) - \int \frac{1}{x} . x dx]$ = $x(\log x)^2 - 2[\log x . (x) - \int \frac{1}{x} . x dx]$ = $x(\log x)^2 - 2[\log x - x] + C$ = $x(\log x)^2 - 2x\log x + 2x + C$

Question 4

The derivative of the function $\sqrt{x + \sqrt{x}}$ is (a) $\frac{1}{2\sqrt{x+\sqrt{x}}}$ (c) $\frac{1}{2\sqrt{x+\sqrt{x}}} \left(1 + \frac{1}{2\sqrt{x}}\right)$ Answer: Options (c) Explanation: $y = \sqrt{x + \sqrt{x}}$, Diff w. r. t 'a' $\frac{dy}{dx} = \frac{d}{dx} \left(\sqrt{x + \sqrt{x}}\right)$ $= \frac{1}{2\sqrt{x+\sqrt{x}}} \left(1 + \frac{1}{2\sqrt{x}}\right)$

(b) $1 + \frac{1}{2\sqrt{x}}$ (d) None of these

<u>DEC 2022</u>

Question 1	
If $y = x^2$ then dy/dx at x=1 is equal to	
a) 0	b) 1
c) -1	d) 2
Answer: Options (b)	
Question 2	
$\int (2x-3)^5 \mathrm{d}x \mathrm{i}s$	
a) $\frac{(2x-3)^6}{6}$	$(2x-3)^6$
a) $\frac{1}{6}$	b) $\frac{(2x-3)^6}{2}$
D	2

a) ${6}$	
c) $\frac{(2x-3)^6}{3}$	
-12	

Question 3 If $x^5 + y^5 = 0$ then $\frac{dy}{dx}$ is

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d) $\frac{(2x-3)^6}{2}$

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a) $\frac{y+x^4}{x+y^4}$	b) $\frac{y-x^4}{y^4-x}$
c) $\frac{x-y^4}{x^4-y}$	d) $\frac{x+y^4}{x^4+y}$
Answer: Options (b)	
Question 4 $\int_{x}^{4} \frac{xdx}{x^{2}+1} is$	

$x^{2}x^{2}+1$	
a) $\frac{1}{2}\log\left(\frac{17}{5}\right)$	b) $2\log\left(\frac{17}{5}\right)$
c) $\frac{1}{2}\log\left(\frac{5}{17}\right)$	d) $2 \log \left(\frac{5}{17}\right)$
Answer: Options (a)	

Question 5

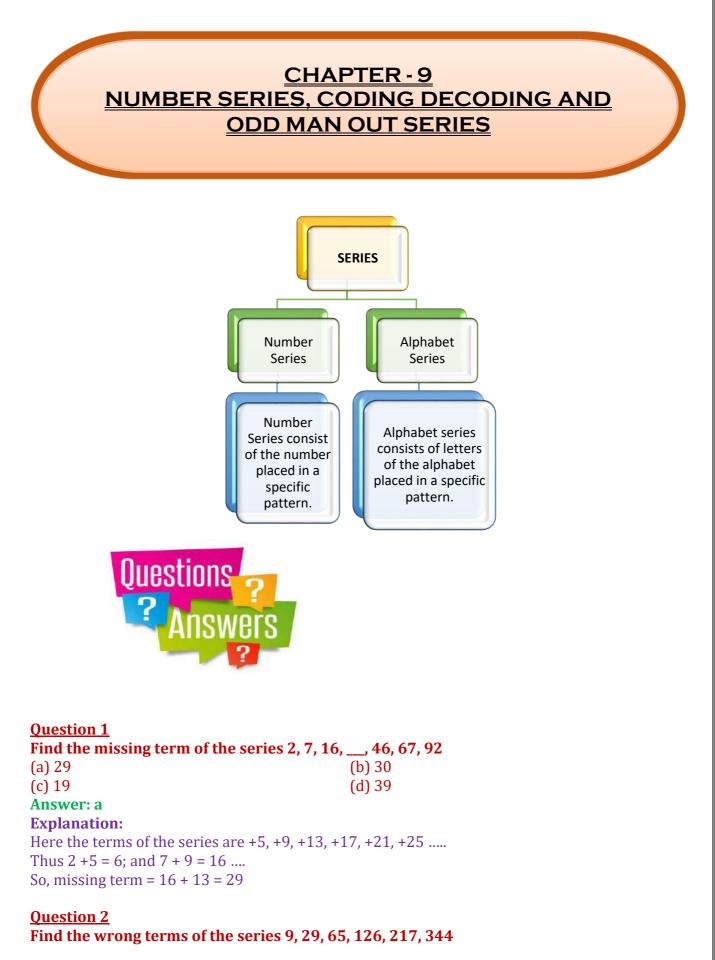
Find the area under the curve $f(x) = x^2 + 5x + 2$ with the limits 0 to 1

a) 3.833	b) 4.388
c) 4.833	d) 3.338
Answer: Options (c)	

Question 6

The maxima and minima of the function $y = 2x^3 \cdot 15x^2 + 36x + 10$ occurs respectively at

a) $x=2$ and $x=3$	b) x=1 and x=3
c) x=3 and x=2	d) x=3 and x=1
Answer: Options (C)	
Explanation:	
$f(x)=2x^3-15x^2+36x+10 \rightarrow (i)$	
Differentiate w. r to x	
$\Rightarrow f'(x) = 6x^2 - 30x + 36$	
$\Rightarrow f'(x)=0$	
$\Rightarrow 6x^2 - 30x + 36 = 0 \Rightarrow x^2 - 5x + 6 = 0$	
\Rightarrow x ² -3x-2x+6=0	
$\Rightarrow x(x-3)-2(x-3)=0$	
\Rightarrow x=3, x=2	



62	62	96	96	99
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(a) 30	(b) 29
(c) 28	(d) 27
Answer: b	
Explanation:	

Explanation:

 $2^3 + 1$, $3^3 + 1$, $4^3 + 1$... Here 29 is wrong term of series

Question 3

Find the missing term of the series 1, 9, 25, 49, 81, 121, (a) 129 (b)149

(c) 169	(d) 139
Answer: c	

Explanation:

The given terms of the series are consists square of consecutive odd number 1^2 , 3^2 , 5^2 , 7^2 , .So missing value = $13^2 = 169$

Question 4

Find the next term of the series BKS, DJT, FIU, HHV,		
(a) JGW	(b) JGV,	
(C) JVG	(d) BBA, ,	
Answer: a		

Explanation:

This type of question usually consists of a series of small letters which follow a certain pattern. However some letters are missing from the series. The missing letters are then given in proper sequence as one of the alternatives.

Question 5

3, 5, 11, 14, 17, 21 find the odd man out		
(a) 21	(b) 17	
(c) 14	(d) 3	
Answer: c		
Explanation:		
Each of the number except 14 is an odd number.		
The number '14' is the only EVEN number.		

Question 6

8, 27, 64, 100, 125, 216, 343 find the odd man out		
(a) 27	(b) 100	
(c) 125	(d) 343	
Answer: b		
Explanation:		
Except 100 all are cube of 2, 3, 4, 5, 6, and 7		

Question 7	
6, 9, 15, 21, 24, 28, 30	
(a) 28	(b) 21
(c) 24	(d) 30
Answer: a	
Explanation:	
Each of the numbers except 28 is a multiple of 3.	

Question 8

582, 605, 588, 611, 634, 617, 600 Find out the wrong number in the given sequence of numbers.

(a) 634	(b) 611
(c) 605	(d) 600
A	

Answer: a

Explanation:

Alternatively, 23 is added and 17 is subtracted from the terms so, 634 is wrong

Question 9

1, 2, 6, 15, 31, 56, 91 Find out the wrong number in the given sequence of numbers. (a) 31 (b) 91 (c) 56 (d) 15 **Answer: b Explanation:** 1, 1 + 1² = 2, 2 + 2² = 6, 6 + 3² = 15, 15 + 4² = 31, 31 + 5² = 56, 56 + 6² = 92 Last number of given series must be 92 not 91

Question 10

1, 8, 27, 64, 124, 216, 343 Find out the wrong number in the given sequence of numbers. (a) 8 (b) 27 (c) 64 (d) 124 **Answer: d Explanation:** The numbers are 1³, 2³, 3³, 4³ etc. So, 124 is wrong; it must have been 5³ i.e., 125

Question 11

8, 13, 21, 32, 47, 63, 83. Find out the wrong number in the given sequence of numbers. (a) 47 (b) 63 (c) 32 (d) 83 **Answer: a Explanation:** Go on adding 5, 8, 11, 14, 17, and 20. So, the number 47 is wrong and must be replaced by 46

(b)521

(d) 721

Question 12

Insert the missing number. 16, 33, 65, 131, 261, (....) (a) 523 (c) 613 Answer: a Explanation:

Each number is twice the preceding one with 1 added or subtracted alternatively. So, the next number is $(2 \times 261 + 1) = 523$

<u>Question 13</u> Insert the missing number 2, 4, 12, 48, 240, (....)

For Enquiry – 6262969604 (a) 960 (b) 1440 (c) 1080 (d) 1920 Answer: b Explanation: Go on multiplying the given number by 2, 3, 4, 5, 6. So, the correct next number is 1440

Question 14 Insert the missing number 8, 7, 11, 12, 14, 17, 17, 22, (...) (a) 27 (b) 20

(c) 22

Answer: b

Explanation:

There are two series (8, 11, 14, 17,) and (7, 12, 17, 22) increasing by 3 and 5 respectively.

(d) 24

Question 15

Find out the wrong number in the series.	
7, 8, 18, 57, 228, 1165, 6996	
(a) 8	(b) 18
(c) 57	(d) 228
Answer: d	

Explanation:

Let the given numbers of A, B, C, D, E, F, G. Then A, A \times 1 +1, B \times 2 +2, C \times 3 + 3 + D \times 4 + 4, E \times 5 + 5, F \times 6 + 6 are the required numbers. Clearly, 228 is wrong

Question 16

Find out the wrong number in the series 1, 2, 6, 24, 96, 720		
(a) 720	(b) 96	
(c) 24	(d) 6	
Answer: b		
Explanation:		
Go on multiplying with 1, 2, 3, 4, 5, 6 to get next numbers.		
So, 96 is wrong		

Question 17

Find out the wrong number in the series 196, 169, 144, 121, 100, 80, 64(a) 169(b) 144(c) 121(d) 80Answer: dExplanation:Number's must be $(14)^2$, $(13)^2$, $(12)^2$, $(11)^2$, $(10)^2$, $(9)^2$, $(8)^2$.So, 80 is wrong

Question 18Find out of the wrong number in series 445, 221, 109, 46, 25, 11, 4(a) 221(b) 109(c) 46(d) 80Answer: c

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Explanation:

Go on subtracting 3 and dividing the result by 2 to obtain then next number. Clearly, 46 is wrong

Ouestion 19

Find out the wrong number in the series 190, 166, 145, 128, 112, 100, 91

(a) 100 (b) 166 (c) 145 (d) 128

Answer: d **Explanation**:

Go on subtracting 24, 21, 18, 15, 12, 9 from the next number. 190-24=166 166-21 = 145145-18=127 [Here, 1288 is placed instead of 127 127-15=112 112-12 =100 ... and so on

Therefore, 128 is wrong

Question 20

In a certain code DELHI is written as CDKGH. How much is SUSPECT written in code? (b) QTRODBS (a) RTRODBS.

(c) RTIODBS Answer: a

(d) RTROIBS.

Explanation:

Clearly, we can see that each letter of the word DELHI is moved one step backward to obtain the code.

Similarly, SUSPECT will be coded as RTRODBS.

Ouestion 21

In a certain code COURAGE is written as UOCREGA. How will JOURNAL be written in the code?

(a) UOJRLAN (c) UPIRLAN

(b) UOMRLAN (d) ULOJRLAN

Answer: a **Explanation**:

Clearly, when COURAGE is coded, some letters are interchange with respect to their positions, i.e. odd positions are interchanged.

Position of 1 changes to 3 and 3 to 1. Position of 5 changes to 7 and 7 to 5. Can be coded as UOIRLAN

Ouestion 22

Find out the wrong number in the series.	
19, 26, 33, 46, 59, 74, 91	

1,20,00,10,07,71,71	
(a) 26	(b) 33
(c) 46	(d) 59
Answer: b	

Explanation:

Go on adding 7, 9, 11, 13, 15, 17 respectively to obtain the next number, So, 33 is wrong it must be 35

Question 23

 Find out the wrong number in the series 1, 3, 10, 21, 64, 129, 356, 777

 (a) 10
 (b) 21

 (c) 64
 (d) 356

 Answer: d

 Explanation:

 A × 2 + 1, B × 3 + 1, C × 2 + 1, D × 3 + 1 and so on.

So, 356 is wrong

Question 24

Find out the wrong number in the series 6, 12, 48, 100, 3884, 768, 3072(a) 768(b) 384(c) 100(d) 48Answer: cExplanation:Each even term of the series is obtained by multiplying the previous term by 2. 2^{nd} term = $(1^{st}$ term) × 2 = 6 × 2 = 12 4^{th} term = $(3^{rd}$ term) × 2 = 48 × 2 = 96. 6^{th} term = $(5^{th}$ term) × 2 = 384 × 2 = 768. \therefore 4th term should be 96 instead of 100

Question 25

Insert the missing number. 7, 26, 63, 124, 215, 342, (...) (a) 391 (b) 421 (c) 481 (d) 511 Answer: d Explanation: Numbers are $(2^3 - 1)$, $(3^3 - 1)$, $(4^3 - 1)$, $(5^3 - 1)$, $(6^3 - 1)$, $(7^3 - 1)$ etc. So, the next number is $(8^3 - 1) = (512 - 1) = 511$.

Question 26

Find the odd man out? 396, 46	52, 572, 427, 671, 264
(a) 671	(b) 462
(c) 427	(d) 264
Answer: c	

Explanation:

Here the given series is 396, 462, 572, 427, 671, and 264. In all the terms, the middle digit is the sum of first and third digit except 427. So the odd number in the given series is 427.

Question 27

 Insert the missing number. 2, 4, 12, 48, 240, (...)

 (a) 960
 (b) 1440

 (c) 1080
 (d) 1920

 Answer: b
 Explanation:

 Go on multiplying the given number by 2, 3, 4, 5, 6.
 So, the correct next number is 1440.

<u>Question 28</u> Find the odd man out 41, 43, 47, 53, 61, 71	, 73, 81	
(a) 41	(b) 61	
(c) 71	(d) 81	
Answer: d		
Explanation:		
Each of the number except 81 is a prime num	ber.	
<u>Question 29</u> Find out the wrong number in the given se 617, 600	equence of numbers 582, 605, 588, 611, 634,	
(a) 634	(b) 611	
(c) 605	(d) 600	
Answer: a		
Explanation:		
Alternatively, 23 are added and 17 is subtract	ted from the terms. So, 634 is wrong.	
Question 30		
Find out the wrong number in the given se	· · · · · · · · · · · · · · · · · · ·	
(a) 31	(b) 91	
(c) 101 Answer: b	(d) 15	
Explanation:		
1, $1 + 1^2 = 2$, $2 + 2^2 = 6$, $6 + 3^2 = 15$, $15 + 4^2 = 3$	$21 \ 31 \ 52 \ - \ 56 \ 56 \ - \ 62 \ - \ 92$	
Last number of given series must be 92 not 9		
Last number of given series must be 92 not 9	L	
Question 31		
Find odd number: 324, 244, 136, 352, 514		
(a) 324	(b) 244	
(c) 136	(d) 352	
Answer: a		
Explanation:		
Sum of the digits in each other number is 10. 324 = 9		
524 - 9		
Question 32		
Find odd Number: 43, 53, 63, 73, 83		
(a) 43	(b) 53	
(c) 63	(d) 73	
Answer: c		
Explanation:		
Each of the numbers except 63 is a prime number.		
Question 33		
Find odd number: 10, 26, 24, 21, 18		
(a) 10	(b) 26	
(c) 24	(d) 21	
Answer: d		

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Explanation:

Each of the numbers except 21 is n even number.

Question 34

Find odd number: 51, 144, 64, 121, 256	
(a) 51	(b) 144
(c) 64	(d) 121
Answer: a	
Explanation:	
Each of the number except 51 is a perfect square.	

Question 35 Find odd number 15, 21, 24, 28, 30 (a) 15 (b) 21 (c) 24 (d) 28 Answer: d Explanation: Each of the numbers of except 28, is divisible by 3.

Question 36

Find odd number: 2384, 1592, 3756, 42	98, and 3629
(a)2384	(b) 1592
(c) 3629	(d) 3756

Answer: c Explanation:

In all other numbers, the last digit is two times the first, all are even but 3629 is ODD.

Question 37

Choose odd number: 7359, 1593, 9175, 3781,9317		
(a) 7359	(b) 1593	
(c) 3756	(d) 3781	
Answer: d		
Explanation:		

All other numbers consist of odd digits only. Sum of all digits is prime in D.

Question 38

Find odd number: 8314, 2709, 1315, 2518, 3249		
(a) 8314	(b) 2709	
(c) 1315	(d) 2518	
Answer: a		
Explanation:		

Explanation:

In all number except 8314, the sum of first three digits is equal to the unit's digit. Hence, the answer is (a).

Question 39Find odd number: 48, 12, 36, 24, and 59(a) 48(b) 12(c) 36(d) 59Answer: d

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Explanation:

In all numbers except 59, the unit's digit is twice the ten's digit. Hence the answer is (d). And all are multiples of 12 too except 59

Question 40	
Find odd number: 2345, 3456, 5467, and 5	
(a) 2345	(b) 3456
(c) 5467	(d) 567
Answer: c	
Explanation:	
All other numbers contain four consecutive di	gits in order.
Ouestion 41	
Find the odd man out.	
(a) ZW	(b) TQ
(c) SP	(d) NL
Answer: d	
Explanation:	
Z ⁻³ W, T ⁻² Q, S ⁻³ P, N ⁻² L, P ⁻³ M	
So the answer will be NL, which is choice (d).	
bo the unswer win be full, which is choice (u).	
Ouestion 42	
Find the odd among the following.	
(a) 1011	(b) 1101
(c) 1111	(d) 10001
Answer: c	
Explanation:	
These numbers follow the binary coding. Let's	convert them into decimal.
$1011 = 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 1 \times 2^0$	
= 8 + 0 + 2 + 1	
= 11	
$1101 = 1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$	
= 8 + 4 + 0 + 1	
= 13	
$1111 = 1 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 1 \times 2^0$	
= 8 + 4 + 2 + 1	
=15	
$10001 = 1 \times 2^4 + 0 \times 2^3 + 0 \times 2^2 + 0 \times 2^1 + 1 \times 2^2$	20
= 16 + 0 + 0 + 0 + 1	
= 17	

Here, choice (c) will be the answer because 15 is not a prime number but all others are prime numbers.

Question 43

Which of the following is wrong in the following series		
2, 7, 25, 77, 238, 723, (a) 7	(b) 238	
(c) 77	(d) 25	

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Answer: d Explanation: -1, 3^2 , -2, 3^3 , -3, and $3^4 - 4$,.... The number in place of 25 should be $24 = 3^3 - 3$. Hence (d) is the correct answer.

Question 44Choose the term which will continue the following series -E3C, G5F, I8I, K12L,?(a) L170(b) M19M(c) N180(d) M160Answer: dExplanation:The first latters of the terms are alternate. The difference between the terms

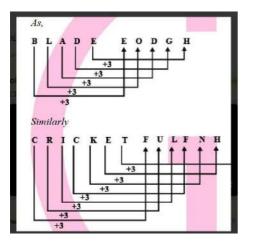
The first letters of the terms are alternate. The difference between the 1st and 2nd number is 2, 2nd and 3rd number is 3 and so on. Last letter of the 2nd number is 3 terms a head of the last term of previous one. Thus the next term would be M160. Hence the answer is d.

Question 45

If EOGH is the code for BLADE, what is the code for CRICKET?

(a) FULFNHW (c) HJLFNHW **Answer: a Explanation:** FULFNHW

(b) ULFNHW (d) ULFHJ



 Question 46

 If EARTH is coded as 41590 and PALE as 2134, what is the code for PEARL?

 (a) P=2, E=4, A=0, R=5, and L=3

 (b) P=2, E=4, A=1, R=5, and L=3

 (c) P=2, E=4, A=1, R=5, and L=8

 (d) P=8, E=, A=1, R=5 and L=3

 Answer: b

 Explanation:

 24153 codes for letters are: P=2, E=4, A=1, R=5, and L=3

Question 47

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In a certain language, 'put tir fin' means ' 'beautiful white lily', and 'sig lon fin' mea	delicious juicy fruit'; 'tie dip sig' means ns ' lily and fruit '. What is the code for 'and'?
(a) lon	(b) Oin
(c) Sag Answer: a	(d) None
Explanation:	
'lon' Common code from first and third statemen	t for 'fin' is 'fruit' From Second and third
statement, 'sig' is 'lily'. So 'lon' means 'and 'in	
Question 48	
The word RUN is coded as SVO. What sho (a) MBZ	(b) MBL
(c) BKL	(d) MBA
Answer: a	
Explanation: ∴ LAY should be MBZ.	
PASTEXAMINA	TION QUESTIONS:
	<u>Y 2018</u>
Question 1	
PILLER written in that code?	613382 and LIFE is written 8162. How is
(a) 318826	(b) 318286
(c)618826	(d) 33881
Answer: a	
Explanation:	
PILLER is return that code is 318826	
Question 2	
	good', '637' means 'we are bad' and '358'
(a) 2	llowing represents 'and' in that code? (b) 5
(c) 8	(d) 3
Answer: c	
Explanation:	
256 means 'you are good'	
637 means 'we are bad'	
358 means 'Good and Bad' Here code of 'are' is 3	

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Code of good is 5 Code of and is 8

Question 3If LOSE is coded as 1357 and GAIN is code as 2468, what do figure 82146 for?(a) NGLAI(b) NGLIA(c) GNLIA(d) GNLAAnswer: aExplanation:82146 is stands for NGLAI

<u>NOV 2018</u>

<u>Question 1</u> If PLAY is coded as 8123 and RHYME is coded as 49367. What will be code of MALE?

(a) 6217		(b) 6198
(c) 6395		(d) 6285
Answer: a		
	402(7)	

Play = 8123, RHYME = 49367 then because M = 6, A = 2, I = 1, E = 7

Question 2

 Find out the next number in the following series 7, 11, 13, 17, 19, 23, and 25)

 (a) 30
 (b) 29

 (c) 32
 (d) 33

 Answer: b

 Explanation:

 Given series

 7, 11, 13, 17, 19, 23, 25, 29.

 A prime number series, next prime number is 29

Question 3	
If HONEY is coded as JQI	PGA, which word is code as VCTIGVV?
(a) CARPETS	(b) TRAPETS
(c) TARGETS	(d) UMBRELU
Answer: c	

Question 4 Find odd man out of the following series 15,, 21, 63, 81, 69. (a) 15 (b) 21

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(c) 63	(d) 81
Answer: d	
Explanation:	
15, 21, 63, 81, 69	
Only 81 is a perfect square.	
Question 5	
Find odd man out of the following ser	ies 7, 9, 13, 17, 19
(a) 7	(b) 9
(c) 19	(d) 13
Answer: b	
Explanation:	
7, 9, 13, 17, 19	
9 is the odd man out	
Need to find odd number form given five	e numbers that are 9, 9, 13, 17, 19
A prime number is a whole number grea	ater than 1 whose only factors are 1 and itself.
Let's do prime factorization of each num	lber
Prime factorization of 7 is 7×1	

Prime factorization of 7 is 7×1

Prime factorization of 13 is 13×1

Prime factorization of 17 is 17×1

Prime factorization of 19 is 19×1

But 9 is not a prime number. Since its factors are 3 and 1 and 9.

So the odd man out is 9.

<u>MAY 2019</u>

Question 1 If in a certain language, MADRAS is code as NBESBT, how is BOMBAY coded in that language? (b) CPNCBZ (a) CPNCBX (d) CQOCBZ (c) CPOCBZ **Answer: b Explanation**: Clearly every letter is increased by 1 as M+1 N A+1 B D+1 E R+1 S A+1 B S+1 T So after increasing every character in work BOMBAY by 1, we get

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Question 2	
Which of the following is odd one?	
(a) CEHL	(b) KMPT
(c) OQTX	(d) NPSV
Answer: d	
Explanation:	
a. $\begin{array}{c} CEH \ L \\ 35812 \end{array}$ b. $\begin{array}{c} K \ M \ P \ T \\ 11131620 \end{array}$ c. $\begin{array}{c} N \ P \ S \ V \\ 14161923 \end{array}$	
Last no. of all option is even except optic	on a i.e., oaa
Question 3	
Which of the following is odd one 4, 1	2. 44. 176. 890?
(a) 4	(b) 12
(c) 44	(d) 176
Answer: c	
Explanation:	
$4 \div 4 = 1$	
$12 \div 4 = 3$	
$44 \div 4 = 11$	
$176 \div 4 = 44$	
$890 \div 4 = 222.4$	
Clearly, 890 is only number that is not co	ompletely by 4.
So, this is the odd one.	
Question 4	
Complete the series.	
7, 23, 47, 119, 167	
(a) 211	(b) 223
(c) 49	(d) 120
Answer: c	
Explanation:	
Consider the provided series.	
7, 23, 47, 119, 16, In order to find the next term of the serie	as absorve the pattern as shown below.
$7 = 9 - 2 = 3^2 - 2$	es observe the pattern as shown below.
$7 = 9 = 2 = 3^{\circ} = 2^{\circ}$ 23 = 25 - 2 = 5 ² - 2	
23 - 23 - 2 - 3 - 2 $47 = 49 - 2 = 7^2 - 2$	
47 - 49 - 2 = 7 - 2 $119 = 121 - 2 = 11^2 - 2$	
119 = 121 = 2 = 11 = 2 $167 = 169 - 2 = 13^2 - 2$	
Square the next prime number and subt	ract 2 from it
$17^2 - 2 = 289 - 2 = 287$	

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Hence, the next number of the series is 287									
<u>NOV 2019</u>									
Question 1									
Complete the series.									
4, 16, 36, 64, 100									
(a) 144 (b) 121									
(c) 49 (d) 120									
Answer: A									
Explanation:									
(a) Given series									
4, 16, 36, 64, 100, $2^2 = 4, 4^2 = 16, 6^2 = 36, 8^2 = 64, 10^2 = 100$									
The series is of squares of even no.' s so after 100 it will be									
$12^2 = 144$									
Question 2									
Find the odd man out,									
1, 5, 14, 30, 51, 55, 91									
(a) 5 (b) 55									
(c) 51 (d) 91									
Answer: c									
Explanation:									
As the series is having the sum of all squares of natural numbers	er therefore 51 is the odd								
number.									
Question 3									
Find the odd man out 5, 10, 17, 27, 37;									
(a) 5 (b) 17									
(c) 27 (d) 10									
Answer: c									
Explanation:									
(c) $(2 \times 2) + 1 = 5$									
$(3 \times 3) + 1 = 10$									
$(4 \times 4) + 1 = 17$									
But $(5 \times 5) + 1 = 26$									
$(6 \times 6) + 1 = 37$									
So 27 is odd man out.									
Question 4									
Complete the series									
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4, 16 _____ 256, 1024

(a) 32	(b) 48
(c) 64	(d) 46
Answer: c	
Explanation:	

(c) $4^1 = 4$ $4^2 = 4 \times 4 = 16$ $4^3 = 4 \times 4 \times 4 = 64$ $4^4 = 4 \times 4 \times 4 \times 4 = 256$ $4^5 = 4 \times 4 \times 4 \times 4 \times 4 = 1024$

So the third form of the series is 64.

Question 5

SYSTEM is coded as 131625 then TERMS will be coded as?

(a) 62251	(b) 62451
(c) 64251	(d) 62415
Answer (h)	

nswer: (b) Since in

SYSTEM 131625

(Given)

TERMS 62451

∴ As R cannot be 2 as E has already been assigned the value as 2 R's value left will be 4 as per given option.

DEC 2020

Question 1	
Find the missing value in the series (0, 2, 3, 6, 10, 17, 28, ? 75 .
(a) 58	(b) 46
(c) 48	(d) 54
Answer: b	
Explanation;	
2+3 +1=6	
3+6 +1=10	
6+10 +1=17	
You go on like this and the next numbe	r will be 17 + 28 + 1 = 46

Question 2

For Enquiry - 6262969604 6262969699 **78** $\frac{3}{8}$, $\frac{8}{19}$, $\frac{18}{41}$, ?, $\frac{78}{173}$ (a) <u>38</u> (b) $\frac{83}{38}$ (d) None C 38 Answer: a **Explanation**: 3+5=88+10 = 1818 + 20 = 3838 + 40 = 78= 38/85 **Question 3** Find Odd man out of the following 6, 9, 12, 18, 21, 26, and 30 (a) 24 (b) 30 (c) 26 (d) 9 **Answer: c Explanation**: Each of the numbers except 26, is a multiple of 3. **Question 4** If in a certain language HEALTH is coded as IFBMUI then what is the code for **NORTH** (a) OPSUI (b) OPUSI (c) OUSPI (d) OIPSU **Answer:** a **Explanation**: Given HEALTH is coded as IFBMUI To find code for North In HEALTH each letter is coded as: Each letter of HEALTH is moved one step forward and coded as IFBMUI Similarly for NORTH we have to move one step forward in each letter so North will be coded as OPSUI. **Question 5** Find the Wrong Term in: G4T, J10R, M20P, P43N, S90L (a) M20P (b)P43N (c) **J10**R (d) G4T **Answer: c Explanation**:

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The first letter of each term is moved three steps forward and the last letter is moved two steps backward to obtain the corresponding letters of the next term.

The numbers follow the sequence $\times 2+1, \times 2+2, \times 2+3, \times 2+4$. So, 10 is wrong and must be replaced by $(4 \times 2+1)$ i.e. 9.

<u>JAN 2021</u>

(b) $\frac{10}{17}$ (d) $\frac{12}{35}$

Question 1

1 3	5		-2
2'4	' <mark>8</mark> '	16	-:
(a)	9		
(a)	32		
(-)	11		
(c)	34		
	54		

Answer: a

Explanation:

9/32 because the numerators are the consecutive odd numbers and the denominators are consecutively being multiplied by 2.

Question 2	
Find the missing term:	
P3C, R5F, T8I, V12L,?	
(a) Y170 (b) X17M	
(c) X170 (d) X 160	
Answer: c	
Explanation:	
Option C is the correct answer	
In the following series first letter is moved two steps forward, second number	
2,3,4,5 step forward, and third letter is moved and third letter is moved three	steps
forward to form the next term of the series	
Following the series the next term will be X170	
Question 3	
Find out the odd man in the sequence 8, 27, 64, 125, 196, 216.	
(a) 27 (b) 196	
(c) 125 (d) 216	
Answer: b	
Explanation:	
The given numbers are : 8, 27, 64, 125, 196, 216, .	
Among these ,196 is the odd one out .	
It is because all the other numbers are perfect cubes whereas 196 is a perfect	square
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Question 4 In a certain code language, BEAT is written as YVZG, and then what will be the code for MILD? (a) ONRW (b) NOWR (d) NROW

(c) ONWR

Answer: d

Explanation:

Given, BEAT is written as YVZG.

We know that B, E, A, T are respectively the 2nd, 5th, 1st and 20th letters from the beginning of the English alphabet. The letters of the code Y, V, Z, G are respectively the 2nd, 5th, 1st and 20th letters from the end of the English alphabet. Similarly, M, I, L, D are respectively the 13th, 9th, 12th and 4th letters from the beginning of the English alphabet. Now, the 13th, 9th, 12th and 4th letters from the end of the English alphabet are N, R, O, W respectively. So, MILD is coded as NROW. Hence, option (D) is the correct answer.

Ouestion 5

In a certain code RIPPLE is written as 613382, and LIFE is written as 8192. How will PILLER be written in that code?

(b) 689912
(d) 629981
Y 2021

Ouestion 1 Chose the missing term in the series..... 1,1, 8, 4, 27,____64,16 (a) 27 (b) 11 (c) 9 (d) 125 **Answer: Options (c) Explanation**: Correct option is c = 9

The series consists of squares and cubes of squ	ares and cubes of consecutive natural
numbers i.e.	
1 ² , 1 ³ , 2 ³ , 2 ² , 3 ³ , 4 ³ , 4 ² ,	
So missing term = $3^2 = 9$	
Question 2	
The wrong term in the series 225, 196,	169, 121, 100, 77, 64, is
_) 77
(c) 100 (d) 169
Answer: Options (b)	
Explanation:	
Correct option is b = 77	
By taking a close look at all the numbers in the	sequence it is clear that all the given
numbers are perfect squares of numbers.	-
15 × 15 = 225	
$14 \times 14 = 196$	
13 × 13 = 169	
$11 \times 11 = 121$	
$10 \times 10 = 100$	
$9 \times 9 = 81$ but the number given in the series is	77
So 77 is the wrong term from the series.	
Option b is the correct Answer	
Question 3	
If Delhi is coded as EFMIJ then Jaipur is code	ed as_
) QVSKBJ
) KBJQVŚ
Answer: Options (d)	
Question 4	
If frame is coded as 0618011305 then Arise	is coded as
) 0119091805
) 0118091805
	, - <u>-</u>
Answer: Options (a)	
Question 5	
If Clock is coded as 34235 and Time as 8679) then Motel is coded as
) 72964
) 77684
	J / / 004
Answer: Options (c)	

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DEC 2021

Ouestion 1

If MOUSE, is coded as 34651 and KEY is coded as 217, then how will YES be coded? (b) 517

(a) 715

(c) 175

Answer: a

Explanation:

Μ	0	U	S	Е	К	E	Y	Y	Е	S
3	4	6	5	1	2	1	7	7	1	5

(d) 571

Question 2

What comes at the last place in R, U, X, A, D? (b) F (a) E (c) G (d) H **Answer: c Explanation**: We have R + 3 = UU + 3 = XX + 3 = AA + 3 = DD + 3 = G

Question 3

The missing term of the	e series 4, 13,49, 76 is
(a) 26	(b) 30
(c) 28	(d) 32
Answer: b	

Ouestion 4

Find the odd one from the following

(a) Zebra	(b) Horse
(c) Giraffe	(d) Tiger

Answer:

Explanation:

Here, Zebra, Giraffe, Horse are herbivorous animal Except 'Tiger'.

Question 5

In certain code, MENTION is written as LNEITNO. How is PRESENT written in that code?

(a) NTSEREO

(b) OERESTN

(c) ERESTNO

(d) ROESTNE

Answer: b Explanation:

In the certain code. It is proved that the correct answer is b

Question 6

If in a certain code "THANKS" is written as "SKNTHA" then how us "STUPID" written?

(a) DIPUTS

(c) DIPUST

(b) DISPUT(d) DIPSTU

Answer: d

Explanation:

The code of THANKS is made as follows

The last three letters are reversed, and then the first three letters are written as it is. Similarly, the code of STUPID would be DIPSTU.

<u>IUNE 2022</u>

Question 1

7, 26, 63, 124, 215, 342?	
(a) 511	(b) 672
(c) 508	(d) 556
Answer: Options (a)	
Explanation:	
7, 26, 63, 124, 215, 342	
Here, $2^3 - 1 = 7$, $6^3 = 216 - 1 = 215$	
$3^3 - 1 = 26$, $7^3 = 343 - 1 = 342$	
$4^3 - 1 = 63$, $8^3 = 512 - 1 = 511$	
$5^3 - 1 = 124$	
Question 2	
LOUTS is coded as 14692 and STDANCE	is codes as 2600'

LOUTS is coded as 14682 and STRANGE is codes as 2690753. How will you code GESTURE

(a) 5236893 (c) 5346893 Answer: Option Explanation:	s (d)	(b) 5326793 (d) 5326893
$\begin{array}{c} L O U T S \\ \downarrow \downarrow \downarrow \downarrow \downarrow \downarrow \\ 1 4 6 8 2 \end{array}$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{ccccc} G & E & S & T & U & R & E \\ \downarrow & \downarrow \\ 5 & 3 & 2 & 6 & 8 & 9 & 3 \end{array}$

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Question 3	
4, 6, 9, 13, 5, 30.375	
(a) 40.50	(b) 20.25
(c) 40.75	(d) 60.25
Answer: Options (b)	
Explanation:	
4, 6, 9, 13.5, 20.25 30.375	
×15 ×1.5 ×1.5 ×1.5	
×1.5 ×1.5 ×1.5 ×1.5 ×1.5	
Question 4	
Code for Word EARTH is 16235 and VEN	US 91784 what is code for SATRUN?
(a) 423827	(b) 463827
(c) 463877	(d) 413827
Answer: Options (b)	
Explanation:	
EARTH VENUS SA	
	$\downarrow \downarrow \downarrow \downarrow$
16235 91784 46	3827
Question 5	
Find out the next term –	
7, 11, 27, 63, 127,	
(a) 511	(b) 227
(c) 5100	(d) 255
Answer: Options (b)	
Explanation:	
7, 11, 27, 63, 127, 227	
7, 11, 27, 63, 127, 221	
2 42 67 88 109	
Question 6	
Find the next terms –	
3, , 15, 31, ?, 127	
(a) 62	(b) 63
(c) 64	(d) 65
Answer: Options (b)	
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Explanation: 3, 7, 15, 31, 63, 127 $3 \times 2 + 1 = 7$ $7 \times 2 + 1 = 15$ $15 \times 2 + 1 = 31$ $31 \times 2 + 1 = 63$ $63 \times 2 + 1 = 127$

Question 7

Explanation: 6, 13, 28, 59, 122 $6 \times 2 + 1 = 13$ $13 \times 2 + 2 = 28$ $28 \times 2 + 3 = 59$ $59 \times 2 + 4 = 122$

Find out the next term-6, 13, 28, 59, ?

(a) 122	(b) 114
(c) 113	(d) 112
Answer: Options (b)	

DEC 2022

Question 1

If ROSE is coded as 6821, CHAIR is coded as 73456 and PREACH is coded as 961473, what will be the code for SEARCH?

a) 246173	b) 214673
c) 216473	d) 214763

Answer: Options (b) Explanation: As per the codes given **ROSE=682** CHAIR=73456 **PREACH=961473** Code for SEARCH will be=214673

answer is Option (b)

Question 2

In certain code language, if TOUR is written as 1234, CLEAR is written 5678 and SPARE is written as 90847, find the code for CARE?

a) 1247	b) 4847
c) 5247	d) 5847

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Answer: Options (d)

Explanation: The code for TOUR is:

Т	0	U	R
1	2	3	4

The code for CLEAR is:

С	L	E	A	R
5	6	7	8	4

The code for SPARE is:

S	Р	A	R	E
9	0	8	4	7

Similarly,

The code for CARE is:

С	Α	R	E
5	8	4	7

Hence, '5847' is the correct answer.

Question 3

How many 3 digit odd numbers can be formed using the digits 5, 6, 7, 8, 9, if the digits can be repeated?

•	· · · · · · · · · · · · · · · · · · ·	
a) 55		b) 75
c) 65		d) 85
	· · · · · · · · · · · · · · · · · · ·	

Answer: Options (b)

Explanation:

Let us take the 3digit number as H T U (Hundreds, tens, unit digit) respectively To make 3 digit number as odd

5, 7, 9 are only possibly be used in the unit digit place

In hundreds and tens place all 5 digits are possible

Number of ways for unit digit = 3 Number of ways for tens digit = 5 Number of ways for hundreds digit = 5

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Number of 3 digits odd number = $3 \times 5 \times 5 = 75$:. 75 Three-digit odd numbers can be formed from the digits 5, 6, 7, 8, 9 if the digits can be repeated

Question 4 Find the odd man out: 34, 105, 424, 2123, 12756 a) 12756 b) 2123 c) 424 d) 34 Answer: Options (b) Explanation: 3rd term = (2nd term) x 2 + 2 = 16 x 2 + 2 = 34.

4th term = (3th term) x 3 + 3 = 34 x 3 + 3 = 105. 5th term = (4th term) x 4 + 4 = 105 x 4 + 4 = 424 6th term = (5th term) x 5 + 5 = 424 x 5 + 5 = 2125 \therefore 6th term should 2125 instead of 2123.

Question 5

If 'FORZEN' is decoded as 'OFAPSG'. Tick the right option that depicts "MOLTEN" written in this way?

a) OFPOMN	b) OFSMPN
c) OFUMPN	d) OFUNPN

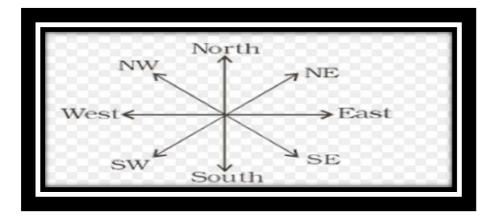
Answer: Options (c)

Explanation:

Reverse the word and move each letter +1 . Reverse of MOLTEN is NETLOM add 1 to each letter of NETLOM. So code of MOLTEN become OFUMPN.

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<u>CHAPTER - 10</u> DIRECTION SENSE TEST



ALWAYS REMEMBER:

LEFT & LEFT	Down
RIGHT& LEFT	UP
LEFT& RIGHT	UP
RIGHT & RIGHT	Down
UP & LEFT	Left
UP & RIGHT	Right
DOWN & LEFT	Right
DOWN & RIGHT	Left



Question1

One morning Udai and Vishal were talking to each other face to face at a crossing. If Vishal's shadow was exactly to the left of Udai, which direction was Udai facing? (a)East. (b) West

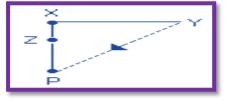
(c) North Answer: C Explanation: (b) West (d)South

For Enquiry -6262969604	6262969699
Vishal's Shadow Vishal	

Question2

Y is in the East of X which is in the North of Z. If P is in the South of Z, then in which direction of Y, is P?

(a)North (c) South-East **Answer: D Explanation:** (b) South (d)None of these



P is in South-West of Y

Question 3

If South-East becomes North, North-East becomes West and so on. What will West become?

(a)North-East (c) South-East Answer: C Explanation: (b) North-West(d)South-West



It is clear from the diagrams that new name of West will become South-East

Question4

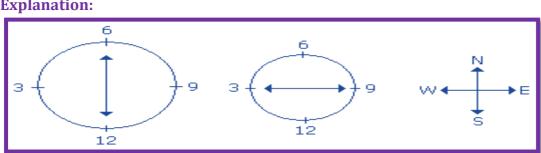
A man walks 5 km toward south and then turns to the right. After walking 3 km he turns to the left and walks 5 km. Now in which direction is he from the starting place?

(a)North-East (c) South-East Answer: D Explanation

(b) North-West (d)South-West.

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 Image: Second Second



At 9.15 P.M., the minute hand will point towards west

Question6

Two cars start from the opposite places of a main road, 150 km apart. First car runs for 25 km and takes a right turn and then runs 15 km. It then turns left and then runs for another 25 km and then takes the direction back to reach the main road. In the meantime, due to minor break down the other car has run only 35 km along the main road. What would be the distance between two cars at this point?

(a)65 km	(b) 75 km
(c) 80 km	(d)85 km
Answer: A	

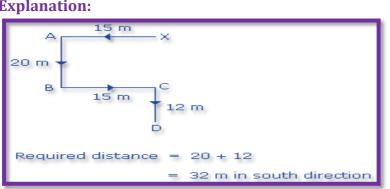
Explanation: 25 km. Ð. 15 km 25 km. 35km. -- D • E \sim 150 km. $\times \mathbf{k}$ Required distance DF 150 - (25 + 25 + 35)150 - 85 65 km.

Question 7

Starting from the point X, Jayant walked 15 m towards west. He turned left and walked 20 m. He then turned left and walked 15 m. After this he turned to his right and walked 12 m. How far and in which directions is now Javant from X?

(a)32 m, South (c) 42 m, North **Answer: A Explanation**:

(b) 47 m, East (d)27 m, South



Ouestion 8

One evening before sunset Rekha and Hema were talking to each other face to face. If Hema's shadow was exactly to the right of Hema, which direction was **Rekha facing?**

((a)North c) East Answer: B Explanation:	(b) South (d)Data is inadequate
	Rekha Hema's shado	

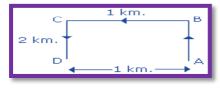
In the evening sun sets in West. Hence then any shadow falls in the East. Since Hema's shadow was to the right of Hema. Hence Rekha was facing towards South.

Ouestion 9

Hema's

A boy rode his bicycle Northward, then turned left and rode 1 km and again turned left and rode 2 km. He found himself 1 km west of his starting point. How far did he ride northward initially?

(a)1 km (c) 3 km **Answer: B Explanation**:



The boy rode 2 km. Northward.

(b) 2 km. (d)5 km

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<u>Question10</u> K is 40 m South-West of L. If M is 40 m South-East of L, then M is in which direction of K?

(a)East (b) West (c) North-East (d)South Answer: A Explanation:

Hence M is in the East of K.

Question11

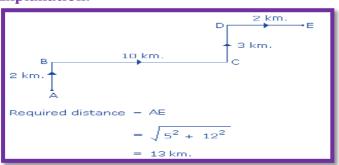
A man walks 2 km towards North. Then he turns to East and walks 10 km. After this he turns to North and walks 3 km. Again he turns towards East and walks 2 km. How far is he from the starting point?

(b) 13 km

(d)None of these

(a)10 km (c) 15 km **Answer: B**

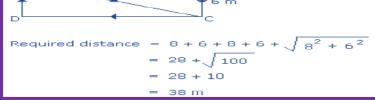
Explanation:



Question 12

The length and breadth of a room are 8 m and 6 m respectively. A cat runs along all the four walls and finally along a diagonal order to catch a rat. How much total distance is covered by the cat?

(a)10 (c) 38 Answer: C Explanation:		(b) 14 (d)48
A B m	B 6 m	



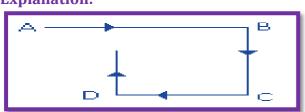
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Question13

One morning sujata started to walk towards the Sun. After covering some distance, she turned to right then again to the right and after covering some distance she again turns to the right. Now in which direction is she facing?

(a)North (c) North-East **Answer: A Explanation**: (b) South(d)South-West



Hence finally Sujata will face towards North.

Question14

Some boys are sitting in three rows all facing north such that A is in the middle row. P is just to the right of A but in the same row. Q is just behind of P while R is in the North of A. In which direction of R is Q?

(a)North (c) North-East Answer: b Explanation:		(b) South- East (d)South-West		
	Row 1	R		Ņ
	Row 2	A	P	W←→E
	Row 3		Q	Š

Q is in South-East of R

Question15

One morning after sunrise, Vimal started to walk. During this walking he met Stephen who was coming from opposite direction. Vimal watch that the shadow of Stephen to the right of him (Vimal). To which direction Vimal was facing?

(a) East

(c) South

(b) West(d) Data inadequate

Answer: C Explanation:

Sun rises in the east. So the shadow of a man will always falls towards the west. Since the shadow of Stephen is to the right of Vimal. Hence Vimal is facing towards South.

Question 16	
Golu started from his hou	se towards North. After covering a distance of 8 km. he
turned towards left and c	overed a distance of 6 km. What is the shortest distance
now from his house?	
(a)10 km	(b) 14 km
(c) 14 km	(d)2 km

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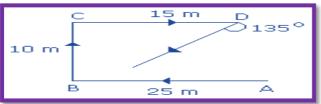
Answer: A Explanation:

C 5 km. B km. A	
Required distance	- AC
	$=\sqrt{8^2+6^2}$
	$=\sqrt{64+36}$
	- / 100
	= 10 km.

Question 17

P started from his house towards west. After walking a distance of 25 m. He turned to the right and walked 10 m. He then again turned to the right and walked 15 m. After this he is to turn right at 1350 and to cover 30 m. In which direction should he go?

(a)West (c) South-West Answer: C Explanation: (b) South (d)South-East

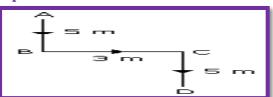


Hence he should go in the South-West direction.

Question18

X-Men started to walk straight towards south. After walking 5 m he turned to the left and walked 3 m. After this he turned to the right and walked 5 m Now to which direction X is facing?

(a)North-East (c) North Answer: B Explanation:



(b) South (d)South-West

Hence X-Men will face in the end towards South.

Question 19

Hemant in order to go to university started from his house in the east and came to a crossing. The road to the left ends in a theatre, straight ahead is the hospital. In which direction is the university?

For Enquiry -6262969604 (b) South (a)North (c) East (d)West **Answer: A Explanation**: (N) University Crossing (W) Hospital 🖣 (E) House Theatre (S)

Therefore, university is in North

Question 20

If a boy starting from Nilesh, met to Ankur and then to Kumar and after this he to Dev and then to Pintu and whole the time he walked in a straight line, then how much total distance did he cover?

(a)215 m	(b) 155 m
(c) 245 m	(d)185 m
Answer:A	
Explanation:	
Required distance = $25 \text{ m} + 40 \text{ m} + 60 \text{ m} + 9$	0 m
Required distance = 215 m	

Question 21

Each of the following questions is based on the following information: Six flats on a floor in two rows facing North and South are allotted to P, Q, R, S, T and U.

Q gets a North facing flat and is not next to S.

S and U get diagonally opposite flats.

R next to U, gets a south facing flat and T gets North facing flat.

If the flats of P and T are interchanged, then who's flat will be next to that of U?

(a)P	(b) Q
(c) R	(d)T
Answer: C	

Explanation:



Hence flat R will be next to U.

Question22 Which of the following combination get south facing flats?

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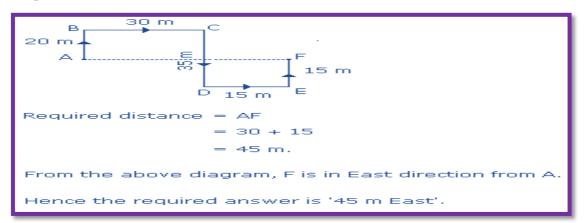
(a)QTS (b) UPT (c) URP (d)Data is inadequate Answer: C Explanation: Hence URP flat combination get south facing flats.

Question23

Rasik walked 20 m towards north. Then he turned right and walks 30 m. Then he turns right and walks 35 m. Then he turns left and walks 15 m. Finally, he turns left and walks 15 m. In which direction and how many meters is he from the Starting position?

(a) 15 m West
(c) 30 m West
Answer: D
Explanation:

(b) 30 m East (d) 45 m East



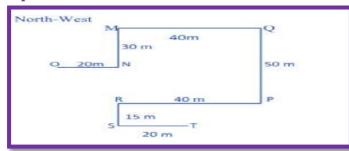
Question 24

Eight persons M through T are standing in such a way that O is 20 m apart from N towards West, N is 30 m South with respect to M. M is 40 m towards West with respect to Q. P is 50 m towards South with respect to Q. R is 15 m apart from S towards North. T is 20 m towards East with respect to S. R is 40 m towards West with respect to P .In which direction is Q standing with respect toR? (a) North-West (b) North

(c) North-East

(d) Cannot be determined

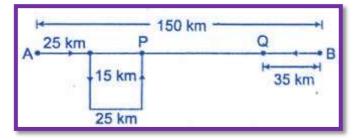
Answer: C **Explanation**:



Question 25

Two buses start from the opposite points of a main road, 150km apart. The first bus runs for 25 km and takes a right turn and then runs for 15km. It then turns left and runs for another 25km and takes the direction back to reach the main road. In the meantime, due to the minor break down the other bus has run only 35km along the main road. What would be the distance between the two buses at this point?

(a)65km (b) 80km (c) 75km (d)85km Answer: A Explanation: Required distance = PQ = 150 - (25 + 25 + 35) = 65km



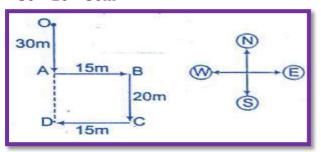
Question 26

Mohan walked 30m towards South, took a left turn and walked 15m. He, then took a right turn and walked 20m. He again took a right turn and walked 15m. How far is he from the starting point?

(b) 50m

(a)95m (c) 70m Answer: B Explanation: Required distance = OD =OA + AD = OA + BC =30 + 20 = 50m

(d)Cannot be determined



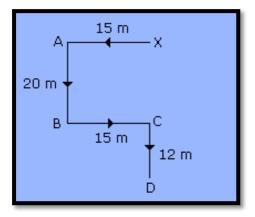
Question 27

Starting from the point X, Jayant walked 15 m towards west. He turned left and walked 20 m. He then turned left and walked 15 m. After this he turned to his right a walked 12 m. How far and in which directions is now Jayant from X?

(a)32 m, South (c) 42 m,North **Answer:**A **Explanation:**

(b) 47 m, East (d)27 m, South

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Question28

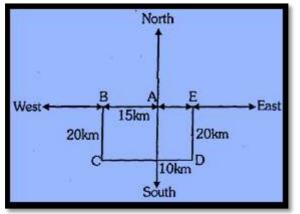
Lakshman went 15 kms to the West of his house, then turned left and walked 20 kms. He then turned East and walked 25 kms and finally turning left covered 20 kms. How far was he from his house?

(b) 20 kms

(d)10 kms

(a)15 kms (c) 25kms **Answer:** b

Explanation:



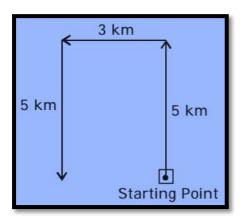
Question 29

A starts from a point and walks 5kms north, then turns left and walks 3kms. Then again turns left and walks 5kms. Point out the direction in which he isgoing. (a)West (b) South

(c) North Answer: D Explanation: (b) South (d)East

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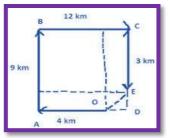


Question 30

A person walks 4 km towards west, then turns to his right to travel 9 km. He turns towards east and travels 12 km. Finally, he travels 3 km towards south. How far is he from the initial position (in km)?

(a) 15	•	-	(b) 23
			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
(c) 18			(d) 10
Answer: d			

Explanation:



From the figure, the distance OE is to be calculated. In triangle ODE, $OE = \sqrt{OD^2} + (DE^2)$ = $\sqrt{(BC - AO)^2 + (AB - CE)^2} OE = \sqrt{(8^2 + 6^2)} = 10$ km.

Question31

One evening before sunset two friends Sumit and Mohit were talking to each other face to face. If Mohit's shadow was exactly to his right side, which direction was Sumit facing?

(a) North

(c)West

(b) south(d) Data in adequate

Answer: B **Explanation:**

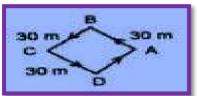
In the evening, sun is in the west and so the shadows fall towards east. Now, since Mohit's shadow fell towards right, therefore, Mohit is facing North. So, Sumit standing face to face with Mohit, was facing South.

Question 32

A girl leaves from her home. She first walks 30 meters in North-west direction and then 30 meters in South-west direction. Next, she walks 30 meters in Southeast direction. Finally, she turns towards her house. In which direction is she moving?

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(a)North-East (c) South-East Answer: a Explanation: (b) North–West (d)South–East



The movements of the girl are as shown in Fig. (A to B, B to C, C to D, D to A). Clearly, she is finally moving in the direction DA i.e. north east.

Question33

A man goes towards East 5km, then he takes a turn to South-West and goes 5km. He again takes a turn towards North-West and goes 5km with respect to the point from where he started, where is he now?

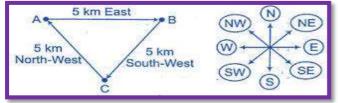
(a)At the starting point

(c) In the East **Answer:** a

(b) In the West (d)In the North East

Explanation:

According to the question, the direction diagram is as follows



It is clear from the diagram that both starting and finishing point are same i.e., the man is at starting point 'A'.

Question 34

Nikhil walked 30m towards East took a left turn and walked 20m. He again took a left turn and walked 30m. How far and in which direction is he from his starting point?

(a)20m,North (c) 20m, South (b) 80m,North (d)80m, South

Answer: a Explanation:

According to the question, the direction diagram is as follows



Required distance = AD =BC =20m So, Nikhil is 20m North from his starting point

Question35

Rakesh is standing at a point. He walks 20m towards the East and further 10m towards the South, then he walks 35m towards the West and further 5 m towards the North, then he walks 15 m towards the East. What is the straight distance (in m) between his starting point and the point where he reached last?

(c) 10

Answer: b

(b) 5 (d)Cannot be determined

Explanation: According to the question. The direction diagram is as follows



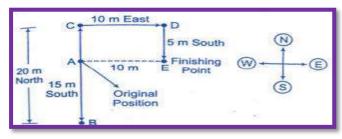
From diagram, AB = 20m BC = HD = 10mED = 5m CD = 35m HE = AF Required distance, AF = HF = HD – ED =10 – 5 = 5m

Question 36

Anoop starts walking towards South. After walking 15m he turns towards North. After walking 20m, he turns towards East and walks 10m. He, then turns towards South and walks 5m. How far is he from his original position in which direction?

(a)10m,North (c) 10m,West Answer: d Explanation: (b) 10m, South (d)10m,East

According to the question, the direction diagram is as follows A = Original position, E = Finishing point



BC =20, AB = 15m, AC = ED = 5m, CD =AE = 10m Clearly, at finishing point E, Anoop is 10 m East from original position A.

Question 37

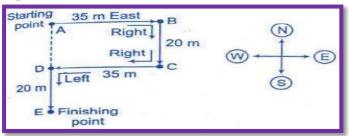
From a point, Rajneesh started walking East and walked 35m. He, then turned on his right and walked 35m. He, then turned on his right and walked 20m and he again turned to right and walked 35m. Finally, he turned his left and walked 20m and reached his destination. Now, how far is he from the starting point? (a)50m (b) 55m

()	
(c)	20m

(b) 55m (d)40m

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Answer: d Explanation:



Rajneesh walked 35 m East. He then turned right i.e. facing South walked 20 m. He again turned right i.e. facing West and moved 35 m. So, now he is 20 m far from the starting point.

He then turned left i.e. facing South and moved 20 m. So, he is in the same line from where he started and 40 m far. Hence, D is the correct option

Question 38

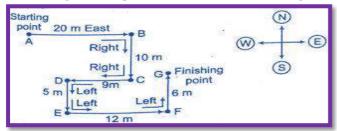
A rat runs 20m towards East and turns to right, then runs 10m and turns to right, runs 9m and again turns to left, runs 5m and then turns to left, runs 12m and finally turns to left and runs 6m. Now, which direction is the rat facing?

-	
(a)East	(b) North
(c) West	(d)South

Answer: b

Explanation:

According to the question, the direction diagram is as follows



Clearly, the rat is facing North at finishing point.

Question 39

Starting from a point S, Mahesh walked 25m towards South. He turned to his left and walked 50m. He, then again turned to his left and walked 25m. He again turned to his left and walked 60m and reached a point T. How far Mahesh is from point S and in which direction?

(b) 25m,North

(d)25m,West

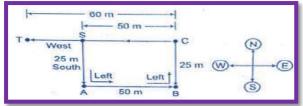
(a)10m,West

(c) 10m,East

Answer: a

Explanation:

According to the question, the direction diagram is as follows



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S = Starting point, T = Finishing point AS = BC = 25mAB = SC = 50m CT = 60mRequired distance, ST = CT - SC = 60 - 50 = 10m clearly, at point T, Mahesh is 10 m West from S.

Question 40

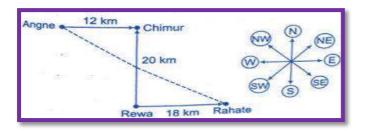
Village Chimur is 20 km to the North of village Rewa. Village Rahate is 18 km to the East of village Rewa. Village Angne is 12 km to the West of Chimur. If Sanjay starts from village Rahate and goes to village Angne, in which direction is he from his starting point?

(a)North (c) South

(b) North-West(d)South-East

Answer: B Explanation:

See the image for locations of various Villages given in the question. If Sanjay starts from Rahate and goes towards Angne, he is clearly moving in North-West direction. option B

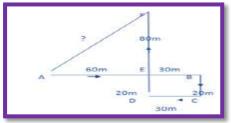


Question 41

A boy is looking for his mother. He went 90 metres in the east before turning to his right. He went 20 metres before turning to his right again to look for his mother at his uncle's place 30 metres from this point. His mother was not there. From here he went 100 metres to his north before meeting his mother in a street. How far did the son meet his mother from the startingpoint?

(a)110m	(b) 100m
(c) 90m	(d)240m
Answer: b	

Explanation:

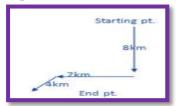


 $\frac{(80)^2 + (60)^2}{\sqrt{6400 + 3600}} = 100$ m.

Question 42

Kashmira facing towards south moved straight 8 km and from there turned to her right 90° and travelled 7 km. Then she took a 45° turn to her left and travelled 4 km. Where would she be now with respect to the startingpoint?

(a)South (c) North-east Answer: b Explanation: (b) South-west (d)South-east

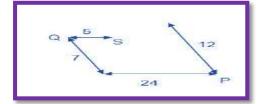


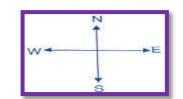
Question 43

Pinky walks 12m towards southeast and stops at point P and then she walks 24m towards west and again she walks 7m towards northwest direction and stops at point Q. Finally, she walks 5m towards east and stops at point S. She is facing which direction from startingpoint?

(a)Northeast (c) East Answer: d Explanation:

(b) Northwest (d)Southwest



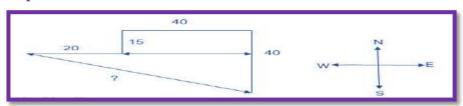


South west

Question 44

A man walks 40m towards north and he turns his left and walked 40m. He then turns his left and walked 15m. He finally turns his right and walked 20m. What is the distance he is from starting point and in whichdirection?

(a)55m,Northwest (c) 65m,Southeast **Answer:** d **Explanation:** (b) 36m,Northeast (d)65m,Northwest



40 + 20 = 60 40 - 15 = 25 $= \sqrt{60^2 + 25^2}$ = 65m, North West

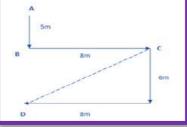
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Question 45

A person starts from point A, walks 5m towards south and reaches point B. He then turns left and walks 8m and reaches point C. He then takes a right turn and walks 6m. He takes a final right turn and walks 8m to reach point D. What is the distance between point C andD?

(a) 13m (c) 10m Answer: c Explanation: (b) 12m (d) 15m

Answer: c Explanation:



Distance between C and D = $\sqrt{(8^2+6^2)} = \sqrt{(64+36)} = \sqrt{100} = 10$ m

Question 46

A car started from point P and moves towards east. After moving a distance of 30m, it took a right turn, again after moving 15m, it took a left turn, and again after moving 10m, he took a right turn. Which direction is the car facingnow?

(a)North (c) West Answer: b Explanation: (b) South(d)North-west

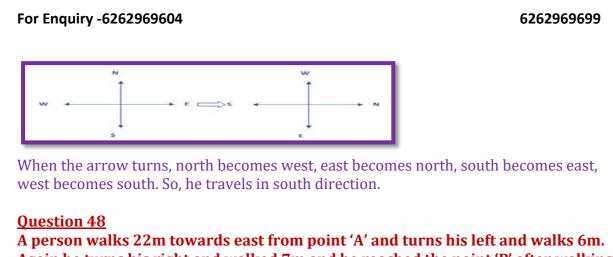


The car is facing the south direction.

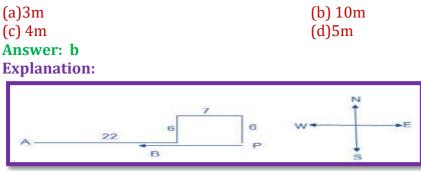
Question47

A directional post is erected on a crossing, in an accident it was turned in such a way that the arrow which was first showing east is now showing north. A passerby went in a wrong direction thinking it is east. In which direction is he actually travellingnow?

(a)North (c) West Answer: d Explanation: (b) East (d)South



A person walks 22m towards east from point 'A' and turns his left and walks 6m. Again he turns his right and walked 7m and he reached the point 'P' after walking 6m towards his right. Finally he turns right and stop at point 'B' after walking 19m towards west from point P. What is the distance to reach the starting point from PointB?



The distance to reach the starting point from PointB is 10m.

Question49

A man started walking from point A and walk towards north and stops at point B. Now he takes a right turn followed by left turn and stops at point C. He finally takes a left turn and stops at point D. Towards which direction the man has to walk from D to B, if he walks 10m before turning eachturn?

- (a) South
- (c) East

(b) North (d) West

Answer: a

Explanation:



Question 50

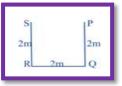
Read the following information carefully and answer the questions given below it: i. M?N means N is to the right of M at a distance of two meter. ii. M*N means N is to the North of M at a distance of two meter. iii.M+N means N is to the left of M at a distance of two meter. iv.M%N means N is to the South of M at a distance of two meter. v. In each of the following questions all persons face North. <u>Que.</u> If P%Q+R*S then S is in which direction with respect toP?

(a)South-east	
(c) North	

(b) East. (d)West

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Answer: d Explanation:



Question 51

Nakul starts walking from his office towards his house. He starts from the front gate of his office and walks 5 km, then turns left and walks 2 km, then turns left again and walks 4 km, then he turns to his right and walks 3 km, then turns left and walks 1 km and then turns to his left again and walks 4 km, then turns to his right and walks 3 km and thus reaches the front gate of his house. If Nakul's house is facing south, in which direction did he startwalking?

lm

3m

411

Office -

(a)East
(c) South
Answer: a
Explanation :

House

10m

3m

(b	JWest
(d)North

4m 5m

2m

PAST EXAMINATION QUESTIONS:

<u>MAY 2018</u>

Question1

Laxman went 15. Kms to North then he turned West and covered Kms. Then he turned South and covered 5 Kms, finally turning to East he covered 10 Kms. In which direction in which he is now moving?

(a)East

(c) North

Answer: c

Explanation:

(b) West (d)South

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5 Km 10 Km 15 Km 15 Km 10 Km 15 Km	
	eft and goes to10 meter then turns right to the south and from their 5 meter to s original place?
(a)East ((c) West (Answer: b	b)North d)South
Explanation:	E
North direction is he forms his original p <u>Question3</u> X Walks southwards and then turns ri	
direction is he moving now? (a)South (b) North
	d)South-west
Answer: c	
Explanation:	
B A C	W E S
He is moving in west direction.	
	facing the sun. After sometimes, he turned left. At what direction is Raman moving

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how? (a)East	(b) West	
(c) South	(d)North	
Answer: b		
Explanation:		
C B O A Parren	W - E	
Demon is moving a set in Most dives		
Raman is moving now in West direc	ction.	
Question5		
I stand with my right hand extend	ded side-ways towards south. Towards	
which direction will my back be?		
(a)North	(b) West	
(c) East Answer: b	(d) South	
Explanation:		
-	side- ways towards south. Towards west	
direction will my back.	shae ways towards south. Towards west	
, , , , , , , , , , , , , , , , , , ,		
Question6		
	then go to the left. In which direction are you	
now?	(b) West	
(a)North (c) East	(b) West (d)South	
Answer: c	(u)oouu	
Explanation:		
A B C D W	E S	
You are in East direction		
<u>NOV 2018</u>		
Question1 Six flats on a floor in two rows fac	cing North and South are allotted to P, Q, R,	
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S, T and U. If Q gets a North facing f diagonally opposite flat. R next to U facing flat. Whose flat is between Q	J gets a South facing flat and T gets a North		
(a)T	(b) U		
(c) R	(d)P		
Answer: a			
Explanation: $ \begin{array}{c} $			
Flat 'T' is b/w Q & S			
towardsNorth.Afterwalking20met	th after walking 15 meters he turns resheturnstowardsEastandwalks 10 and walks 5 meters. In which direction is		
(a) North	(b) West		
(c) East	(d) South		
Answer: c			
Explanation:			
Ancop 0 Ancop 15m A			
'East direction is he from the original Position'			
and walked straight 2 km. and agai	lked straight 5 km. West, then turned left in turned left and walked straight 7 km. In		
which direction is he from the point			
(a)North-East	(b) South-West (d)North West		
(c) South-East Answer: c	(d)North West		
Explanation:			
Laplanation			

For Enquiry -6262969604		6262969699	
A.	7 K0M 5 K0M	≻ Z 2KM Y	

Question4

Aman started to walk East, after moving a certain distance, he turns to his right. After moving 6 me distance, he turns to his right again. After moving a little he turns now to his left currently, he is going in direction

(b) West

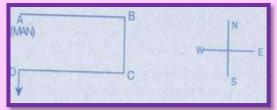
(d)South

(a)North

(c) East

Answer: d

Explanation:



He is going in south direction.

Question5

Manu wants to go to the market. He starts from his house towards North reaches at a crossing after 30m. He turns towards East, goes 10m till the second crossing and turns again, moves towards South straight for 30m where marketing complex exits. In which direction is the market from hishouse?

(a)North	(b) West
(c) East	(d)South

Answer: c

Explanation:

Direction is the market from his house is east.

MAY 2019

Question1

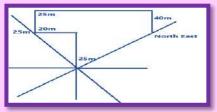
When a person faces north and walk 25 m and she turn left and walk 20m and again turns right and walk 25m, and turns right 25m and turns right and walks 40m in which direction is he now from his starting point.

(a)North – West (c) South – West Answer: b

(b) North – East (d)None

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Explanation:



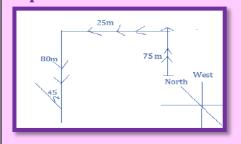
Question2

Madhuri moved a distance of 75 meters toward north. She then turned to the left and walking for about 25m, turned left again and walks 80m, finally she turned to the right at an angle of 45°. In which direction was she moving finally?

(a) South – East

(c) North – west

Answer: c Explanation:



(b) South – West (d) North – East

Question3

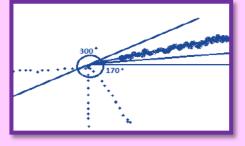
A person facing North 70° clock wise direction moving in clockwise and 300° clock wise direction. Now, in which direction he presently facing.

(a)North-West

(c) North-East

Answer: c

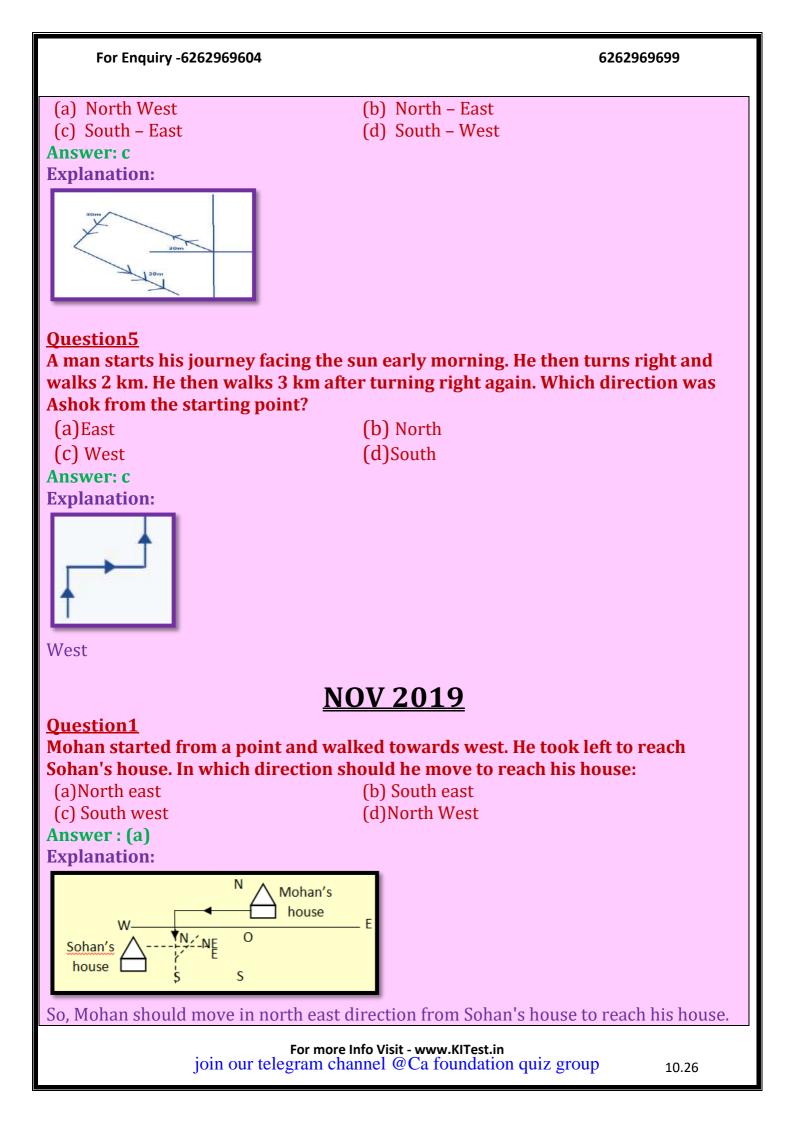
Explanation:



(b) South-East(d)South -West

Question4

Sangeetha leaves from her home. She first walks 30 metres in north – west direction, and then 30 m in south west direction, next she walks 30 metres in south – east direction. Finally, she turns towards her house. In which direction is she moving



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Ouestion2 A man stands on a point and starts walking towards north then turns. Left then turns right and then left in which direction he is moving (a)West (b) North (c) East (d)South Answer: (a)

So, the man is moving in the west direction.

Ouestion3

A man started from a point facing north then turn left and then left then right. In which direction he is facing now?

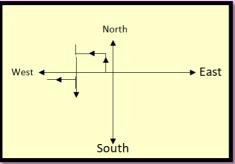
(b) West

(d)South

(a)East (c) North

Answer: (b)

Explanation:



He is facing west.

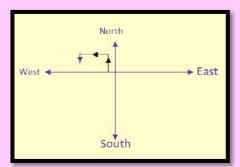
Ouestion4

Rohan driving cycle from house towards north, turn left and left again, which direction he is facing now?

(b) West

(d)South

(a)East (c) North Answer: (b) **Explanation**:



So Rohan is facing towards south.

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Question 5

Sun rises behind the tower and sets behind the railway station. In which direction is the tower from railway station?

(a)North

(c) East

(b) South (d)West

Answer: (c) Explanation:

Since the sun rises behind the tower. So tower is in east direction, railway station is in west direction since sun sets behind it. So tower is in east direction from the railway station.

DEC 2020

Question 1

Rahim faces towards north turning to his right he walks 25 mtrs he then turns to his left and walks 30 mtrs. Next he moves 25 mtrs. To his right he then turns to his right again and walks 55 mtrs. Finally he turns to the right and moves 40 mtrs. In which direction is he now from the starting point?

(a)South – West	
(c) North – West	

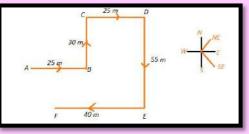
(b) South(d)South – East

Answer: d

Explanation:

Man's movement is as shown in the figure.

: Finally he is in south-east direction with respect to A i.e. starting point.



Question 2

A man can walk by having long, medium and short steps. He can cover 60 meters by 100 long steps, 100 meters by 200 medium steps and 80 meters by 200 short steps. He starts walking by 5,000 long steps, then he turns left and walk by taking 6,000 medium steps. He then turns right and walk by taking 2,500 short steps. How far (in meters) is he away from his starting point?

(a)5,000m (c) 6,000m Answer: d Explanation: (b) 4,000m (d)7,000m

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Square root of 7000 Step-by-step explanation: For 5000 long steps he travelled $\frac{5000}{100} \times 60$ meters then he turned left and take 6000 medium steps and travelled $\frac{6000}{200} \times 100$ meters then he turns right and travelled $\frac{2500}{200} \times 80$ meters by taking 2500 short steps. As we want to calculate distance from stating pointy It we have to consider it as right angled triangle so we get hypotenuse as square root of (4000+3000)

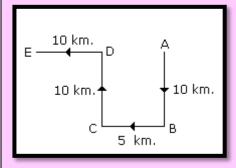
Question3

One day, Ram left home and cycled 10km southwards, then he turns right and cycled 5km, then he turns right and cycled 10km and then he turns left and cycled 10 km. How many kilometers will he have to cycle to reach his home straight?

(a)15km (c) 20km Answer: a (b) 10km (d)25km

Explanation:

According to given fig.,
required distance = A+E
= 5+10



Question 4

You are facing north – east and moved forward 10ms and turned left for 7.5 m what is your position?

(a)North from initial(c) East from initial

(b) South from initial(d)None

Answer: a

Explanation:

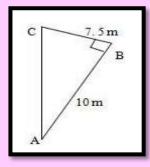
Clearly, The narrator starts from A, moves towards north – east a distance of 10m, upto B, turns left (90o anti clockwise) and moves 7.5 m upto C Clearly, C lies to the north of A Also Δ ABC is right – angles at B

So $AC2 = AB^2 + BC^2 = (10)^2 + (7.5)^2$

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=100+56.25 = 156.25AC= $\sqrt{(156.25)m} = 12.5m$

Thus, the narrator is 12.5m to the north of his initial position.



Question 5

A man is facing west. He turns 45 degrees in the clockwise direction and then another 180 degrees in the same direction and then 270 degrees in the anticlockwise director, which direction is he facing now?

(a)South – West

(c) West

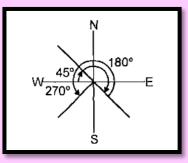
(b) North – West (d)South

Answer: a Explanation:

At starting Man facing West direction.

After turning 45 degree clock wise his direction will be North-West

After turning 180 degree clock wise in same direction his direction will be South-East After turning 270 degree anti clock wise his direction will be South-West



<u>JAN 2021</u>

Question 1

A man is facing west. He turns 45° in the clockwise direction and then another 180° in the same directions and then 270 degrees in the anti-clockwise direction. Which is the facing now?

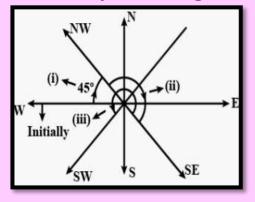
(a) south-West (c) West Answer: a (b) North-West(d) South

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Explanation:

Given

Initially man is facing west Then he turns 45° in clockwise(i) Then 180° in same direction (ii) and again 270 in anticlockwise direction (iii) Strictly according to instruction about the movement of the man, draw the diagram. Hence finally he is facing South West.



Question 2

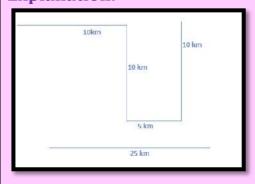
One day, Ram left home and bi-cycled 10km southwards, turned right and travelled 5 km and turned right and went 10 km he turned left and went 10km. how many kilometers has to cycle to reach his home straight?

(b) 15 (d) 25

r	2	2	-
a		Z	5
()	_	~

(c) 20

Answer: b Explanation:



Question 3

Mr. N walks 19 km toward North. From there she walks 6 km towards East. How far and in which direction is she with reference to her starting point?

(a) 4km West(c) 3km East

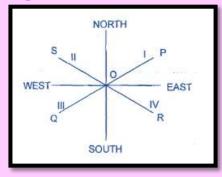
Answer: d

(b) 6km West(d) 3km North/east

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Explanation:



<u>JULY 2021</u>

Question 1

A and B start moving towards each other from two places 200m apart. After walking 60m, B turns left and goes 20m, and then he turns right and goes 40m. He then turns right again and comes back to the road on which he had started walking. If A and B walk with the same speed, what is the distance between them now?

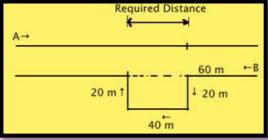
(a) 80 m	(b) 70 m
(c) 40 m	(d) 60 m

Answer: Options (c)

Explanation:

Distance travelled by A on road = 60 + 20 + 40 + 20 = 140 m Distance travelled by B on road = 60 + 40 = 100 m

Required difference = 140 - 100 = 40 m



Question 2

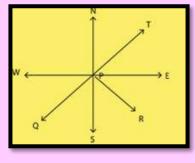
There are four towns P,Q,R and T. Q is to the south-west of P, R is to the east of Q and south-east of P, and T is to the north of R in line with QP. In which direction of P is T located?

(a) North (c) East Answer: Options (b) Explanation: (b) North-East (d) South-East

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Consider a Cartesian plane taking positive X-axis Each negative X-axis as West positive Y – axis as North and negative Y – axis as south.

Let us consider that P is at origin. Hence Q would be in the third quadrant; R would be in fourth quadrant because it is in the south-east of P. Finally T would be in the first quadrant as P, Q, T are on the same line. Hence T would be on North-east of P.



Ouestion 3

Five friends A, B, C, D and E are staying in the same locality. B's house is to the east of A's house and to the north of C's house. C's house is to the west of D's house is in which direction with respect to A's house?

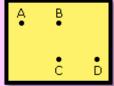
(a) North-East

(c) North-West

Answer: Options (b)

(b) South-East (d) South-West

Explanation:

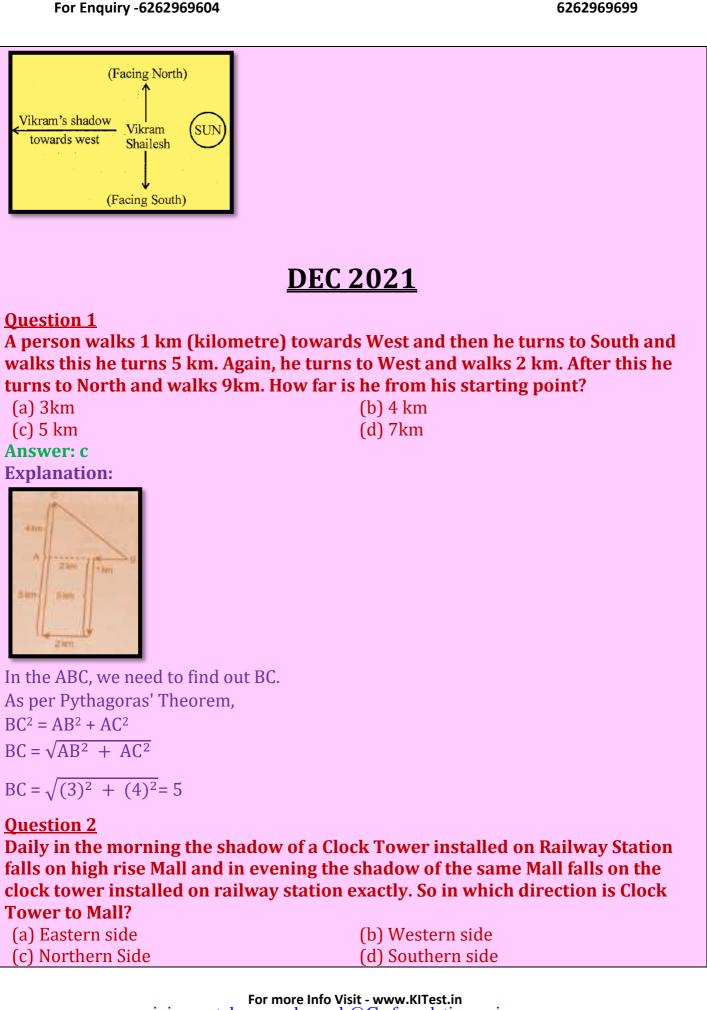


Therefore, D's house is in the South-East direction of A.

Ouestion 4

One morning, after sunrise, Vikram and Shailesh were standing in lawn with their backs towards each other. Vikram's shadow fell exactly towards left hand side. Which direction was Shailesh facing?

(a) South-West (b) West (c) South (d) East-South **Answer: Options (c) Explanation**: Sun rises in the East in morning Therefore, Shailesh was facing South direction.



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Answer:

Explanation:

Sun rises in the East. Therefore, in the morning, the shadow of the things located in East will fall towards West and in the evening the shadow of the things located in west will fall towards East.

Here, since the shadow of the clock tower is located on the Eastern side.

Question 3

R's office is 4 km. in East direction from his home and club is 4 km in North direction from his home. On midway from office to club, R starts moving towards his home. In which direction is he facing his back?

(a) South-East

(c) North-East

(b) North-West(d) South-West

Answer: c Explanation:



Clearly, the back of R is towards North-East.

Question 4

A man starts from a point, walks 4 miles towards North and turns left and walks 6 miles, turns right and walks for 3 miles and again turns right and walks 4 miles and takes rest for 30 minutes. He gets up and walks straight 2 miles in the same direction and turns right and walks one mile. What is the direction he is facing?

(a)) North	
(c)	South	

Answer: b

Explanation:



Therefore, he is facing South direction.

Question 5 The hour hand of a clock is in west direction when time is 3'0 clock. What is the

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(b) South- East (d) West

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direction of minutes hand when time is 6:45?(a) East(b) West(c) North(d) SouthAnswer: a

Explanation:

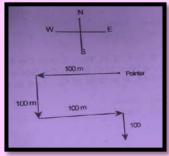


<u>JUNE 2022</u>

Question 1

A sign board pointing direction towards north due to heavy wind. The points of sign words shows west instead of North. If a person moves to same direction of pointer. He moves 100 meter than turn left, and moves 100 meter than again turn left and move 100 meter than he turn right & moves 100 meter. In which direction he is now?

(a) West (c) North Answer: Options (d) Explanation:



(d) South

(b) East

He is south direction from starting point 'Now'

Question 2

If Ramu faces West and moved 5 km in the direction then takes a left turn and moves 10 km then take another left turn and moves 15 km in same direction then moves 10 km in the north direction and reaches point A. What is distance between the starting point and A and in which direction is Ramu facing now?

(a) 10 km, North (c) 10 km, South Answer: Options (a) Explanation:

- (b) 5 km, South
- (d) 5 km, North

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		32.5
	S	
N-	5 km M Start	
10 ion		10 km
		1
OV	15 km	→P

Distance b/w M and A = 15 km - 5 km

Direction \rightarrow (North)

Question 3

If there are 8 polls from A, B, C, D, E, F, G, H. Then B is to the East of A, C is to th South of B, D is to the West of C, E is to the South of D, F is to the East of E, G is South of F, H is West of G. Then in which direction is H in respected to A.

(b) West

(d) East

(a) North

(c) South

Answer: Options (c)

Explanation:



'H' is the South of 'A'

Question 4

One day Ram Left home and cycled 10 km southward, turned right and cycled 5 km and turned right and cycled 10 km and turned left to cycle 10 km. How many kilometres will he have to cycle to reach his home?

(a) 10		
(c) 15		
Answer: Op	otions (c)	
Explanation	n:	
	W E	
A REAL PROPERTY OF A REAL PROPER	A	

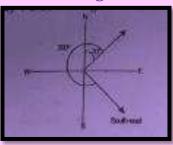
(b) 20 (d) 25

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<u>Question 5</u> A person facing in North moves 70° in clockwise direction. He again moved 300° in ant clockwise direction. In which direction is he facing now?

(a) North - West
(c) North - East
Answer: Options (b)
Explanation:
Person facing south - east

(b) South - East (d) South – West



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Question 1

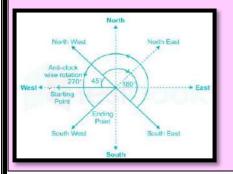
A man is facing west. He turns 45 degree in the clockwise direction and then another 180 degree in the same direction and then 270 degree in the anticlockwise direction Find which direction he is facing now?

a) South-East c) South Answer: Options (d) Explanation: Given: b) Westd) South-West

A man stands facing West. He turns 45° in the clockwise direction and then another 180' in the same direction and then 270° in the anticlockwise direction.

According to the given information, we get the following figure,

Therefore, the man is now facing the South - West direction. Hence, the correct answer is "South - West".

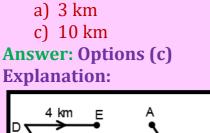


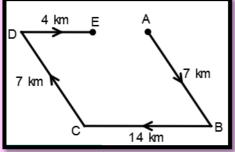
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Question 2

Radha moves towards South-East a distance of 7 km. then she moves towards West and travels a distance of 14 km. From here she moves towards North-West a distance of 7 km and finally she moves a distance of 4km towards east. How far is she now from the starting point?





b) 4 km d) 11 km

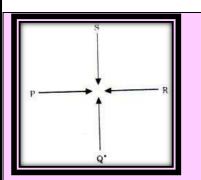
Required Distance

- = AE = 14 - 4
- 14 4
- = 10 km

Question 3

P, Q, R and S are playing a game of carom P, R, and S, Q are playing a game of carom P, R and S, Q are partners. 'S' is to the right of 'R'. If 'R' is facing west, then 'Q' is facing which direction?

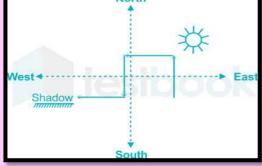
a) South c) East Answer: Options (b) Explanation: Hence option b is correct b) North d) West



Question 4

One morning a boy starts walking in a particular direction for 5 km and then takes a left turn and walks another 5 km thereafter he again takes left turn and walks another 5 km and at last he takes right turn and walks 5 km. Now he sees his shadow in front of him. What direction he did start Intially?





b) North d) East

If he sees his shadow in front of him in the morning, when the sun is in east, he is facing in the west. So as you see in the figure he must start in the direct on the north so that he faces in the direction of his shadow. Hence north is the answer.

Question 5

It is 3' o clock in a watch. If the minute hand points towards the North-East then the hour hand will point towards the

a) South

-]
- c) North-West Answer: Options (d)

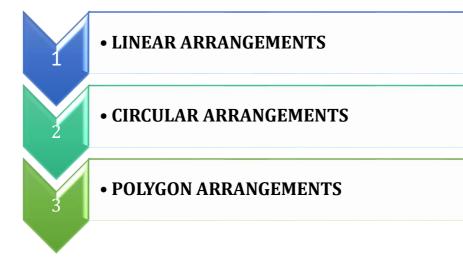
b) South-westd) South-East

Explanation: At 3 O'clock, the hour hand is 90 • ahead of the mi

At 3 O'clock, the hour hand is 90 \circ ahead of the minute hand clockwise. Since the minute hand is towards North-East, so the hour hand points towards South - East.

CHAPTER - 11 SEATING ARRANGEMENTS

VARIOUS PATTERN OF SITTING ARRANGEMENTS



We arrange objects or persons in a line or row. The arrangement is done only on one 'axis' and hence, the position of persons or objects assumes importance in terms of order like positions. In this type of arrangement, we take directions according to our left and right.

LINEAR

ARRANGEMENTS	KANGEMENTSOne Row SequenceWhen direction of face is not clear.				
Two Row SequenceWhen direction of face is clear at every lever to each and every person.					
	Steps to Solve the Linear Arrangements:				
	(a) Identify the nu	umber of objects and their names.			
	(b) Use pictorial method to represent the people or objects and their positions.				
	(<i>i</i>	information with relevant facts and their try to find out the solution.			
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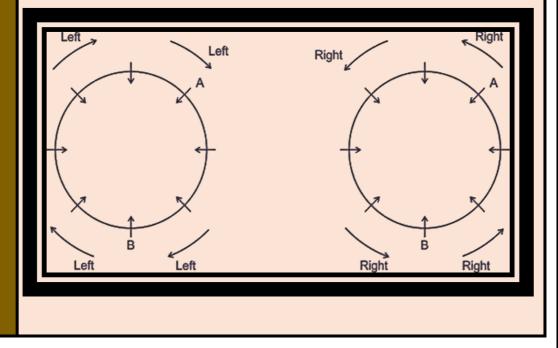
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CIRCULAR ARRANGEMENT

(d) Answer the questions based on the arrangement having made. some persons are sitting around a circle and they are facing the center





Question 1

Four Children's are sitting in arrow. A is occupying seat next to B but not next to C. If C is not sitting next to D? Who is occupying seat next to adjacent to D.?

(a) B

(c) Impossible to tell

(b)B and A (d) A

Answer: D Explanation:

The arrangements as per given information is possible only if C is sitting next to B and D is sitting next to A.

Therefore, two possible arrangements are C, B, A, D, or D, A, B, C Clearly, only A is sitting adjacent to D

Question 2

P, Q, R, S, T, U, V and W are sitting in a row facing North. (A) P is fourth to the right of T

(B) W is Second to the left of S (C) R and U, which are both at the ends, are neighbours of Q and T respectively (D) W is immediate left of P and P is the neighbour of Q who are the immediate neighbours of W? (b) V and R (a) Q and V (c) V and P (d) U and P **Answer: C Explanation**: Person: P, Q, R, S, T, U, V, W **Facing north** P is fourth to right of T T P W is fourth to the left of S S__ W R and U, which are both at the ends are neighbours of Q and T respectively U T _ _ _ P Q R W is immediate left of P and P is neighbour of Q UTS_WPQR UTSVWPQR Hence immediate neighbour of w are V and P Therefore option c is the right answer.

Question 3A, P, R, X, S and Z are sitting in a row. S and Z are in the centre. A and P are at theends. R is sitting to the left of A. Who is to the right of P ?a) Ab) X

~·· /	~,
c) S	d) Z
Answer: B	
Explanation:	

The seating arrangement is as follows:

•	•	•	•	•	•
Р	×	S	Z	R	A

Therefore, right of P is X

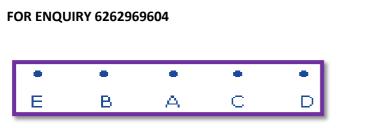
Question 4

A, B,C, D and E are sitting on a bench. A is sitting next to B, C is sitting next to D, D is not sitting with E who is on the left end of the bench. C is on the second position from the right. A is to the right of B and E. A and C are sitting together. In which position A is sitting?

(a) Between B and D (C) Between E and D

(b) Between B and C (d) Between C and E

Answer: B Explanation:



Therefore, A is sitting in between B and C

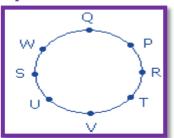
Question 5

P, Q, R, S, T, U, V and W are sitting round the circle and are facing the centre:
P is second to the right of T who is the neighbour of R and V.
S is not the neighbour of P.
V is the neighbour of U.
Q is not between S and W. W is not between U and S
According to this answer bellowed Questions:

5.1 Which two of the following are not neighbours?

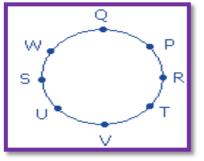
(a) RV	(b) UV
(c) RP	(d) QW

Answer:A Explanation:



5.2. Which one is immediate right to the V?	
(a) P	(b) U
(c) R	(d) T
Answor	

Answer:D Explanation:

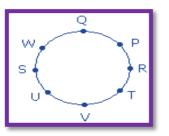


5.3. Which of the following is correct?
(a) P is to the immediate right of Q
(c) Q is to the immediate left of W
Answer: C
Explanation:

(b) R is between U and V (d) U is between W and S 6262969699

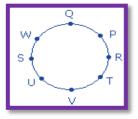
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5.4 What is the position of S? (a) Between U and V (c) To the immediate right of W Answer:C Explanation:

(b) Second to the right of P(d) Data inadequate



Question 6

6.1 Five girls are sitting on a bench to be photographed. Seema is to the left of Rani and to the right of Bindu. Mary is to the right of Rani. Reeta is between Rani and Mary. According to this answer bellowed

Questions:

6.1 Who is (a) Bindu (c) Mary Answer:C Explanatio		mediat	e right to	o Reeta?	(b) Rani (d) Seema	
•	•	•	•	·		
Bindu	Seema	Rani	Reeta	Mary		
Mary is sitting immediate right to Reeta.						
6.2 Who is (a) Bindu (c) Reeta Answer:B Explanatio	(b) Rani (d) Seema					
• Bindu	• Seem	a R	• ani F	• Reeta	Mary	

Rani is in the middle of the photograph.

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6.3 Who is (a) Mary (c) Reeta Answer:C Explanatio	s second from on:	the right?	,	(b) Rani (d)Bind
• Bindu	• Seema	• Rani	• Reeta	• Mary
Reeta is sitting second from the right.				
6.4. Who i (a) Reeta (c) Bindu Answer: D Explanatio		the left in	((p h? b) Mary d) Seema
• Bindu	• Seema	• Rani	• Reeta	• Mary
Seema is si	itting second fr	om the lef	t in photog	raph.

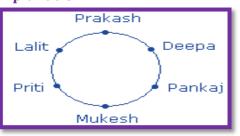
Question 7

Six friends are sitting in a circle and are facing the centre of the circle. Deepa is between Prakash and Pankaj. Priti is between Mukesh and Lalit. Prakash and Mukesh are opposite to each other.

7.1. Who is sitting right to Prakash?

(a) Mukesh (c) Pankaj Answer:D

Explanation:



Hence, Lalit is sitting right to Prakash.

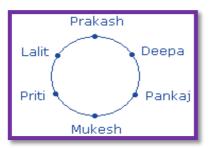
7.2 Who is just right to Pankaj?				
(a) Deepa				
(c) Prakash				
Answer:A				
Explanation:				

(b) Deepa (d) Lalit

(b) Lalit (d)Priti

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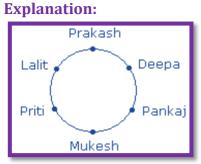


Hence, Deepa is sitting just right to Pankaj.

7.3 Who are the neighbours of Mukesh?

- (a) Prakash and Deepa
- (c) Priti and Pankaj

Answer:C



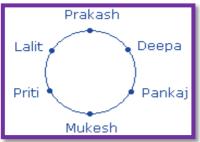
(b) Deepa and Priti (d) Lalit and Priti

Hence, Priti and Pankaj are the neighbours of Mukesh.

7.4 Who is sitting opposite to Priti?

(a) Prakash	(b) Deepa
(c) Pankaj	(d) Lalit

Answer:B Explanation:



Hence, Deepa is sitting opposite to Priti.

Question 8

In an Exhibition seven cars of different companies - Cadillac, Ambassador, Fiat, Maruti, Mercedes, Bedford and Fargo are standing facing to east in the following order : Cadillac is next to right of Fargo. Fargo is fourth to the right of Fiat. Maruti car is between Ambassador and Bedford. Fiat which is third to the left of Ambassador is at one end.

8.1 Which of the cars are on both the sides of Cadillac car?

- (a) Ambassador and Maruti
- (c) Fargo and Mercedes

(b) Maruti and Fiat (d) Ambassador and Fargo

Answer:C



Fargo and Mercedes are on both the sides of cadillac car.

8.2 Which of the following statement is correct?

- (a) Maruti is next left of Ambassador
- (c) Bedford is at one end.
- (b) Bedford is next left of Fiat.
- (d) Fiat is next second to the right of Maruti.

Answer:A

Answer:B Explanation:



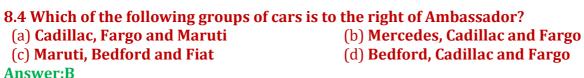
Therefore, Maruti is next left of Ambassador.

8.3 Which one of the following statements is correct?

- (a) Fargo car is in between Ambassador and Fiat
- (c) Fargo is next right of Cadillac.
- (b) Cadillac is next left to Mercedes car.
- (d) Maruti is fourth right of Mercedes

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Therefore, Cadillac is next left to Mercedes car.



Explanation:



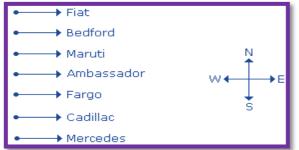
Mercedes, Cadillac and Fargo cars are to the right of Ambassador.

8.5 Which one of the following is the correct position of Mercedes?

- (a) Next to the left of Cadillac
- (c) Between Bedford and Fargo

Answer:D

Explanation:



(b) Next to the left of Bedford(d) Fourth to the right of Maruti.

The correct position of Mercedes is fourth to the right of Maruti.

Question 9

Six friends P, Q, R, S, T and U are sitting around the hexagonal table each at one corner and are facing the center of the hexagonal. P is second to the left of U. Q is neighbor of R and S. T is second to the left of S.

9.1 Which one is sitting opposite to P?

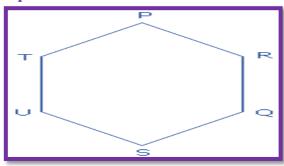
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(a) R (c) Between Bedford and Fargo Answer:D Explanation:

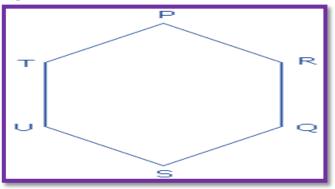


S is sitting opposite to P.

9.2 Who is the fourth person to the left of Q?

(a) P (c) R **Answer:A**

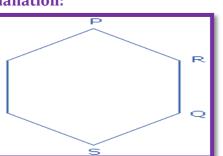
Explanation:



P is the fourth person to the left of Q.

9.3 Which of the following are the neighbours of P?

(a) U and P (c) U and R Answer:B Explanation:



(b) T and R (d) Data inadequate

(b) Q

(b) U

(d) Data inadequate

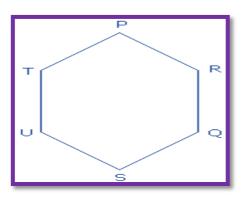
(d) Fourth to the right of Maruti.

T and R are the neighbours of P.

9.4. Which one is sitting opposite to T?

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(a) R (c) Cannot be determined Answer:B Explanation:



Q is sitting opposite to T.

Question 10

Each of these questions are based on the information given below: A ,B, C, D and E are five men sitting in a line facing to south - while M, N, O, P and Q are five ladies sitting in a second line parallel to the first line and are facing to North. B who is just next to the left of D, is opposite to Q. C and N are diagonally opposite to each other. E is opposite to O who is just next right of M. P who is just to the left of Q, is opposite to D. M is at one end of the line

(b) Q

(d) S

10.1 Who is sitting third to the right of O?

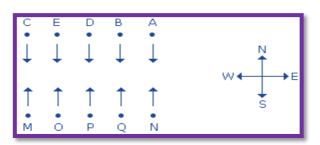
A	(a) Q (c) M nsw Expla		1:			(b) N (d) Data inadequate
	C •	E	Ð	- В •	÷.	
	\downarrow	\downarrow	\downarrow	\downarrow	\downarrow	¥
	•	•	•	•	•	₩ ← → E
						Ś
	M	ō	Ē	ą	Ň	
1	_					

10.2 If B shifts to the place of E, E shifts to the place of Q, and Q shifts to the place of B, then who will be the second to the left of the person opposite to O?

(a) Q	(b) P
(c) E	(d) D
Answer:A	
Explanation:	
Initial arrangement:	



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New arrangement after shifting:

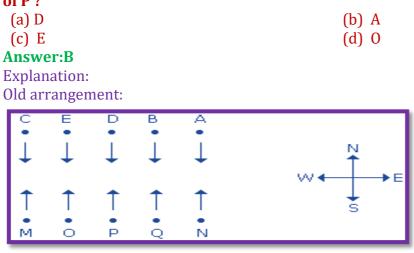
°	₽	⊳	Q	÷
↓	↓	↓	↓	
↑ • M	↑ •	↑ • ₽	↑ • E	↑ • N

B is opposite to O and second person left to B is Q.

10.3. Which of the following pair is diagonally opposite to each other?

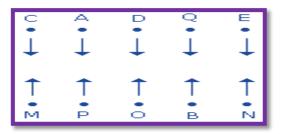
(a) EQ (c) AN Answe Explan) I e r:D	in the r	UIIOWII	ig pan i	(b) BO (d) AM
C •	E	D •	В •	÷	
Ļ	Ļ	Ļ	Ļ	Ļ	
Ť	Ť	Ť	Ť	Ť	W ← → E S
м	ŏ	P	Q	N	

10.4. If O and P, A and E and B and Q interchange their positions, then who will be the second person to the right of the person who is opposite to the person second of the right of P?



New arrangement:

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Question 11

Study the following information carefully and answer the question: Group of girls gossip with each other. All are sitting surrounding a round table. The name of the girls are Shiksha, Radha, Chinu, Snigdha, and Rani. It is not necessary that they are sitting in the order of the name as mentioned here. Radha is Second to the right of Radha. Radha sits near Snigdha

(b) Radha

(d) Snigdha

11.1 Who sits to the left of Shiksha?

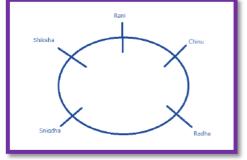
(a) Rani

(c) Chinu

Answer: A

Explanation:

After observation, we can conclude that the sitting arrangement is like this –



So, Rani sits to the left of Shiksha.

11.2 If Radha and Snigdha change their places, then who will be second to the left of Rani?

(a) Radha(c) Shiksha

(b) Snigdha

(d) Nine of the above

(d) None of the above

Answer: B

Explanation

Second to the left of Rani will be Snigdha. Hence, option B is correct.

11.3 How many girls are there in between Shiksha and Chinu if we count anti clockwise?

(b) 2

(a)	1
~ ~	

(c) 3

(0) 5

Answer:B Explanation –

Only two girls are there in between Shiksha and Chinu if we count anti clockwise?

Question 12

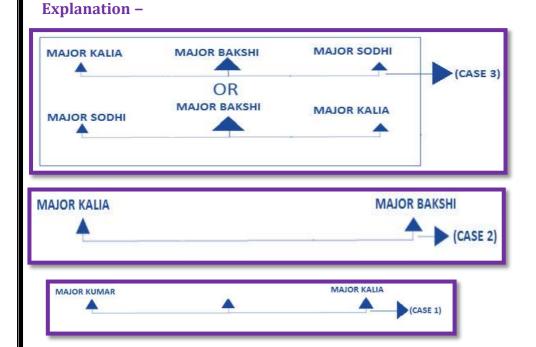
Six army majors are sitting around a circular table and discussing about stopping infiltration across the border. Major Bakshi is sitting between Major Kalia and Major

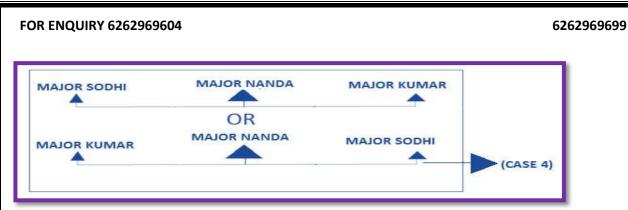
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Sodhi. Major Kalia is sitting immediate left of Major Bakshi. Major Kumar is sitting second to the left of Major Kalia. Major Nanda is sitting between Major Kumar and Major Sodhi.

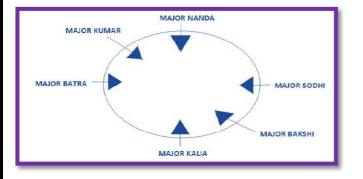
12.1 What is the position of Major Batra?

- (a) Major Batra is sitting between Major Kumar and Major Kalia.
- (c) Major Batra is sitting to the immediate right of Major Kumar Answer:D
- (b) Major Batra is sitting to the left of Major Kalia.
- (d) All the above are true.





By applying (CASE 1), (CASE 2), (CASE 3) and (CASE 4), we get



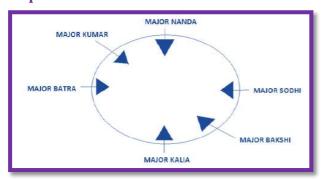
All the options (A),(B) and (C) satisfy our condition. Therefore option (D) is correct.

12.2 Who is sitting to the immediate left of Major Kumar?

(a) Major Bakshi(c) Major Nanda

- (b) Major Batra (d) Major Sodhi

Answer: C Explanation:



According to the diagram -

By observing the diagram, we can clearly say that Major Nanda is sitting to the immediate left of Major Kumar.

12.3 Who is sitting to the immediate right of Major Kalia?

- (a) Major Nanda
- (c) Major Kalia

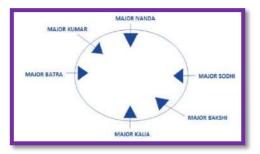
(b) Major Kumar (d) Major Bakshi

Answer: D

Explanation –

According to the diagram –

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By observing the diagram, one can easily conclude that major Bakshi is sitting to the immediate right of Major Kalia.

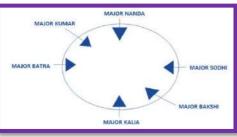
12.4 Which of the following statement is true?

- (a) Major Sodhi is sitting second to the left of Major Bakshi.
- (c) Major Batra is sitting to the left of Major Kalia

Answer:C

Explanation -

According to the diagram -

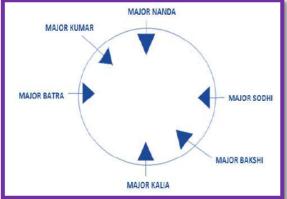


- (b) Major Kalia is sitting between Major Nanda and Major Kumar
- (d) Major Nanda is sitting to the left of Major Kalia.

By observing the diagram, we can conclude that options (A), (B) and (D) do not satisfy the condition. But option (C) does.

12.5 How many Majors are sitting between Major Sodhi and Major Kumar, if counted in clockwise direction?

(a) Six	(b) Two
(c) Three	(d) Five
Answer:C	
Explanation –	
According to the diagram –	



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Major Bakshi, Major Kalia and Major Batra are the three majors sitting between Major Sodhi and Major Kumar.

12.6 What is Major Batra position with respect to Major Sodhi?

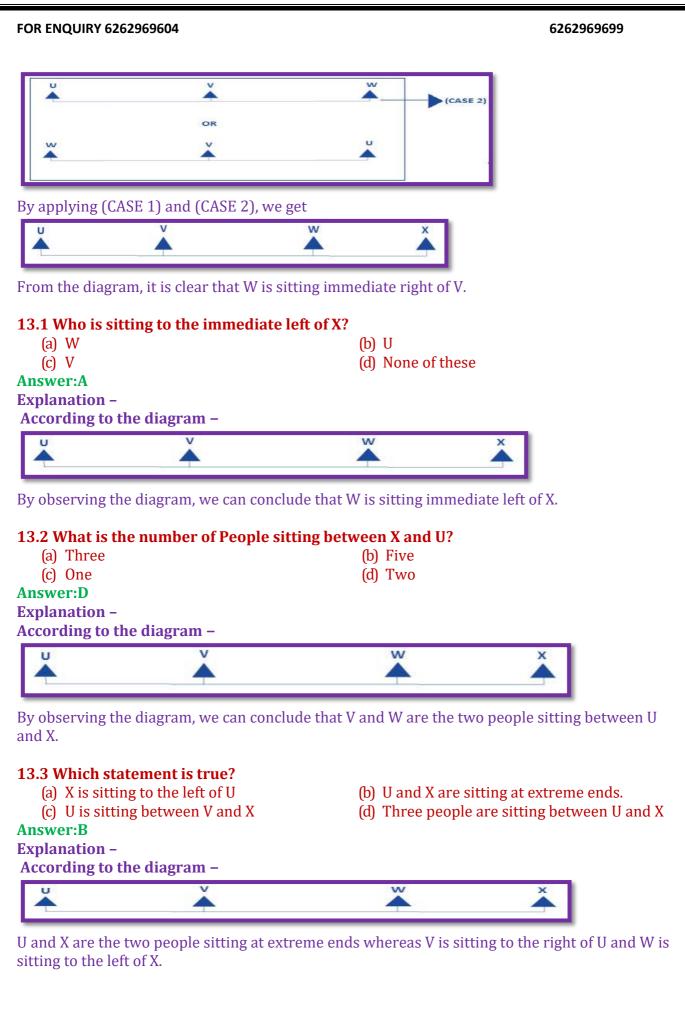
- (a) Second to the left
- (c) Fourth to the Right
- **Answer:D**
- **Explanation**
 - MAJOR NANDA MAJOR KUMAR MAJOR BATRA MAJOR SODHI MAJOR BAKSHI MAJOR KALIA
- (b) Immediate Right.
- According to the diagram -
- (d) Third to the left

By observing the diagram, we can conclude that Major Bakshi is sitting to the immediate left of Major Sodhi. Major Kalia is sitting to the second left of Major Sodhi and Major Batra is sitting third to the left of Major Sodhi. So, our required answer is option (D).

Ouestion 13

Study the given information carefully and answer the following questions. Four friends U, V, W and X are sitting in a row and facing towards north direction. U and X are sitting at two extreme ends. V is sitting between U and W. V is sitting second to the left of X.

	s sitting to the immediate rig			
(a) X		(b) U		
(c) W		(d) None of these		
Answer:C				
Explanation According	to the diagram –			
-		×		
	OR			
*				
×		X (CASE 1)		



FOR ENQUIRY 626296	59604		6262969699
13.4 Which of the second person?	following pairs is th	ne first person sitting to th	ie immediate right of
(a) VW (c) UV		(b) WV (d) None of these	1
Answer:B Explanation – According to the o	liagram –		
4	Ă	w A	×
	-	-	So according to the condition, person, only satisfies in option
13.5 How many period (a) Two (c) One Answer:D Explanation –	ersons are there to t	the right of U? (b) Four (d) Three	
According to the o	liagram –	w	X
Å		<u> </u>	<u> </u>
By observing the d U.	iagram, we can conclu	ude that three-person V, W a	and X are sitting to the right of
Certain number o person's arranger to the right of A. N persons sitting be from F(either left	f people was sitting ments are known. A Jumber of person sit etween A and F. J was or right of F). Numb	tting between A and B was s the neighbor of D who si per of person sitting betwe	the Centre. Some of the eft of B.J was sitting seventh s same as the number of

14.1 What is the position of M with respect toA?

(a) Third to the left(c) Seventh to the right

- (b) Immediate right
- (d) Second to the right

Answer:D

14.2 How many persons were sitting in a circle?

	-	
(a) 07		(b) 08
(c) 16		(d) 19
Answer:D		

14.3. How many known persons were sitting between A and J when counted from left of A? (a) Three (b) Four

(c) Five	(d) Two
Answer:D	
14.4. Who sits second to the right ofB?	
(a) K	(b) F

(c) A	(d)
Answer:A	

14.5 IfC sits exactly between A andKwhencounted from right ofA, then what is the position ofCwithrespecttoD?

J

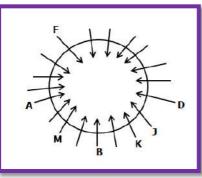
(a) Fifth to the left

Answer: D

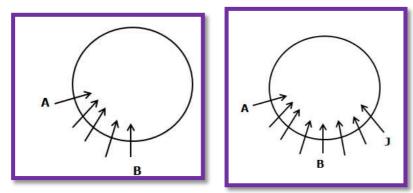
(c) Sixteenth to the right

- (b) Fourteenth to the right
- (d) Either (a) or(b)

Explanation of Question 26 is:

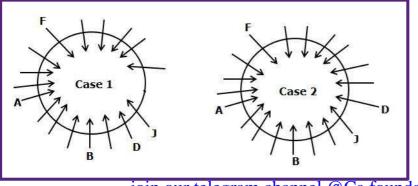


A certain number of people were sitting in a circle facing center. A was sitting fourth to the left ofB

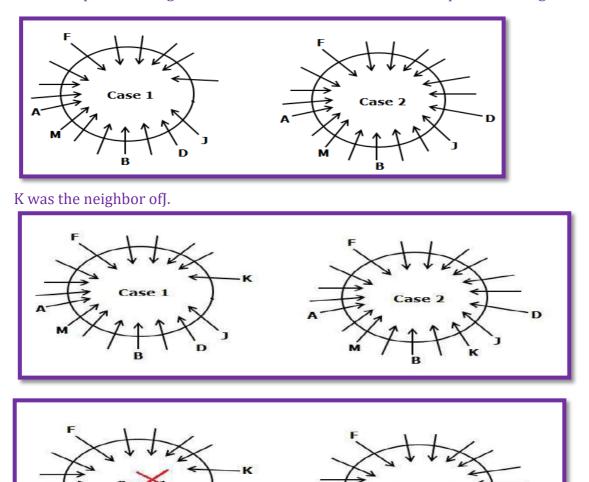


J was sitting seventh to the right of A.

NumberofpersonsittingbetweenAandBwassameasthenumberofpersonssittingbetweenAandF. J was the neighbor of D who sits at the seventh position from F (either left or right of F).



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NumberofpersonsittingbetweenFandMwassameasthenumberofpersonssittingbetweenM and D

MisnottheimmediateneighborofA.Fromthisstatementcase1iseliminatedbecauseMandAare immediateneighbors.

Question 15

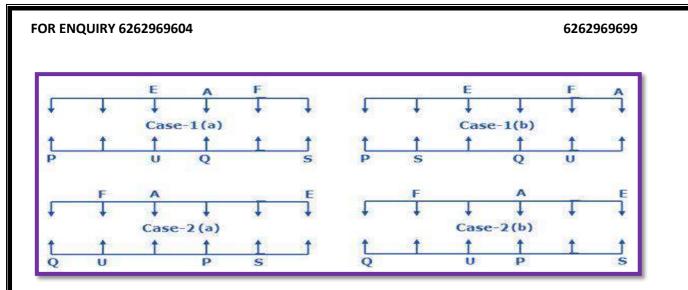
Direction (27.1 to 27.5) twelve persons A, B, C, D, E, F, P, Q, R, S, T and U are sitting in two parallel rows with equidistance from each other. In Row-1, A, B, C, D, E and F are sitting and all of them are facing south and in Row-2, P, Q, R, S, T and U are sitting and all of them are facing north but not necessary in the same order.

E sits second to the left of the one who faces P and either one of them sits at the extreme ends of the rows. Two persons are sitting between P and Q. F faces one of the immediate neighbour of Q. U faces the person the one who sits to the immediate right of A. Two persons are sitting between U and S. As many persons sitting to the right of T is same as the number of persons sitting to the right of C and neither of them sits at the extreme ends of the rows. R is not an immediate neighbour of S. C does not face Q. B sits one of the places to the left of E.

FOR ENQUIRY 6262969604	6262969699
15.1 Who sits diagonally opposite toS?	
(a) B	(b) A
(c) D	(d) F
Answer:C	
15.2How many persons are sitting between T a	and P the one who facesD?
(a) None	(b) One
(c) Two	(d) Three
Answer:D	
15.3 Four of the following five are alike in a cer	rtain way and hence form a group. Which
one of the following that does not belong to the	
(a) Q	(b) P
(c) D	(d) S
Answer: A	
15.4 Which of the following statements istrue?	
(a) Only two persons are sitting to the	(b) U faces E
right of A	
(c) Q sits exactly between T and R	(d) C sits at one of the extreme ends of the row
Answer: B	
15.5	
IfRisrelatedtoAandFisrelatedtoUinacertainway	y.Then,Qisrelatedtowhichofthefollowing?
(a) C	(b) R
(c) E	(d) B
Answer: D	
Explanation:	of the property of the property of the sector $a = -f$
E sits second to the left of the one who faces P and the rows.TwopersonsaresittingbetweenPandQ.Ffa	
	icesoneorenennineuratenerginoorsory.

t	ţ	Ţ	ţ	Ť	1	ţ.	Ť.	Ļ	+	Ţ	Ţ
		Case	-1					Case	-2		
1	1	1	1	t	1	1	1	1	1	t	1
P		1	Q	(58)	20	Q	10	6	Р	0.5	and a

U faces the person the one who sits to the immediate right of A. Two persons are sitting between U and S.



As many persons sitting to the right of T is same as the number of persons sitting to the right of C and neither of them sits at the extreme ends of the rows. R is not an immediate neighbor of S. C does not face 0.

So, Case-1(b), Case-2(a) and Case-2(b) will bedropped.

Case-1(a) (b)

B sits one of the places to the

Question 16

Direction (28.1 to 28.5): Read the following information carefully and answer the questions given below. Eight persons P, Q, R, S, T, U, V and W are sitting in a square table such that four of them are sitting at the corners and remaining are sitting at the middle of each side. The persons who are sitting at the corners are facing towards centre of the table and the persons who are sitting at the middle of the sides are facing away from the centre of the table. R sits third to the left of T, who does not sit at one of the middle side of the table. Only one person sits between R and P (Either from right or left).Q sits second to the left of U and not an immediate neighbour of R. W sits opposite to S, who is not an immediate neighbour of P. More than one persons sit between W and R (Either from left or right)

16.1 Who among the following persons sits third to the right of the one who sits to the immediate left of O?

(a) S	(b) R
(c) Q	(d) P
D	

Answer: B

16.2 How many persons are sitting between P and T, when counted from left of T? (a) Two (b) One

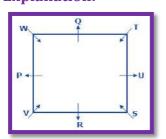
FOR ENQUIRY 6262969604	6262969699
(c) Four Answer: C	(d) Three
16.3 b four of the following one of the following that do	five are alike in a certain way and hence form a group. Which
(a) V	(b) P
(c) U	(d) R
Answer: A	
16.4	
IfRisrelatedtoQandUisrelat	edtoPinacertainway.Then,Visrelatedtowhichofthefollowing?
(a) W	(b) S
(c) R	(d) T
Answer:D	

16.5 Which of the following statements istrue?

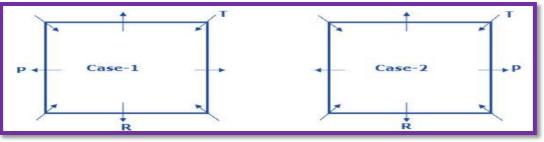
- (a) U sits second to the right of R
- (c) P sits opposite to T

- (b) V sits at one of the corners
- (d) W faces outside from the center

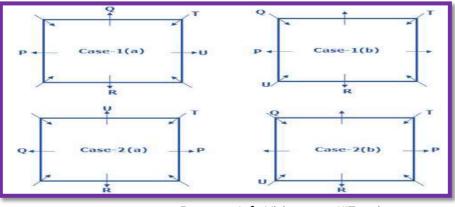
Answer: B Explanation:



R sits third to the left of T, who does not sit at one of the middle of the sides. Only one person sits



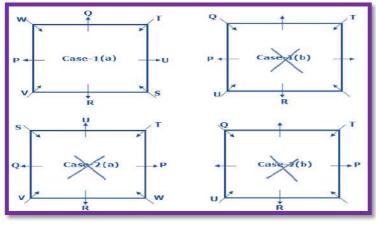
between R and P (Either from right or left). Q sits second to the left of U and not an immediate neighbour of R.



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W sits opposite to S, who is not an immediate neighbour of P.

More than one persons sit between W and R (Either from left or right). So, Case-1(b), Case-2(a) and Case-2(b) will be dropped.



Ouestion 17

Direction (21-25): Read the following information carefully and answer the questions given below.

A certain number of people sitting in the linear row facing north. Only three people sit between A and R. Only four people sit between K and W. Only five people sit between R and K.T sits third to the right of W. Only six people sit between R and Y. Not more than three people sit between K and Y. More than four people are between T and Y. Q sits third to the right of Y. None of them sits between Q and W.J sits eighth to the left of K. Not more than three persons sit between AandJ.

17.1 How many people are sitting in the linearrow?

- (a) Nineteen
- (c) Twenty One

Answer: A

17.2 How many people sits between A and J?

Answer:D	
(c) Ten	(d) One
(a) Seven	(b) Three

17.3 If three people sits between W and H, then which of the following statement is definitely true?

- (a) Three people sit between T and H(c) More than six people sit between Q
 - and H.
- **Answer: D**

17.4 How many people sits between Y and W?

(a) Sixteen (b) Three (c) Ten

Answer: B

(d) Eight

(b) Twenty

(d) Twenty Two

(b) W sits fourth to the right of H.

(d) More than five people sit between Y and H.

17.5 How many people sit to the left of K?

FOR ENQUIRY 6262969604	6	5262969699		
 (a) Ten (c) Sixteen Answer: A Explanation: i). Only three people sit between A 	(b) Eight (d) Thirteen and R.			
Case (ii): YA Case (iii): Y	nd Y. _RR A			
to the right of W. vi).Not more than three people sit	and K. iv).Only four people sit between K and between K and Y _R _T Case (ii)a: YKA	-		
Case (iii)b: W	AR Case (i WRTA _TY K _A Case (iv)a: R _WT Case	R		
(iv)b:RWAK Y does not follow condition (v) vii).More than four people are between T andY. viii).Q sits third to the right of Y. ix).None of them sits between Q and W. x).Not more than three persons sit between A and J. xi).J sits eighth to the left of K. Case (i): ARKYQWT Case (ii) a: YKAWRT = does not follow condition(viii)				
Case (ii)b: WTY K followcondition (vii) Case (iii)a:Y k follow condition(ix) Case (iii)b: W	AR KQWRT _TY K	= does not A does not		
AT does not follow con	A does not followcondition (vii) Case (iv) a: <u>KY</u> ndition(x)			

Question 18

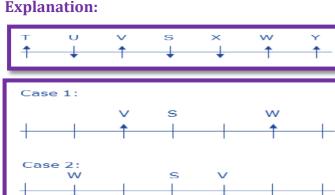
Direction (30.1 to 30.5): Study following information carefully and answer the questions given below.

Seven friends- S, T, U, V, W, X and Y are sitting in a straight line. Some of them facing north and some of them are facing south.

Y faces north. Only two persons sit to the left of V. S sits second to the left of W. Only one person sits between S and

U. X sits third to the left of U. The immediate neighbours of S face the opposite directions. T is not an immediate neighbour of W. The immediate neighbours of U face same the

Allower. A	
18.3 What is the position of V with respect to	oT?
(a) Second to the left	(b) Fourth to the right
(c) Immediate left	(d) Second totheright
Answer: D	
18.4 How many persons face southdirection	s?
a) Two	b) Three
c) Four	d) Five
Answer:B	
18.5 Which of the following statement iscori	rect?
(a) W sits at the extreme ends of the line	(b) T faces south and sits to the immeright of U
(c) Only three person sits between Y and	(d) W faces north and sits second to
the one who sits second to the right	of the one who sits immediate lef
ofT	
Answer: C	
Explanation:	



Only two persons sit to the left of V. Only two persons sit between V and W. S sits second to the left of W. Now we have 2Cases.

The immediate neighbors of S face the oppositedirections.

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(c) Three **Answer: D**

(a) One

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the immediate left of Y.

18.2 Fourofthefollowingfivearealikeincertainwayandthusform a groupasperthegivenarrangement. Which of the following does not belong to that group?

(a) X (c) W

18.1 How many persons sit between Y and T?

Answer: A

18

18

An

18

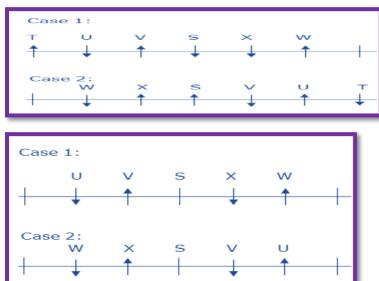
- nediate
- the right ft of T

- (b) T
- (d) Y

(b) Two

(d) None of these

directions. Only two persons sit between V and W. S faces the same direction as U. W sits to



Only one person sits between S and U.

X sits third to the left ofU

T is not an immediate neighbour of W.

The immediate neighbor of U faces same thedirections.

S faces the same direction asU

W sits to the immediate left ofY.

Y faces north.

From the above condition Case 2 wasdropped.

So the final arrangement is:



Question 19

Direction (31.1 to 31.5): Read the following information carefully and answer the questions given below.

Eight persons are sitting in a circular table and all of them are facing away from the center of the table. V sits third to the right of M. Only one person sits between V and N (Either from right or left from V). K sits second to the left of G, who is not an immediate neighbour of M. As many persons are sitting between N and S is same as the number of persons sitting between R and S. T sits to the immediate right of R. T does not sit opposite to K.

19.1 Who among the following sits second to the right ofS?

(a) R	(b) T
(c) N	(d) G
Answer: A	

19.2 How many persons are sitting between G and V, when counted from left ofG?

(a) Three	(b) Four
(c) One	(d) Two
Answer: D	

19.3 Who among the following sits opposite toT?

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(a) V	(b) S
(c) K	(d) G
Answer: D	

19.4 Four of the following five are alike in a certain way and hence form a group. Which one of the following that does not belong to thegroup?

(a) TG	- (t) KM
(c) MN	(0	1) VS
Answer: C		

19.5 If all the persons in the final arrangement are made to sit in the alphabetical order as in the English alphabetical seriesfromGin

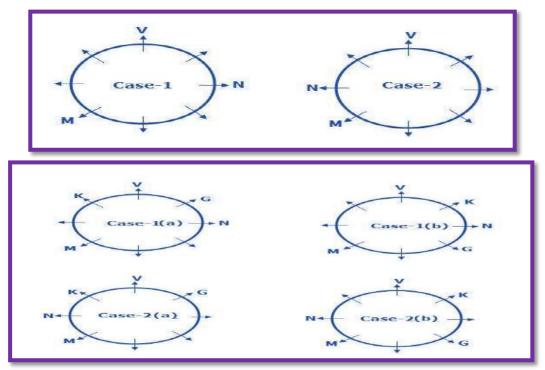
clockwisedirection,thenhowmanyofthemremainstheiroriginalposition(ExcludingG)?

- (a) None (b) One
- (c) Two (d) Three

Answer: B

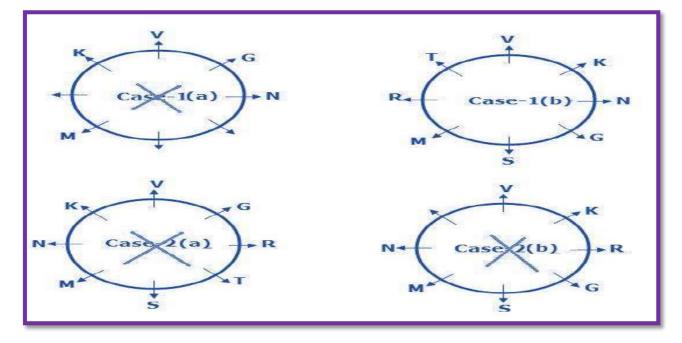
Explanation:

VsitsthirdtotherightofM.OnlyonepersonsitsbetweenVandN(Eitherfromrightorleftfrom V). K sits second to the left of G, who is not an immediate neighbour ofM.



AsmanypersonsaresittingbetweenNandSissameasthenumberofpersonssittingbetweenRand S. T sits to the immediate right of R. So, Case-1(a) and Case-2(b) will bedropped. T does not sit opposite toK.

So, Case-2(a) will bedropped



Question 20

Direction (32.1 to 32.5): study the given information carefully and the answer the following question below.

Ten persons are sitting in a parallel row. In Row 1 A, B, C, D and E are sitting in Row 1 facing north. In Row 2 P, Q, R, S and T are sitting in Row 2 facing south. The person in row 1 exactly faces the person in row 2.

R doesn't sits opposite to C.A sits second from the extreme end. Only one person sits between one who faces A and Q. B is not an immediate neighbour of A and doesn't sits opposite to Q.E sits second to the left of B.T doesn't faces E and never sits at extreme ends. S is not an immediate neighbor of T.C doesn't sits opposite to Q.

20.1

Fourofthefiveamongthefollowingaresimilarinthearrangementtoformagroup,whichoneofth efollowing doesn't belongs to thegroup?

(b) ED

(d) BD

- (a) CA
- (c) SQ

Answer: D

20.2 What is the position of A with respect o B?

- (a) Third to the left
- (c) Second to the left

- . (b) Third to the right
- (d) Immediate left

Answer: A

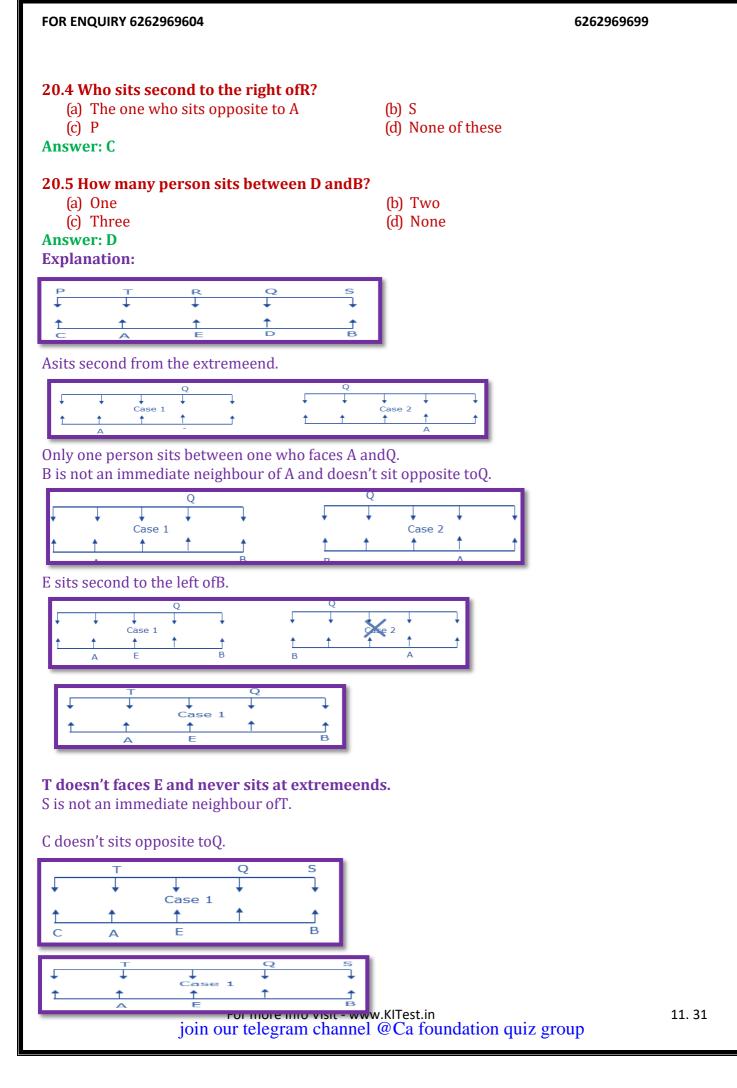
20.3 Which of the following statement is nottrue?

- (a) A sits to the immediate left of E
- (b) The one who sits opposite to D sits second to the left of T

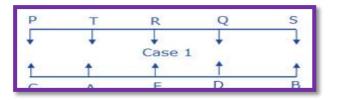
(d) Q is the immediate neighbor of R and S

(c) C and B doesn't sit at the extreme ends

Answer: C



R doesn't sits opposite toC.



Question 21

Direction (33.1 to 33.5): Study following information carefully and answer the questions given below.

Eight friends – Sundar, Satya, Mark, Cook, Putin, Obama, Trump and Nitish are sitting around the circular table facing center, but not necessarily in the same order. Putin and Obama are not immediate neighbours. Only two persons sit between Sundar and Trump. Obama is not an immediate neighbour of Trump and Cook. Putin is not an immediate neighbour of Mark and Trump. Sundar sits second to the left of Cook. Nitish is not an immediate neighbour of Putin. Only three persons sit between Mark and Obama. Satya sits not opposite of Cook. Trump is not an immediate neighbour of Putin.

21.1 What is the position of Cook with respect toPutin?

- (a) Third to the right
- (c) Immediate right

- (b) Second to the right
- (d) Fourth to the right

Answer: C

21.2 How many persons sit between the one who sits the second to the left of cook and Mark, when counted from left of Mark?

(b) Two

(d) No one

- (a) One
- (c) Three

Answer:B

21.3 Which of the following statement iscorrect?

- (a) Cook sits to the immediate left of Trump
- (c) Sundar and Mark is an immediate neighbours
- (b) Only three persons sit between Satya and Sundar
- (d) Only one person sits between Nitish and the one who sits to the immediate left to Sundar

Answer:C

21.4 What is the position of the one who sits second to the left of Sundar with respect to Trump?

- (a) Immediate right
- (c) Second to the right

- (b) Fourth to the right
- (d) Second to the right

Answer:A

21.5 Which of the following statement is correct?

(a) Nitish sits to the immediate left(b) Cook is an immediate neighbour of Satya

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(d) Both a and c

(c) Only two persons sit between Mark and Nitish when counted from left of Nitish

Answer: D

Explanation:



Only two persons sit between Sundar and Trump. Sundar sits second to the left of Cook. Now we have 2cases



Obama is not an immediate neighbour of Trump andCook. Only three persons sit between Mark andObama



Putin is not an immediate neighbour of Mark and Trump. Satya sits not opposite ofCook. Putin and Obama are not immediate neighbours. NitishisnotanimmediateneighbourofPutin.TrumpisnotanimmediateneighbourofPutin. From the above condition Case 1 wasdropped. So the final arrangementis..



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Question 22

Direction (34.1 to 34.5): Read the following information carefully and answer the questions given below.

Eight people I, J, K, L, M, N, O and P are sitting in a rectangular table. Only three persons are sitting in the longer side of the rectangle. The people sits at longer side of table faces outside the table, while the people sits at smaller side of the table faces inside the table. All the information is not necessary to be in the same order.

N sits second to the left of M. Only two persons sit between M and P, who is not an immediate neighbour of N. J sits immediate right of L. P sits opposite to I. Neither K nor L is an immediate neighbour of P. J sits second to the right of O and both are facing same direction. J does not sit opposite to O.

22.1 Name the person who sits opposite toJ?

(a) M	(b) O
(c) N	(d) I
swor	

Answer:C

22.2 Who sits second to the left of P?

(a) L	(b) K
(c) J	(d) 0
Answer:B	

22.3 If all the people are made to sit in alphabetical order in clock wise direction from I, then how many of them remains in their original position?

5	0 1
(a) One	(b) Two
(c) Three	(d) More than Three
Answer:A	

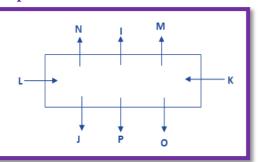
22.4 Name the person who sits second to the right of L?

· · · · · · · · · · · · · · · · · · ·	U
(a) L	(b) K
(c) J	(d) None of these
Answer:D	

Who sits fourth to the left ofJ?

(a) L	(b) M
(c) J	(d) 0
Answer: B	

Explanation:



N sits second to the left of M.

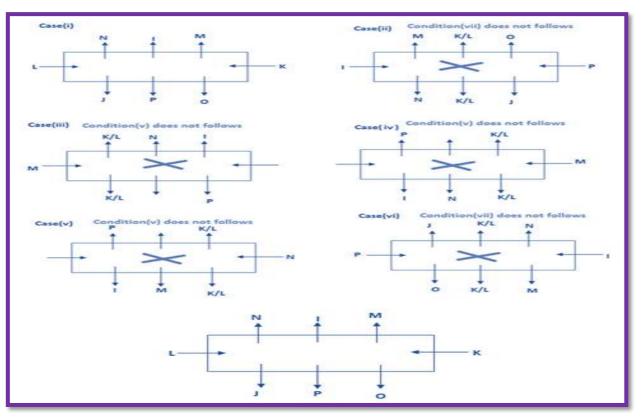
Only two persons sit between M and P, who is not an immediate neighbour of N. iii). P sits opposite toI.

Neither K nor L is an immediate neighbour of P.

J sits second to the right of O and both are facing same direction.

J does not sit opposite toO.

J sits immediate right of L.



Question 23

Direction (35.1 to 35.5): Study the following information carefully to answer the given questions.

Six Students- Sita, Smita, Sunita, Sarita, Sujitha and Sneha lives on a building which has Six Floors with top floor numbered as 6. They got different Ranks from 1 to 6 in a School exam. They are also having different Lucky numbers from 1 to 6. These Six Students are also sitting in a row which has six seats and all are facing north. All students are having unique floor number, Lucky number, and Rank (i.e., No two numbers will be same for a particular student).

Students who sit at extreme ends of the row live neither on the top floor nor on the bottom floor. Sujitha lives on an even numbered floor. Sarita Floor number and Sita Lucky number are same. Two students live between Sita and Smita. Smita sits third to the left of Sujitha. One who lives on top floor sits third to the left of Sneha. A student whose Lucky number is 3 sits third to the right of the student whose lucky number is 5. Sita's Rank is 5. Two students live between Sujitha and Sarita. Smita Lucky number is same as Sita Floor number. Sunita Rank is 6 and she lives on an even numbered floor. Sneha's Rank is same as Sita's Lucky number. Sneha sits second to the right of Smita. Sneha's Lucky number is same as Sarita's Rank. Sujitha Rank is same as Sarita Lucky number.

F	FOR ENQUIRY 6262969604				
	 23.1 Which of the following Pair is sitting at ex (a) Sita and Sneha (c) Sujitha and Smita Answer: D 			e ends? Inita and Sarita Inita and Sujitha	
	23.2 Who among the following is living on Bottom Floor?(a) Sarita(b) Smita(c) Sneha(d) SitaAnswer: A				
	23.3 What is the Lucky number of Sita?(a) One(b) Two(c) Three(d) FourAnswer: A				
	3.4 Who among the (a) Sita (c) Smita nswer: C	following go	t Rank 2? (b) Sn (d) Su		
A	 3.5 Which of the fol (a) Sita lives on top (c) Sujitha Lucky n Answer: D Explanation- 	o floor	(b) Sn	eha's Rank is 1 rita Rank is 3	
	Floor No	Rank	Lucky No	Person	1
	6	5	1	Sita	
	5	1	4	Sneha	
	4	3	2	Sujitha	
	3	2	6	Smita	
	1 2221	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	222	Contract Contract Contract	



5

3

6

4

Question 24

2

1

Direction (36.1 to 36.5): Eight persons – A, B, C, D, E, F, G, and H are sitting in two rows having five seats in each row. In each row, one seat is vacant. Some of them are facing north and some are facing south.

Two persons are sitting between D and B. C sits opposite to D. G sits opposite to E. H sits

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Sunita

Sarita

opposite to the person who is sitting second to the left of F. F is not adjacent to E. Vacant seats are not opposite to each other. A, C and G face the same direction (i.e., All face either North or South). D, B, and E face the same direction (i.e., All face either North or South). C sits second to the right of E. H faces north. C doesn't sit at the extreme end. E sits second to the right of C. E sits to the adjacent left of H.

24.1 How many persons are sitting between A and H?

(a) One	(b) Two
(c) Three	(d) Four
Answer: B	

24.2 Who among the following pair is sitting opposite to vacant seats?

	vito among the io	nowing pair is sitting opposite	
(a)	A and D	(b) B an	d A
(C)	C and F	(d) A an	d F

Answer: D

24.3 Who among the following is facing South?

(a) A	(b) B
(c) F	(d) G
Answer: C	

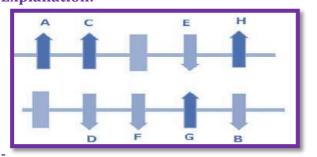
24.4 Which of the following pair is sitting in the same row?

(a) A and D	(b) C and F
(c) E and B	(d) B and F
Answer: D	

24.5 Which of the following statement is false based on above arrangement?

- (a) A faces North
- (c) D sits third to the right of B
- (b) B sits at one of the extreme ends
- (d) Both the vacant seats are at extreme ends

Answer: D Explanation:



Question 25

Study the following information carefully to answer the given questions.

Eight members P, Q, R, S, T, U, V and W of a family are sitting around a rectangular table with all of them facing outwards. Each one of them like different type of music instruments viz. XYLOPHONE, Balafon, Guitar, Piano, VIOLIN, TRUMPET, Accordions and Flute. Three married couples are there in the family.

W is the only sister-in-law of P whereas Q likes TRUMPET and daughter-in-law of RP who is the father of U and uncle of V, sits to the left of the person who likes XYLOPHONE. U is an immediate neighbor of her aunty W who does not sit next to S. R does not like Flute or

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Balafon sits between V and the one who likes TRUMPET sits between the person	sit next to each other. The one who likes the likes VIOLIN. V is third to the left of S. The one who s who like Accordion and Flute Respectively. S's s not liked by V's father. V does not like Guitar or ad sits second to the left of T.
 25.1 Which of the following statements if (a) P is the brother of W (c) Q is the aunty of V Answer: C 	is true regarding the family? (b) R is the father-in-law of P (d) U and V are married couple
25.2 Who among the following sits betw (a) P (c) S Answer: D	een Q and the one who likes Balafon? (b) T (d) V
 25.3 What is the position of the person we TRUMPET? (a) Third to the right (c) Immediate left Answer: D 	who likes Piano with respect to the one who likes (b) Second to the left (d) Third to the left
25.4 Who among the following likes Gui (a) W (c) V Answer: D	tar? (b) U (d) T
 25.5 Which of the following options repr (a) Y, X (c) W, R Answer: B Explanation- 	resent a pair? (b) W, T (d) S, U
S(-) ← → R(+)	P, Accodion S, Xylophone R, Piano
$\begin{array}{c c} & & & \mathbf{P}(+) & & \mathbf{T}(+) \longleftrightarrow \mathbf{W}(-) \\ Q(-) & & & & \\ & & & & \\ & & & & \\ & & & & $	Q, Trumpet V, Flute U, Balafon W, Violin
Question 26 Study the following information carefull Eight players – P, Q, R, S, T, U, V and W si	ly to answer the given questions. t around a square table in such a way that four of

them sit on the four sides while the rest at corners. They play different instruments

namely Xylophone, Balafon, Guitar, Piano, Violin, Trumpet, Accodion and Flute. Some of them are facing the centre while some are facing outside. (i.e away from the centre) Note: Same directions means that if one person facing the centre then the other person also faces the centre and vice versa. Opposite direction means if one person is facing the centre then the other person faces outside and vice versa.

Q faces the centre of the table and does not sit on any corner. V sits on one of the corner between the Flute player and Trumpet player. W sits second to the right of Balafon player who faces the centre.

The Violin player sits third to the left of Q. S sits opposite to W. P sits on the corner exactly opposite to T. The Balafon player sits third to the right of Accodion player. The Xylophone player does not facing the centre.

The Trumpet sits opposite to Q, also faces in opposite direction of Q and sits between Accodion player and Violin player. T who is the Violin player sits immediate right to the Piano player.

The Piano player faces the same direction of the U. The immediate neighbours of Q are facing opposite directions. The Accodion player sits exactly opposite to Guitar player. The one who is on the immediate left of U is facing the same direction as W. R sits third to the left of W.

26.1 Who among the following is a Trumpet player?

(a) P	(b) U
(c) T	(d) Can't be determined
Anoman D	

Answer: B

26.2 R is related to which of the following Instruments?

1	٦.	\mathbf{c}			
12		-1	11	ta	r
la	. I I	u	u	ιu	п.

(c) Accordion

(b) Xylophone

(d) Trumpet

(d) Can't be determined

(b) The person who plays Accodion

Answer: A

26.3 Who among the following sits exactly between R and the Xylophone Player?

- (a) The person who plays Flute
- (c) The person who plays Balafon
- Answer: C

26.4 How many persons sit facing the centre?

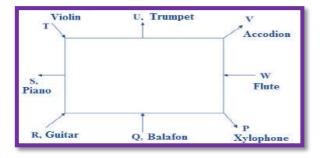
Answer: D	
(c) Two	(d) Four
(a) None	(b) One

26.5 Which of the following pairs are the immediate neighbors of the Flute player?

(a) P, V	(b) P, R
(c) V, R	(d) Q, R
Answer: A	

Explanation-

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Question 27

Study the following information carefully to answer the given questions. There are 16 persons – B,C,D,E,F,G,H,I,P,Q,R,S,T,U,V and W standing in a square plot. Inside a Square plot, a square shaped garden is developed. The persons who are standing inside the garden facing outside. The persons who are standing outside the garden facing inside the centre and likes colours namely viz., – Red, Blue, Black, Brown, Yellow, Green, Violate and Pink. So all the persons standing in the inner square faces the persons standing in the outer Square and likes fruits namely viz., – Apple, Orange, Mango, Grapes, Papaya, Pomegranate, Guava and Banana.

G faces the centre and W faces G. D sits second to the right of G. There are four persons sits between G and E. D is not an immediate neighbour of E. There are three persons standing between I and E. There are two persons standing between I and B. B stands exactly between the E and F. F stands to the immediate left of G. There are two persons standing between W and U. U faces H. T faces outside. There are two persons standing between T and Q. T faces C. Q stands to the immediate left of W. R, the one who faces B stands exactly between the persons P and V. P faces E. The one who sits in the corner of the square likes Red. The one who likes Red sits between the persons who like Black and Blue. The one who likes Blue sits second to the right of the person who likes Green. Three persons sit between one who likes Black and one who likes Green. Two persons sit between one who likes Black and one who likes Yellow. Two persons sit between one who likes Yellow and one who likes Pink. G and F do not like Violate and Yellow respectively. The one who likes Red faces P. The immediate neighbours of P are the one who likes apple and the one who likes Grapes. The one who likes Apple faces the one who likes Black. Three persons sit between the one who likes apple and the one who likes Guava. The immediate neighbours of the person who likes Orange are the one who likes apple and the one who likes Pomegranate. The one who likes Papaya sits exactly behind to the one who likes Orange. The one who likes Banana sits exactly behind to the one who likes Mango. The one who likes Banana faces E.

27.1 In the given arrangement, if three people come and stand to the immediate left of E, how many people will sit between F (From the left of F) and C?

(a) Two	(b) Three
(c) Five	(d) More than four
swor: C	

Answer: C

27.2 Who amongst the following likes Green?

(a) C	(b) B
(c) Other than those given as options	(d) D
Answer:D	

FOR ENQUIRY 6262969604 6262969699 27.3 How many people stand between V and U? (b) Three (a) Two (c) Four (d) More than four **Answer: B** 27.4Four of the following five are alike in a certain way based upon their arrangement and so form a group. Which of the following does not belong to the group? (a) FV (b) UH (c) EP (d) GW **Answer: D** 27.5 Who amongst the following likes Papaya? (a) P (b) U (c) Q (d) E **Answer: B** Blue ERed H ellow Black D TE Brown Violite G **Explanation-**

Question 28

Study the following information carefully to answer the given questions. There are 16 persons – B,C,D,E,F,G,H,I,P,Q,R,S,T,U,V and W standing in a Circular plot. Inside a circular plot, a circularly shaped garden is developed. The persons who are standing inside the garden facing outside. The persons who are standing outside the garden facing inside the centre and lives in a different number of floors. So all the persons standing in the inner circle faces the persons standing in the outer circle and hold a different number of chocolates.

G faces outside and S faces G. D sits immediate right of G. There are four persons sits between G and E. H is not an immediate neighbour of E. There are two persons standing between D and H. H faces R. There are three persons standing between R and U. U stands exactly between the B and F. B faces D. There are two persons standing between P and C. Neither S nor R is an immediate neighbour of P. I stands to the immediate left of H. I faces T. The one who faces F stands exactly between the persons Q and W. W faces P. H stands second to the left of G. B lives on the second floor and sits exactly opposite to the person who lives on the floor which is the square number of the floor of B. F lives on the third floor and stands exactly opposite to the person who lives on the floor which is the square number of the floor of F. P lives on 6th floor and S lives immediately above P. U lives immediately below B. R lives immediately above T. The one who faces P holds chocolates two less than the number of the floor occupied by P. The one who faces U holds chocolates six more than the number of the floor occupied by U. Number of chocolates hold by E is the difference between the number of chocolates hold by D and W. Number of chocolates hold by G is the sum of the number of chocolates hold by D and E also equals to number of

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chocolates hold by V and H. Number ofchocola chocolates hold by H.	tes hold by I is the square of the number of
28.1 In the given arrangement, how many peo	ple will sit between B and T?
(a) Five	(b) Three
(c) Four Answer: B	(d) More than four
Allswer: D	
28.2 Who amongst the following lives on the s	eventh floor?
(a) S	(b) Q
(c) Other than those given as options	(d) U
Answer: A	
28.3 If persons counted from the right of G, the	en how many people stand between G and E
as per the given arrangement?	
(a) Five	(b) Three
(c) Four	(d) Two
Answer: D	
28.4 Four of the following five are alike in a ce	ertain way based upon their seating
arrangement and so form a group. Which of th	• • •
(a) F	(b) E
(c) C	(d) G
Answer: D	
28.5 Who amongst the following have seven cl	nocolates?
(a) T	(b) F
(c) Q	(d) P
Answer: C	
Explanation-	
3 F P 6	
T 4	
E AW I	
$1 U \rightarrow Q \leftarrow \begin{pmatrix} 7 \\ 3 \end{pmatrix} \rightarrow H \leftarrow R$	
$1 U \rightarrow Q \leftarrow (7 \qquad 3) \rightarrow H \leftarrow R$	
XD G VK	
2 B C 9	
5 7	
Question 29 Study the following information carefully to a	now on the given questions

Study the following information carefully to answer the given questions. Ten persons from ten different countries viz. Mumbai, Chennai, Bengaluru, Kolkata, Pune, Hyderabad, Jaipur, Ahmedabad, Surat and Kochi are sitting in two parallel rows containing

five people each, in such a way that there is an equal distance between adjacent persons. In row 1- A, B, C, D and E are seated and some of them are facing South and some of them are facing North. In row 2 – P, Q, R, S and T are seated and some of them are facing South and some of them are facing North. Therefore in the given seating arrangement, each member seated in a row either faces another member of the other row or seated behind each other.(All the information given above does not necessarily represent the order of seating in the final arrangement.). Each person stays in ten different floors numbered 1 to **12.(From Ground floor to Top floor)**

There is only one floor between the person from Mumbai and the person from Pune. S is not from Bengaluru. D is neither from Pune nor from Hyderabad. P sits immediate right of the person from Surat. R sits one of the extreme ends of the line and from Surat. C sits third to the right of the person from Chennai. P does not face A and faces south direction. The person from Mumbai sits exactly between the persons from Kochi and Pune. The person from Hyderabad faces the person from Kochi. The person from Surat stays on the odd numbered floor. T faces North Direction and sits immediate left of Q. Only one person sit between the persons from Bengaluru and Kolkatta. The person from Kolkatta sits to the immediate right of Q, who seated exactly in the middle of the row. P faces one of the immediate neighbors of the person from Chennai. D faces one of the immediate neighbors of the person from Bengaluru. The person from Kochi stays on the top floor. Only One person sits between the person from Surat and Q. C sits to the immediate right of the person who faces S. The person from Hyderabad stays on the 4thfloor. Only two people sit between C and E. S is neither from Mumbai nor from Ahmedabad. The person from Pune sits second to the right of the one who faces North Direction. One of the immediate neighbors of the person from Pune behind the person from Bengaluru. A faces the opposite direction to the person from Jaipur. The persons from Bengaluru, Jaipur and Kolkata stay on the consecutive floors. The floor number of the person from Chennai is the double of the floor number of the person from Surat. The floor number of the B is the square of the floor number of P. Neither E nor A stays on floor numbered 6.

29.1 Who amongst the following faces the person from Hyderabad?

(a) The person from Mumbai	(b) D
(c) The person from Pune	(d) The person from Surat

Answer: B

29.2 T stays on which of the following floors?

(a) 1	(b) 2
(c) 4	(d) 6
Answer: A	

29.3 Which of the following is true regarding C?

- (a) C faces south direction
- (c) C is from Bangladesh

- (b) None of the given options is true

- (d) The person from India faces C

Answer: A

29.4 R is related to Kolkata in the same way as C is related to Pune based on the given arrangement, To who amongst the following is T related to the following same pattern?

(a) Mumbai

(c) Bengaluru **Answer: D**

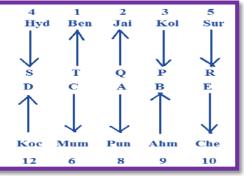
- (b) Sri Nagar
- (d) Hyderabad

29.5 Who amongst the following sit at extreme ends of the row?

- (a) The person stays on 8th floor and R
- (c) D and the person stays on 10th floor
- (b) The persons from Ahmedabad and A
- (d) The persons from Hyderabad and Bengaluru

Answer: C

Explanation-



Question 30

Study the following information carefully to answer the given questions. Ten friends are sitting in two parallel rows of six seats each. One seat is vacant in each row. M, N, O, P and Q are sitting in row-1 facing south. D, E, F, G and H are facing North. Each likes a different Chocolate i.e. 5star, Dairy Milk, Munch, Kitkat, Perk, Snickers, Bourneville, Gems, Eclairs and Galaxy. Each person has different number of their favourite chocolates – 2, 3, 4, 6, 7, 8, 9, 11, 15 and 16.

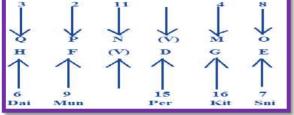
The difference between the chocolates hold by N and O is 3. G sits third to the right of F and likes Kitkat. Only two people sit between E and the vacant seat. E does not like Perk or Munch Chocolate. O is not an immediate neighbour of O. N likes Galaxy. The persons who sit at the extreme end of the line have chocolates in consecutive order. Neither E nor H has 8 chocolate. One of the neighbors of vacant seat in both rows have chocolates in odd number. The one who likes Munch Chocolate faces the one who likes Gems. The one who likes Munch sits opposite to the one who sits third right of the person who sits opposite to G. O is not an immediate neighbour of P. H, who likes neither Perk nor Snickers, does not face the vacant seat. Neither G nor F sits at any of the extreme ends of the row. P faces F. Vacant seats are not opposite to each other. Two seats are there between 0 and N, who sits third right of the one who likes Bourneville. The one who likes Eclairs Chocolate faces the one who likes Kitkat. The persons who like the 5star and Gems are adjacent to each other. Vacant seat of row – 1 is not an immediate neighbour of P. E sits at one of the extreme ends of the row. F does not like 5star and Gems. Vacant seat of row-1 does not face G who doesn't sit at any of the extreme ends of the row. The person who likes 5star has 3 chocolates. The total number of chocolates hold by Q is the half of the total number of chocolates hold by H. The total numbers of chocolates hold by M, F and G is the Square of the total number of chocolates hold by P, Q and M respectively. Neither P nor G has 4 chocolate.

30.1 In the given arrangement, if two people come and sit to the immediate left of E, how many people will sit between D and E?

(a) Two(c) Four

- (b) Three
- (d) More than four

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Answer: B	
30.2 Who amongst the following sits third t	o the right of F?
(a) The one who likes Kitkat	(b) E
(c) Other than those given as options	(d) D
Answer: A	
30.3 Which of the following faces the vacan	t seat of Row – 1?
(a) The one who likes Kitkat	(b) E
(c) Other than those given as options	(d) The one who has 15 chocolate
Answer: D	
 30.4 Four of the following five are alike in a arrangement and so form a group. Which of (a) QE (c) HO Answer: D 	a certain way based upon their seating f the following does not belong to the group? (b) ND (d) FP
20 5 Who among the following has 11 show	lates?
30.5 Who among the following has 11 chocd	
(a) Q (c) D	(b) N (d) F
Answer: B	(d) E
Explanation-	
5st Gem Gal Ecl Bou 3 2 11 4 8	



Question 31

Study the following information carefully to answer the given questions.

Eight friends C, D, E, F, L, M, N and O are seated in a straight line, but not necessarily in the same order. Some of them are facing north while some face South. Only three people sit to the right of M. E sits second to the left of M. F sits third to the right of O. O is not an immediate neighbour of M. O does not sit at any of the extreme ends of the line. Both the immediate neighbours of O face south.

D sits second to the right of N. As many people sit between M and D as between M and L. Immediate neighbours of F face opposite directions(i.e., If one person faces north then the other person faces south and vice-versa). C faces south. L and F face direction opposite to C. (i.e If C faces north then both L and F face south and vice-versa)

31.1 Which of the following is true, based on the given arrangement?

(a) D faces North

- (b) Only three people face South
- (d) O and E face the same directions
- (c) L sits at one of the extreme ends of the line

Answer: D

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31.2 How many people sit to the	left of O?
(a) Two	(b) Three
(c) One	(d) More than four
Answer: C	
31.3 Who amongst the following	faces South?
(a) E	(b) M
(c) F	(d) L
Answer: B	
31.4 Who amongst the following	sits second to the left of L?
(a) 0	(b) F
(c) D	(d) No one as less than two people sit to the
	left of L
Answer: B	
31.5 Who amongst the following	represent the persons sitting at extreme ends of the line?
(a) D, N	(b) C, D
(c) L, N	(d) D, L
Answer: B	
Explanation-	



Question 32

Study the following information carefully to answer the given questions.

Eight people B, C, D, E, F, G, H and I are sitting in a straight line with equal distances between each other, but not necessarily in the same order. Some of them are facing north and some of them are facing south.

E sits immediate right of the person who sits at one of the extreme ends of the line. Only three people sit between E and G. B sits exactly between D and H.

C sits third to the right of H. F is an immediate neighbour of G and faces south. G sits second to the right of C. D sits third to the left of G. B and E face the same direction as C(i.e if C faces north then B and E also face North and Vice-Versa).

Immediate neighbours of G face opposite directions (i.e. if one neighbour faces North then the other neighbour faces south and Vice-Versa)

Person who sit at the extreme ends of the line face opposite directions(i.e. if one neighbour faces North then the other neighbour faces south and Vice-Versa)

D and H face the same direction as I(i.e if I faces north then D and H also face North and Vice-Versa).

32.1 In the given arrangement, how many people will sit between D and G?

- (a) Two
- (c) Four

- (b) Three
- (d) More than four

Answer: A

32.2 Who amongst the following sits third to the right of B?

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(b) I
(d) F
ven arrangement?
(b) Three
(d) More than four
rtain way based upon their seating e following does not belong to the group? (b) EG
(d) EB
reme right end of the row?
(b) C
(d) H
$\mathbf{F} \mathbf{C} \\ \downarrow \downarrow \downarrow \downarrow$

Study the following information carefully to answer the given questions

A group of eight friends – A, C, F, S, X, M, I and W – are sitting in a straight line facing north. Each of them has different company cars– Datsun, Renault, Hyundai, Tata, Maruti, Toyota, BMW and Volkswagen. Each of them likes different colours – Pink, Yellow, Red, Black, Blue, Orange, White and Green, but not necessarily in the same order.

C, who has a Maruti car, sits third to the left of F. Neither C nor F sits at the extreme ends of the line. A, who likes Pink colour, has Hyundai car. A is not an immediate neighbour of either C or F.

S is two places away from M and likes Orange colour. M, who has BMW car, likes Red colour. I, who has Datsun car, sits at an extreme end of the line and likes White colour. X, who has Tata car likes Green colour and sits on the immediate left of C. C does not like either Blue or Yellow colour.

One who has Volkswagen sits on the immediate left of who has Datsun car. F, who has Renault car, does not like Yellow colour.

33.1 The person who likes yellow has which company car?

(a) Datsun	(b) BMW
(c) Toyota	(d) Tata

Answer: C

33.2 What is the position of F with respect to X?

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(a) Fourth to the right(c) Immediate rightAnswer: A	(b) Second to the left(d) Third to the left		
33.3 If A is related to black, W is rela	ated to Blue then M is related with which color ?		
(a) Green (c) White Answer: B	(b) Orange (d) Pink		
33.4 Four of the following five are alike in a certain way based on their position, which one does not belong to that group?			
(a) WFI (c) SMC Answer: D	(b) ACM (d) XCW		
 33.5 Which of the following is correct according to the given information? (a) Two persons sits between W and who likes pink colour (b) X and I are sits at the extreme end of the line (c) X is sit between who has Maruti and Hyundai cars Answer: D 			
Explanation:			
	low Red Blue Orange White W M F S I vota BMW Renault Volkswagen Datsun		

Study the following information carefully to answer the given questions

Ten Stationery items Pencil, Books, Notes, Pens, Sharpners, Chalk, Stickers, Gum, Scale, Covers are placed in 10 boxes numbered 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 are placed adjacent to one another in two different rows of 5 boxes each.

Boxes with odd numbers are situated opposite to the boxes with even numbers and no two even number boxes with even number and no two boxes with odd numbers are adjacent to each other. No two boxes have consecutive numbers.

Box no 8 is occupied by books and it is to the extreme left of one end of the row.

Box 4 and 6 are not in the row of box no 8 and any of the boxes numbered 4, 6, and 3 are not in the middle of the row.

Gums are placed in Box no 5.and its box is not situated in the row where box no 6 is situated. Notes are placed in an odd numbered box and placed in a row where Books are situated but both are not adjacent to each other.

Sharpner's and Chalk's box are adjacent to box no 6 and Chalk's box is not adjacent to box no 4. Pencil's & Cover's box are placed in the same row. Pen's box is even numbered but not 10 and diagonally opposite to box no 1 which contains stickers

Box no 6 is second from the one of the end of the row. Stickers's box is neither opposite to Sharpners's box nor adjacent to it.

34.1 The pack of notes are placed in which number box?

(a) 7

(b) 9

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(c) 8 Answer: A	(d) 3			
34.2 Covers are kept in which nu	ımber box?			
(a) 4	(b) 6			
(c) 3.2	(d) Can	't be determined	l	
Answer: D				
34.3 The number 9 box is placed	opposite to which bo	ox and contains	which station	ery?
(a) 5, Chalk	(b) 6, C	overs		
(c) 8, Pens	(d) 10,	scale		
Answer: D				
 34.4 If pencil is placed in the box which contains pencils? (a) Pencils (c) Stickers Answer: D 	x numbered 4 then wl (b) Cov (d) Gui	vers	ed opposite to	o the box
34.5 If the box 1 is related to Sha with? (a) Scale (c) Chalk Answer: A Explanation:	rpners, box 10 is rela (b) Boo (d) Not	oks	n Box 8 is rela	ated
1[Stickers] 4[Pencil/Cover	rs] 9[Sharpners]	6[Pencil/Covers]	3[Chalk]	
8[Books] 5[Gum]	10[Scale]	7[Notes]	2[Pens]	

Study the following information carefully to answer the given questions

P, Q, R, S, T, U, V and W are eight members of 3 different families who belongs to 3 different cities such as Mumbai, Mysore and Thanae. They go for shopping in 3 different cars A, B and C. Out of 8 members 4 are female. Each member of a family is travelling in a different car. Each car carries at least one male, one female and each family has at least 2 members.

P belongs to Thana and he is travelling in car C. S is wife of T and they are travelling in Car A and B. W is son of Q who is wife of V and they belong to Mysore. R is daughter of U who is wife of P. R is travelling in car B. V is not travelling with U. 35.1 Which of the following group belongs to Mumbai?

35.1 Which of the fol	lowing group belongs to Mumbai?
(a) T,V	(b) S,T
(c) U,W	(d) P,S
Answer: B	

35.2 Which of the following group travelling in Car B?

(a) S,V,P

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(b) R,V,W

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(c) P,Q,R Answer: D

35.3 V belongs to which city?

(a) Mysore

(c) Thanae

Answer: A

35.4 Which of the following is true?

(a) P travelling in Car B

(c) V travelling in Car B

Answer: C

35.5 Which of the following combination is not true?

(a) T – Mumbai – B (c) P – Thanae – C

Answer: D Explanation:

Person	City	Car
Р	Thana	C
Q	Mysore	C
R	Thana	B
S	Mumbai	A
Т	Mumbai	B
U	Thana	A
V	Mysore	B
W	Mysore	A

Question 36

Study the following information carefully to answer the given questions

10 people are sitting in 2 parallel rows containing 5 people each in such a way that there is an equal distance between adjacent persons. In row 1 – A, B, C, D and E are seated facing north and in row 2 – U, V, W, X and Y are seated and facing south. Each person's like different dishes- Dosa, Poori, Chapathi, Idly, Samosa, Pizza, Pongal, Parotta, Briyani and Pasta.

E is sit exactly in the centre of the row and faces the one who likes Idly. Only 1 persons sits between E and the one who likes Samosa. X faces the immediate neighbour of the one who likes Samosa. Only 1 persons sits between U and the one who likes Idly. U is not an immediate neighbour of X. U faces one of the immediate neighbours of C. D is neither an immediate neighbour of C nor faces X.

V is not an immediate neighbour of X and faces the one who likes Poori. D does not face W. D faces one of the immediate neighbours of the one who likes Pizza. Only 1 person sits between the one who likes Pizza and the one who likes Dosa. The one who likes Briyani and the one who likes Parotta face each other. Only 2 people sit between the one who likes Parotta and the one who likes Pongal. A does not like Pongal. The one who likes Pasta sits fourth to the right of the one who likes Briyani.

(d) R,T,V

(b) Mumbai

(d) Either Mumbai or Mysore

(b) R travelling in Car A

(d) T travelling in Car C

(b) W – Mysore – A

(d) W – Mumbai – B

36.1 Which of the following dish does X likes? (a) Pizza(b) Pasta(c) Poori(d) Pongal		
Answer: A		
36.2 Which of the following pairs represents the people sitting at the extreme ends of the row 1?	•	
(a) BE(b) AD(c) AC(d) CBAnswer: B		
36.3 Who among the following likes Briyani?		
(a) X (b) Y (c) V (d) U		
Answer: D		
36.4 Who among the following immediate neighbors of C? (a) BA (b) CE		
(c) AE (d) DE Answer: D		
36.5 Which of the following is correct? (a) A faces V(b) C faces X(c) E faces W(d) D faces U Answer: C		
Y(pasta) X(pizza) W(Idby) V(dosa) U(briyani)		
t <u>t</u> tt		
D(samosa) B(pongal) E(chapathi) C(poori) A(parotta) E faces W		
PAST EXAMINATION QUESTIONS:		
MAY 2018		
Question 1 Five boys A, B, C, D and E are sitting in a row A is to the right of B, and E to the left of B but to the right of A is to the left of D. Who is second from the		
left end? (a) D (b) A (c) E (d) B		
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Answer: C Explanation:

C E B A D E is the second from the left end.

Question 2

Five senior citizens are living in a multistoried building Mr. Muan lives a flat above Mr. Ashokan, Mr. Lokesh in a flat below Mr. Gaurav, Mr. Ashokan lives in a flat below Mr. Gaurav and Mr. Rakesh lives in aflat below Mr. Lokesh. Who lives in the top most flat?

(a) Mr. Lokesh (c) Mr. Manu (b) Mr. Gaurav(d) Mr. Rakesh

Answer: C

Explanation: Mr. Manu lives in the top most flat.

Question 3

Six children A, B, C, D, E and Fare standing in a row. B is between F and D. E is between A and C. A does not stand next to F or D. C does not stand next to D. F is between which of the following pairs of children?

(a) **B** and **E** (c) **B** and **D** (b) B and C(d) B and A

Answer: B Explanation:

A E C F B D F is between B & C

Question 4

Five children are sitting in a row. S is sitting next to P but not T. K is sitting next to R, who is sitting on the extreme left and T is not sitting next to K. Who is/are adjacent to S.

(a) K+P

(c) Only P

Answer: D Explanation:

R K P S T P and T are Adjacent to S (b) R+P (d) P and T

Question 5

Five boys A, B, C, D and E are sitting in a row. A is to the right of Band E is to the left of B but to the right of C. A is to the left of D. Who is second from the

FOR ENQUIRY 6262969604	6262969699
left end?	
(a) D	(b) A
(c) E	(d) B
Answer: C	(u) D
Explanation:	
C E B A D E is second from the left end.	
NOV	2018
Question 1	
-	are sitting in a line. E sits second right
to D. H sits fourth left to D. C and F are	•
immediate neighbor of A. G is not neighbor	-
between A and E. The persons on left	
(a) G and E	(b) B and E
(c) Hand E	(d) G and B
Answer: A	
Explanation:	
GHICFADBE	
The Person on the left end = G	
The Person On the right end = E	
Question 2	
-	ng in a row. B is between F and D. E is
between A and C. However, A does no	ot sit next to F or D. C does not sit next
to D. Then , F is sitting between;	
(a) B and C	(b) E and C
(c) B and D	(d) None of the above
Answer: A	
Explanation:	
A E C F B D	
F is sitting b/w B and C	
Question 3	
	ding in a row. D is on the right of E, B is
C	is next to C on his left. The student in
middle is	
(a) B	(b) E
(c) C	(d) A
Answer: B	
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Explanation:	
A B E C D	
The student in middle is 'E'	
MAY	2019
Question 1	
Five boys A, B, C, D, E are sitting in a row	A is to the right of B and E is to the left
of B but to the right of C. A is to the left o	
(a) D	(b) A
(c) E	(d) B
Answer: C	
Explanation:	
CEBAD	
Question 2	
5 children are sitting in a row. S is sitting	g next to P but not T.K is sitting next to
R.K is sitting on extreme end. T is not sit	ting next to K. Who are sitting adjacent
to S.	
(a) K & P	(b) R & P
(c) Only P	(d) P & T
Answer: D	
Explanation:	
<u>P</u> S <u>T</u> RK	
<u>Ouestion 3</u>	
Four girls are seated for a photograph. S	hikha is left of Reena. Manju is to the
right of Reena. Rita is between Reena an	d Manju. Who is the second left in
photograph?	
(a) Reena	(b) Manju
(c) Rita	(d) Shikha
Answer: C	
Explanation:	
Shikha, Reena, Rita, Manju	
2 nd Left	
Question 4	
Which of the following people are sitting	
(a) OTPQ	(b) OTPR
(c) UNVM	(d) UOTPR
Answer: B	

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Explanation:		
The arrangement of the persons is Q W M V N U S O T P R OTPR are sitting to the right of S.		
<u>NOV 2019</u>		
<u>Question 1</u> Six person are sitting in a circle facing the circler Parikh is between Bablu and		
Narender Ashok is between Chitra and Pankaj. Chitra is immediate left of Bablu.		
Who is immediate right of Bablu?		
(a) Parikh (b) Pankaj		
(c) Narender (d) Chitra Answer: A		
Explanation:		
According to question;		
Ashok		
Chitra Pankaj		
Narender		
Bablu		
Parikh		
So Parikh is immediate right of Bablu.		
Question 2		
C is between A and B. € is at the extreme right D is on the left of		
Who is at the middle?		
(a) A (b) B		
(c) D (d) E Answer: B		
Explanation:		
According to question,		
A <u>C</u> BDE		
So B is in the middle.		
Question 3		
5person are standing in a line one of the 2 persons at the extreme ends is a		
professor and other a business max. An advocate is standing to the right of		
student. An author is to the left of the business man. The student is standing		
between the professor and advocate. Counting from left. The author is at which place?		
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(a) 2 (b) 3	
(c) 4 (d) r	ione
Answer: C	
Explanation:	
According to given ques;	
Professor Student Advocate Author Businessn	nan
Author is 4 th from the left.	
<u>IAN 20</u>	21
Question 1	
A, B, C and D are playing cards. A and B are	partners. D faces towards north. If A
faces west, then who faces south?	
) B
(c) D (d) Data inadequate
Answer: A	
Explanation:	
As per the data D faces North A faces towards	
A and hence towards East So C who will face I) will face towards south.
$B \xrightarrow{C} A \qquad W \xrightarrow{N} E$	
Question 2	
A is seated between D and F at a round tab	e. C is seated opposite to D. E is
round adjust to D. who sis opposite to B?	
(a) A (b) E	
(c) C (d) F	
Answer: a	
Explanation:	
A B B B B B B B B B B B B B B B B B B B	

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Question 3

For Indian A, B, C and D and four Chinese E, F, G and H are sitting in a circle around a table facing the each other in a conference. No two Indians or Chinese are sitting side by side, C who is sitting between G and F is being D, F is between D and A and facing G, H is to the right of B. who is sitting left of A?

(a) E (c) G Answer: a Explanation: (b) F (d) H

Question 4

Five friends A, B, C, D and E are sitting on a bench. A is sitting next to B; C is setting next to D, D is not sitting with E; E is at the left end of bench. C is on second position from the right; A is on the right side of B and to the right side of E. A and C are sitting together. What is the position of B?

(a) Second from right
(c) Extreme left
Answer: d
Explanation:

(b) Centre(d) Second from left

<u>JULY 2021</u>

Question 1

A, B, C, D and E are sitting on a bench. A is sitting next to B, C is on the left end of the bench. C is on the second position from the right. A is to the right of B and E. A I and C are sitting together. In which position A is sitting between?

(b) D and E

(d) B and E

(a) C and D

(c) B and C

Answer: Options (c)

Explanation:

Between B and C

EBAC D

. . .

Therefore, A is sitting in between B and C.

Question 2

Five girls are sitting on a bench to be photographed. Seema is to the left of Rani and to the right of Bindu. Mary is to the right of Rani. Reeta is between Rani and Mary. Who is sitting immediate right to Reeta?

· · · · · · · · · · · · · · · · · · ·	 	
(a) Seema		(b) Rani
(c) Bindu		(d) Mary

Answer: Options (d)

Explanation

We are given that five girls are sitting on a bench to be photographed. Seema is to the left of Rani and to the right of Bindu. So, sequence (Facing towards photographer): Rani, Seema , Bindu So, Seema is to the left of Rani and to the right of Bindu. Now we are given that Mary is to the right of rani Sequence: Mary, Rani, Seema, Bindu Now we are given that reeta is between rani and Mary So, Sequence: Mary, Reeta, Rani, Seema, Bindu Now we are asked who is sitting immediate right to reeta **Ans:** Mary is sitting immediate right to Reeta.

Question 3

Six friends P, Q, R, S, T and U are sitting around the hexagonal table each at one corner and are facing the centre of the hexagonal. P is second to the left of U. Q is neighbour of R and S. T is second to the left of S. Which one is sitting opposite to S?

10 5:	
(a) R	(b) P
(c) Q	(d) T
Answer: Options (b)	
Explanation:	
S is sitting opposite to P	
Step-by-step explanation:	
Let mark corners	
1 2 3 4 5 6 clock wise	
P is second to the left of u	
Assume P is at 1 then U would be at 3	
Q is a neighbour of R and S	
=> Q, must be at 5 & R & S would be at 2 & 4	1
Hence at reaming position 2 would be T	
T is second to the left of S	
=> S will be at 4	
P is at 1 so opposite is 4 - S	
S is sitting opposite to P	
Question 4	
A, B, C, D, E, F and G are sitting in a row fa	acing North:
1. F is to the immediate right of E	
2 E ic Ath to the right to C	

- 2. E is 4th to the right to G
- 3. C is the neighbour of B and D
- 4. Person who is third to the left of D is at one of ends

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Who are right of D? (a) E and F only (c) E, F and A Answer: Options (c)

(b) G, b and C(d) G and B only

(b) Q and R

(d) Q and P

DEC 2021

Question 1

Six children, named as P Q, R, S, T and U, are sitting iS a row, Q is between U and S, T is between P and R, P dose not sit next to either U or S. R does not sit next to S. So, U is setting between the pairs of children.

(a) Q and T (c) Q and S **Answer: b Explanation:** P T R U Q S

Question 2

Five persons A, B, C, D and E are sitting in a row. A sits left to C and C sits left to B. E sits right to B, D sits in between E and B. Who is sitting in the middle?

(a) B (b) C (c) E (d) D Answer: a

Explanation: A C B D E

Question 3

Four ladies A, B, C and D and four Gentlemen E, F, G and H are sitting in a circle around a table facing each other.

l. No two ladies or gentleman are sitting side by side.

Il. C, who is sitting between G and E, is facing D.

III. F is between D and A facing G.

IV. H is to the right of B.

Who is immediate neighbour of B?

(a) G ar	ıd H
(c) E an	d G

Answer: a

Explanation:

(b) E and F (d) A and B FOR ENQUIRY 6262969604

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Question 4

Persons M, N, O, P, Q, R, S, and T are sitting on a compound wall facing North. O sits fourth left of S; P sits second to the right of S; only two people sit between P and M; N and R are immediate neighbours of each other. N is not an immediate neighbour of M; T is not the neighbour of P. How many persons are seated between M and O?

(b) Two

(d) Four

(a) One

(c) Three

Answer: a

Explanation: T O N R M S Q P

Question 5

In a line, P Is sitting 13th from left. Q is sitting 24th from the right and 3rd left from P. How many people are sitting in the line?

(a) 34	(b) 31
(c) 32	(d) 33

Answer:

Explanation:

Q is sitting 3rd left of P, and Q is the 24th position from the right.

	10th	11th	12th	13th	14th	15th	
	Q						

Since Q is 24th and 3rd left of P, it means Q is on the 10th place from the left. This means that counting the position of Q, there are 24 positions to the right. Therefore, counting from 11th position, there are

23 positions to the right.

Therefore, total number of places = 10 + 23 = 33.

<u>JUNE 2022</u>

Question 1

If six person are sitting in a hexagonal table are P, Q, R, S, T, U each facing the centre. P is seated to opposite to Q who is b/w R & S. P is b/w T and U. T is the left of S. Which of them facing R?

FOR ENQUIRY 6262969604	6262969699
(a) P	(b) Q
(c) U	(d) T
Answer: Options (d)	
Explanation:	
T is the facing of R	
_	
Question 2	
Five boys A, B, C, D, E, are sitting in a row	w. A is the right of B and E is to the left of
B, but to the right of C. A is to left of D. W	/ho is second from the left end?
(a) D	(b) A
(c) E	(d) B
Answer: Options (2)	
Explanation:	
d h i k d	
'E is the second from the left end'	

DEC 2022

Question 1

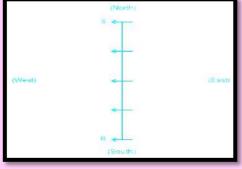
P, Q, R, S and T are sitting in a line facing West. P and Q are sitting together. R is sitting at south end and S is sitting at North end. T is neighbour of Q and R. Who is sitting the middle?

a) P	b) Q
c) R	d) S

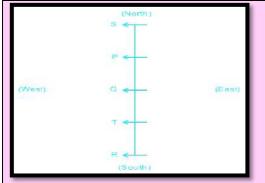
Answer: Options (b)

Explanation:

1) R is sitting at south end and S is sitting at north end.



2) T is neighbour of Q and R. P and Q are sitting together.



Hence, Q is sitting in the middle.

Question 2

Six persons A, B, C, D, E, and F are sitting in two rows with three persons in each row. Both rows are in front of each other. E is not at the end of the any row and D is second left to the F, C is neighbour of E and diagonally opposite to D. If B is neighbour of F who is in front of C then who is sitting diagonally to F?

a) C	b) E	
c) A	d) D	
Answer: Options (b)		
Explanation:		

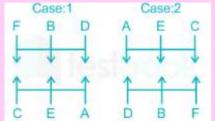
People - A, B, C. D E and F, are sitting in two rows with three people in each row.

1. E is not sitting at any end of any row.

2. D is sitting second to the left of F.

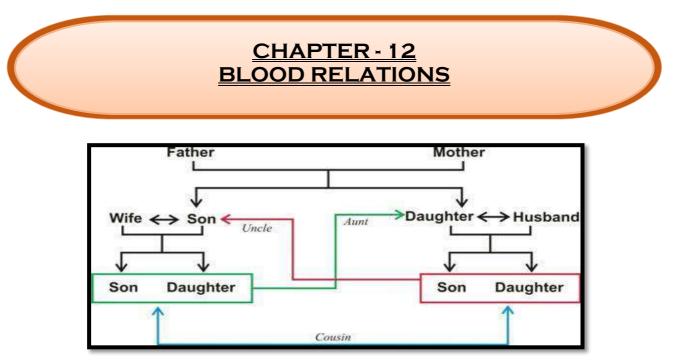
3. C is sitting next to E and diagonally opposite to D.

4. B is sitting next to F.



Clearly, E is sitting opposite to B.

Hence. E is the correct answer.



A person who is related to another by birth rather than by marriage.

Family or Blood Relationship means persons connected by relations like – father-mother, sondaughter, brother-sister, grandfather-grandmother, uncle-aunty, nephew-niece, brother-inlaw, sister-in-law etc. The list can go on and on adding members from father's side and mother's side etc.

S.no	Relationship	Commonly Used Terms
1	Father's son (or) mother's son	Brother
2	Father's daughter (or) mother's daughter	Sister
3	Mother's brother	Uncle (Paternal Uncle)
4	Father's brother	Uncle (Maternal Uncle)
5	Mother's sister	Aunt (Paternal Aunt)
6	Father's sister	Aunt (Maternal Aunt)
7	Son's wife	Daughter-in-law
8	Daughter's husband	Son-in-law
9	Sister's husband	Brother-in-law
10	Husband's brother (or) wife's brother	Brother-in-law
11	Brother's wife	Sister-in-law
12	Husband's sister (or) wife's sister	Sister-in-law
13	Husband's father (or) wife's father	Father-in-law
14	Husband's mother (or) wife's mother	Mother-in-law
15	Brother's son (or) sister's son	Nephew
16	Brother's daughter (or) Sister's	Niece
17	Uncle's daughter (or) Aunt's daughter	Cousin
18	Uncle's Grand son (or) Aunt's Grand son	Nephew
19	Father's father (or) mother's father	Grandfather
20	Father's mother (or) mother's mother	Grandmother
21	Father of Grandfather or Father of grandmother	Great Grandmother
22	Father of Grandfather (or) father of grandmother	Great Grandfather

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Pointing to a photograph of a boy Shinzo said, "He is the son of the only son of my mother." How is Shinzo related to that boy?

(a) Father

(c) Uncle

(b) Brother (d) Cousin

Answer: a **Explanation**:

The boy in the photograph is the only son of the son of Shinzo's mother i.e., the son of Shinzo. Hence, Shinzo is the father of boy.

Question 2

If A + B means A is the mother of B; A - B means A is the brother B; A % B means A is the father of B and A x B means A is the sister of B, which of the following shows that P is the maternal uncle of Q?

(a) $Q - N + M \times P$ (c) $P - M + N \times Q$

κΩ

(b) P + S x N - Q (d) Q - S % P

Answer: C

Explanation:

P - $M \rightarrow P$ is the brother of M

M + N \rightarrow M is the mother of N

 $N \ge Q \rightarrow N$ is the sister of Q

Therefore, P is the maternal uncle of Q

Question 3

If A is the brother of B; B is the sister of C; and C is the father of D, how D is related to A?

(a)	Brother
(c)	Nephew

- (b) Sister
- (d) Cannot be determined

Answer: D Explanation:

If D is Male, the answer is Nephew.

If D is Female, the answer is Niece.

As the sex of D is not known, hence, the relation between D and A cannot be determined.

Note: Niece - A daughter of one's brother or sister, or of one's brother-in-law or sister-in-law. Nephew - A son of one's brother or sister, or of one's brother-in-law or sister-in-law

Question 4

If A + B means A is the brother of B; A - B means A is the sister of B and A x B

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(a) M - N x C + F	of the following means that C is the son of M? (b) F - C + N x M	
(c) N + M - F x C Answer: D	(d) M x N - C + F	
Explanation:		
$M \ge N \rightarrow M$ is the father of N		
N - C \rightarrow N is the sister of C		
and $C + F \rightarrow C$ is the brother of F.		
Hence, M is the father of C or C is the	son of M	
Ouestion 5		
	is the son of the daughter of the father of my he girl?	
(a) Brother	(b) Nephew	
(c) Uncle	(d) Son-in-law	
Answer: A Explanation:		
-	randfather of the boy and daughter of the	
grandfather \rightarrow sister of father		
<u>Juestion 6</u>		
Pointing to a photograph Lata says	s, "He is the son of the only son of my grandfather."	
How is the man in the photograph (a) Brother	(b) Uncle	
(c) Cousin	(d) Data is inadequate	
Answer: A		
Explanation: The man in the photograph is the sor	n of the only son of Lata's grandfather i.e., the man is the	
on of Lata's father. Hence, the man i		
Question 7		
f A + B means A is the brother of E hen which of the following means	3; A x B means A is the son of B; and A % B means B is the day s M is the maternal uncle of N?	u; ht
(a) M + O x N	(b) M % O x N + P	
(c) M + 0 % N	(d) None of these	
Inswer: D Explanation:		
ecause the sex of 0 is not known		
<u>)uestion 8</u> f D is the brother of B, how B is re he statements is/are necessary?	lated to C? To answer this question which of	
The son of D is the grandson of C.		
	12.3	
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<i>j j i</i>		

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B is the sister of D. (a) Only 1 (c) Either 1 or 2	(b) Only 2 (d) 1 and 2 both are required	Only 1 Either 1 pr 2
Answer: D Explanation:		
Given: D is the brother of B.		
From statement 1, we can detect that D	is son of C (son of D is the grandson of C).	
From statement 2, we can detect that B	is 'Female' (sister of D).	
Therefore, B is daughter of C.		
is the wife of B and A x B means A is t shows that M is the maternal grandm		
(a) M x N % S + T (c) M x S - N % T	(b) M x N - S % T (d) M x N x S % T	Only 1 Either 1 pr 2
Answer: A Explanation: $M \ge N \rightarrow M$ is the mother of N $N \% S \rightarrow N$ is the wife of S And $S + T \rightarrow S$ is the father of T. Hence, M is the maternal grandmother of		
Question 10 Pointing to a photograph. Bajpai said my brother." How Bajpai is related to (a) Nephew (c) Father Answer: D Explanation:	, "He is the son of the only daughter of the fa the man in the photograph? (b) Brother (d) Maternal Uncle	ther of
—	ster of Bajpai. Hence, Bajpai is the maternal unc	le of the
	ng with the football is the younger of the two r's wife." How is the boy playing football rela	
(a) Son	(b) Brother	Only 1
(c) Cousin Answer: B	(d) Brother-in-law	Either 1 or 2
Explanation:		
	ghter of the mother means sister and sister's ore, the boy is the brother of Deepak.	
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Question 12 Pointing a photograph X said to his friend Y, "S my mother." How X is related to the person of (a) Daughter (c) Nephew Answer: B Explanation: "The only daughter of the father of X's mother' me	photograph? (b) Son (d) Cannot be decided	Only 1 Either 1 pr 2
Hence X is the son of the lady in the photograph.		
Note: Still have doubt like "How X is a male?"		
Veena who is the sister-in-law of Ashok, is the the father of Sudeep who is the only brother of Ashok? (a) Mother-in-law (c) Wife Answer: D Explanation: Ashok is the only brother of Sudeep and Veena is the wife of Sudeep. Kalyani is the mother-in-law of	f Ashok. How Kalyani is related to (b) Aunt (d) None of these the sister-in-law of Ashok. Hence Veena is	Only 1 Either 1 pr 2
Question 14 If A + B means A is the sister of B; A x B means father of B and A - B means A is the brother of daughter of P? (a) P x Q % R + S - T (c) P x O % P + T - S	B. Which of the following means T is the (b) P x Q % R - T + S	Only 1
(c) P x Q % R + T - S Answer: B	(d) P x Q % R + S + T	Either 1 or 2
Explanation:		
$P \ge Q \rightarrow P$ is the wife of Q		
$Q \% R \rightarrow Q$ is the father of R		
R - T \rightarrow R is the brother of T		
$T + S \rightarrow T$ is the sister of S.		
Therefore, T is the daughter of P.		
<u>Question 15</u> Pointing to a woman, Abhijit said, "Her grandd	laughter is the only daughter of my	

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brother." How is the woman related to Abh (a) Sister (c) Mother-in-law Answer:D Explanation:	i jit? (b) Grandmother (d) Mother	Only 1 Either 1 pr
Daughter of Abhijit's brother \rightarrow niece of Abhiji Abhijit's niece.	it. Thus the granddaughter of the woman is	
Hence, the woman is the mother of Abhijit.		
Question 16 Amit said - "This girl is the wife of the gran related to the girl? (a) Brother	dson of my mother". How is Amit (b) Grandfather	Only 1
(c) Husband Answer:D Explanation: The girl is the wife of grandson of Amit's moth Hence, Amit is the father-in-law of the girl.	(d) Father-in-law	Either 1 pr
<u>Question 17</u> A and B are children of D. Who is the father the statements (1) and (2) is necessary? 1. C is the brother of A and the son of E		
2. F is the mother B. (a) Only (1) (b)Either (1) or (2) Answer: B Explanation:	(c) Only (2) (d) (1) and (2) both	Only 1 Either 1 pr
A and B are children of D.		
From (1), C is the brother B and son of E.		
Since, the sex of D and E are not known. Hence question.	e (1) is not sufficient to answer the	
From (2). F is the mother of B. Hence, F is also	the mother of A. Hence D is the father of A.	
Thus, (2) is sufficient to answer the question.		
Question 18 Pointing towards a man, a woman said, "Hi mother." How is the woman related to the		
(a) Mother (c) Sister Answer:A Explanation:	(b) Grandmother (d) Daughter	Only 1 Either 1 pr
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Only daughter of my mother \rightarrow myself.		
Hence, the woman is the mother of the man.		
<u>Question 19</u> If P \$ Q means P is the brother of Q; P # Q mea daughter of Q in A # B \$ C * D, who is the father		s P is the
(a) D	(b) B	Only 1
(c) C Answer: A	(d) Data is inadequate	Either 1 or 2
Explanation:		
A is the mother of B, B is the brother of C and C is A (Parents) D 	the daughter of D. Hence, D is the fath	ner.
B - is - Brother - of - C		
Question 20 Introducing Sonia, Aamir says, "She is the wife my mother." How Sonia is related to Aamir? (a) Wife (c) Sister-in-law Answer: A	e of only nephew of only brother of (b) Sister (d) Data is inadequate	Only 1 Either 1 pr 2
Explanation:		
Brother of mother means maternal uncle. Hence of means Aamir himself. Therefore, Sonia is the wife		le
Question 21 If A + B means A is the brother of B; A % B means means A is the sister of B. Which of the follow: (a) M % N x P (c) M + S % R % P Answer: D Explanation:		Only 1 Either 1 or 2
$M + K \rightarrow M$ is the brother of K		
K % T \rightarrow K is the father of T		
$T \ge P \rightarrow T$ is the sister of P		
Therefore, K is the father of P and M is the uncle	of P.	
<u>Question 22</u> Pointing to Varman, Madhav said, "I am the or	nly son of one of the sons of his	
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father." How is Varman related to Ma (a) Nephew (c) Father or Uncle Answer: C Explanation: Madhav is the only son of one of the son father or uncle of Madhav.	adhav? (b) Uncle (d) Father ns of Varman's father → Either Varman is th	Only 1 Either 1 or
my son." How that woman is related (a) Daughter (c) Wife Answer: D Explanation:	l, "She is the mother of the only daughte to Shashank? (b) Sister-in-law (d) Daughter-in-law s granddaughter. Hence, the woman is the	r of Only 1 Either 1 or
	A x B means B is the husband of A; A - B B means A is the father of B, which of the ne grandmother of T? (b) P x Q % R - T (d) P + Q % R - T	e Only 1 Either 1 or
Q - P \rightarrow Q is the mother of P		
$P + R \rightarrow R$ is the brother of P		
Hence, \rightarrow q is the mother of R		
R % T \rightarrow R is the father of T.		
Hence, Q is the grandmother of T		
Question 25		
A3P means A is the mother of P		
A4P means A is the brother of P		
A9P means A is the husband of P		
A5P means A is the daughter of P Which of the following means that K (a) M9N3K4J (c) K5J9M3N Answer: B Explanation:	is the mother-in-law of M? (b) M9N5K3J (d) K3J9N4M	Only 1 Either 1 oi
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M9N → M is the husband of N N5K → N is the daughter of K Hence, → M is the son-in-law of K K3J → K is the mother of J Hence, → K is a lady Hence, → K is the mother-in-law of M

Question 26

Introducing Neeta, Anil said, 'She is wife of my mother's only son. How is Neeta related to Anil?

(a) Mother

(c) Sister

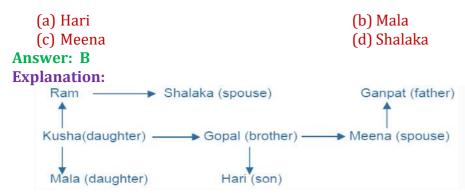
(b) Wife(d) Daughter-in-law

Answer: B Explanation:

Neeta is the wife of Anil's mother's only son, who is Anil himself. Hence, answer is Neeta is Anil's wife. i.e. **(B) Wife.**

Question 27

'Ram' is the father of 'Kusha' but 'Kusha' is not his son. 'Mala' is the daughter of 'Kusha'.' Shalaka' is the spouse of 'Ram'. 'Gopal' is the brother of 'Kusha'. 'Hari' is the son of 'Gopal'. 'Meena' is the spouse of 'Gopal'. 'Ganpat' is the father of 'Meena'. Who is the granddaughter of 'Ram'?



'Mala' is the daughter of 'Kusha' and 'Ram' is the father of 'Kusha'. So, 'Mala' is the granddaughter of 'Ram'. Hence,

Question 28

Pointing to a gentleman, Dinesh said "His only brother is the father of my daughter's father." How is the gentleman related to Dinesh?

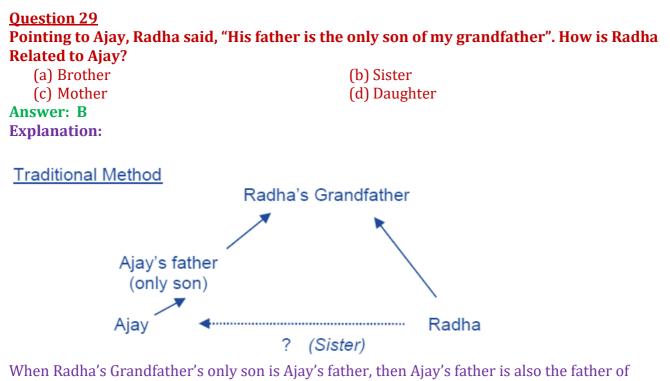
(a) Uncle	(b) Grandfather
(c) Father	(d) Brother- in-law
Answer: A	

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Explanation:

The gentleman's only brother is the father of Dinesh (Dinesh daughter's father is Dinesh himself.). Gentleman is brother of Dinesh's father. Gentleman is Dinesh's uncle. Hence,



Radha. So Radha is Ajay's sister. Hence, **answer is (B) Sister.** We know, 'Only son of my grandfather' means 'my father'. "His father is the only son of my grandfather" thus becomes "His father is my father". So Radha is Ajay's sister. Hence,

Question 30

Lalita said to Tina, "You are the daughter-in-law of the grandmother of my father's only son."How is Lalita related to Tina?

(a) Aunt(b) Sister(c) Mother(d) Indeterminable

Answer: D

Explanation:

'My father's only son' is my (Lalita's) brother. Tina is daughter-in-law of grandmother of (Lalita's) brother. Tina thus can be their mother (wife of grandmother's only son). However, as it is not mentioned that the grandmother has only one son, Tina can be wife of grandmother's other son i.e. Tina could also be their aunt. Hence,

Question 31

Pointing to a photograph, Amar said, "I have no brother or sister but that man's father is my father's son." Whose photograph, was it?

(a) a. His son's

(c) c. His nephew's

(b) b. His father's (d) d. His own

Answer: A

Explanation:

Since Amar has no brother or sister so his father's son is the man himself and so the man who is talking is the father of the man in the photograph i.e. the man in the photograph is his son.

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Hence, answer is (A) His son's.

Question 32

Looking at the portrait of a man, Ashok said, 'His mother is the wife of my father's son. Brothers and sisters I have none'. At whose portrait was Ashok looking?

(a) a. His cousin

(c) c. His uncle

(b) b. His nephew (d) d. His son

(b) Uncle

(d) Father

(b) Brother (d) Uncle

Answer: D

Explanation:

My (Ashok's) father's son will be Ashok himself as he has no brother or sister. Ashok's wife is mother of the person in the portrait. The portrait is thus of Ashok's own son. Hence, **answer is (D) His Son.**

Question 33

Pointing to a photograph of a boy Suresh said, "He is the son of the only son of my mother." How is Suresh related to that boy?

(a) Brother

(c) Cousin

Answer: D

Explanation:

The boy in the photograph is the only son of the son of Suresh's mother i.e., the son of Suresh. Hence, Suresh is the father of boy.

Question 34

When Anuj saw Manish, he recalled, "He is the son of the father of my daughter." Who is Manish?

(a)	Brother-in-law
(0)	Coucin

(c) Cousin

Answer: A

Explanation: Anuj's daughter's mother — Anuj's wife; Anju's wife's father - Anuj's father-in-law; Father-in-law's son — Anuj's brother-in-law So, Manish is Anuj's brother-in-law

Question 35

()

A has 3 children. B is the brother of C and C is the sister of D, E who is the wife of A is the mother of D. There is only one daughter of the husband of E. What is the relation between D and B?

(b) B (d) D

(a) A	
(c) C	
Answer: D	
Explanation:	



With the chart Therefore, D is a boy because there is only one daughter of E.

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Hence, B is the brother of D.

Note: While solving the question (+) can be used for male and (-) can be used for female.

Question 36

If A + B means A is the mother of B; A x B means A is the father of B; A \$ B means A is the brother of B and A @ B means A is the sister of B, then which of the following means P is the son of Q?

(a) a. Q + R @ P @ N (c) c. Q x R \$ P @ N Answer: D Explanation:

Q + R = Q is the mother of R R \$ P = R is the brother of P P \$ N = P is the brother of N Therefore, P is the son of Q.

Question 37

There are six persons playing cricket namely U, V, W, X, Y and Z. U and Y are brothers. Z is the sister of Y. W is the only son of U's uncle. V and X are the daughters of the brother of W's father. How is W related to Z?

(a) Cousin

(c) Mother

(b) Father (d) wife

(b) N is wife of Q(d) Q is wife of N.

(b) b. Q + R \$ P @ N

(d) d. Q + R \$ P \$ N

Answer: A

Explanation:

Z is Y's sister and hence U's sister, which means W is also the son of Z's uncle. So, W is Z's cousin.

Question 38

X – Z means X is the mother of Z; $X \times Z$ means X is the father of Z and X + Z means X is the daughter of Z. Now, if M – N × T + Q, then which of the following is not true?

- (a) T is N's daughter.
- (c) M is mother-in-law of Q

Answer: B

Explanation:

$M - N \times T + Q$ M is the moth

M is the mother of N who is the father of T who is the daughter of Q. So, M is the grandmother of the daughter of Q, i.e., M is the mother-in-law of Q. Hence (B) is not true.

Question 39

If 'A × B' means 'B is father of A', 'A+ B' means 'A is wife of B' and 'A ÷ B' means 'A isbrother of B', then, what is the relation of J with L in 'J + H ÷ R × L'?(a) Daughter(b) Daughter-in-law(c) Sister-in-law(d) Cannot be determinedAnswer: BExplanation:

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L		
(+)		
Ŕ	H⇔	
	(+)	(-)

J is R's brother's wife. L is the father of H and R. Hence, J is daughter-in-law of L.

Question 40

A is B's sister. C is B's mother. D is C's father. E is D's mother. Then, how is A related to D?

- (a) a. Grandfather
- (c) c. Daughter

(b) b. Grandmother (d) d. Granddaughter

Answer: D

Explanation:

A is the sister of B and B is the daughter of C. So, A is the daughter of C. Also, D is the father of C. So, A is the granddaughter of D.

Question 41

P is the brother of Q and R. S is R's mother. T is P's father. Which of the following statements cannot be definitely true?

(a) a. T is Q's father

(c) c. P is S's son

(b) b. S is P's mother (d) d. Q is T's son

Answer: D

Explanation:

P, Q, R are children of same parents. So. S who is R's mother and T, who is R's father will be mother and father of all three.

However, it is not mentioned whether Q is male or female So, D cannot be definitely true.

Question 42

Pointing to a person, a man said to a woman, "His mother is the only daughter of your father." How was the woman related to the person?

(a) Aunt	(b) Mother
(a) Aunt	
(c) Wife	(d) Daughter

Answer: A Explanation:

Daughter of your father — Your sister. So, the person's mother is woman's sister or the woman is person's aunt.

Question 43

A girl introduced a boy as the son of the daughter of the father of her uncle. The boy is girl's

(a) a. Brother	(b) b. Son
(c) c. Uncle	(d) d. Son-in-law
Answer: A	
Explanation:	
Daughter of uncle's father — Uncle's	sister — Mother;

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Mother's son — Brother

Question 44

Pointing out to a lady, a girl said, "She is the daughter-in-law of the grandmother of my father's only son." How is the lady related to the girl?

- (a) Sister-in-law
- (c) Aunt

(b) Mother(d) Can't be determined

Answer: D

Explanation:

Girl's father's only son— Girl's brother. Daughter in law of girl's grandmother can be their mother, or maternal uncle's wife, i.e. aunt. So relation cannot be determined.

Question 45

Pointing to a lady, a man said, "The son of her only brother is the brother of my wife." How is the lady related to the man?

- (a) Mother's sister
- (c) Mother-in-law

- (b) Grandmother
- (d) Sister of father-in-law

Answer: D

Explanation:

Brother of my wife — My brother.in-law; Son of lady's brother is the brother-in-law of the man.

So lady's brother is man's father-in-law

i.e., the lady is the sister of man's father-in-law.

Question 46

A woman introduces a man as the son of the brother of her mother. How is the man, related to the woman?

- (a) Nephew
- (c) Cousin

(b) Son (d) Uncle to Grandson

Answer: C Explanation:

Brother of mother — Uncle: Uncle's son — Cousin

Question 47

In a family, there are six members A, B, C, D, E and F. A and B are a married couple, A being the male member. D is the only son of C, who is the brother of A. E is the sister of D. B is the daughter-in-law of F, whose husband has died. How is E related to C?

(a) a. Sister	(b) b. Daughter
(c) c. Cousin	(d) D. Mother
D	

Answer: B Explanation:

A is a male and married to B. So, A is the husband and B is the wife. C is the brother of A. D is the son of C. E. who is the sister of D will be the daughter of C. B is the daughter-in-law of F whose husband has died means F is the mother of A.

Clearly. E is the daughter of C.

Question 48

There are six persons A. B, C, D, E and F. C is the sister of F. B is the brother of E's

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husband. D is the father of A and grandfather of F. There are two fathers, three brothers and a mother in the group. Who is the mother?		
(a) A	(b) B	
(c) C Answer: D	(d) E	
Explanation:		
D is father of A and grandfather of F. So, A is fat	her of F.	
Thus. D and A are the two fathers. C is the sister		
Since there is only one mother, it is evident tha	t E is the wife of A and hence the mother of C	
and F.		
So, B is brother of A There are three brothers. S	So. F is the brother of C.	
Clearly, A is E's Husband.		
<u>Ouestion 49</u>		
	only son of my mother's mother." How is the	
woman related to the man?		
(a) Mother	(b) Aunt	
(c) Sister	(d) Niece	
Answer: D		
Explanation:		
	randmother's only son — My maternal uncle. So,	
the woman is man's niece.		
PACT EVAM + NA7	ton questions:	
	TOW GOULD TOWD	
рл а Х/	2010	
	<u>2018</u>	
Question 1		
Vinod introduce Vishal as the son of the	only brother of his father's wife. How is	
Vinod related to Vishal?		
(a) Cousin	(b) Brother	
(c) Son	(d) Uncle	
Answer: A		
Vinod Introduces Vishal as the Son of the only	ly brother of his father's wife thenVinod is	
cousin of Vishal.		
Question 2		
	n of the woman who is the mother of the	
husband of my mother". How Suresh is r		
-		
(a) Brother-in-law	(b) Son	
(c) Brother	(d) Nephew	
Answer: B		
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Suresh introduces a man as "he is the son of the woman who is **the** mother of the husband of my mother". Then Suresh is the <u>'Son'</u> the man.

Question 3

A reads a book and find the name of the author familiar. The author' is the paternal uncle of C. C is the daughter of A. How is Crelated to A

(a) Brother

(c) Father

Answer: A



(b) Sister (d) Uncle

Question 4

P and Q are brothers R and S are sisters. P's son is R's brother. How I Q related to R?

(a) Uncle (c) Father

Answer: A

(b) Brother (d) Grandfather



As P is father of S and P is its brother so they are uncle and nephew So, relationship between Q and R is of Uncle.

<u>NOV 2018</u>

Question 1

Pointing to a man in a photograph, a woman said, "the father of his brother is the only son of my grandfather", how is the woman related to man in the photograph?

- (a) Mother
- (c) Daughter

(b) Aunty (d) Sister

Answer: D Explanation:

The father of his brother is the only son of my grandfather. So, the women is man's sister.

Only son of women's grandfather = woman's father Man's brother's father-man's

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FOR ENQUIRY - 6262969604 6262969699 father so. The women is man's sister. **Ouestion 2** Six persons are seen together in a group. They are A, B, C, D, E and F, B is brother of D, but D is not brother of B. F is brother of B, C and A are married together. F is son of C, but C is not mother of F. E is brother of A. The number of female member in the group is (a) 1 (b) 2(c) 3 (d)4**Answer: B** ► E⁺ (+) means - male B⁺ (-) means - female > D No. of female members = 2**Ouestion 3** Ram and Mohan are brothers, Shankar is Mohan's father. Chhaya is Shankar's sister. Priya is Shankar's niece. Shubhra is Chhaya's granddaughter. Then Ram is Shubhra's.

(a) Brother

(c) Cousin Answer: B (b) Uncle (d) Nephew

(Chihaya)	(father) (+) (Stjankar) Monars* (Bro)	Nices Priya
(Grand daughter)		

Ram is the uncle of Shubhra.

Question 4

If P + Q means P is the mother of Q. P \div Q means P is the father of Q.P-Q means P is the sister of Q. Then which of the following relationship shows that M is the daughter of R?

(a) R + M + N

(c) R - M+N

Answer: A

M+N i.e., R is the father of M. Hence, R: M+N clearly means That, M is the daughter of R. (b) R + N +M (d) None of the above

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<u>MAY 2019</u>

Question 1

Pointing to a photograph, a Man said "His Mother husband's sister is my aunt". Then what is relation between a man and he?

(b)

(d)

ncle

rother

(a)Son

(c) Nephew

Answer: D

Explanation: man's mother husband = father So the answer be man's Brother

Question 2

Pointing to old man Kailash said "his son is my son's uncle" How is kailash is related to old man.

(a) Brother (c) Father (b) Either son (or) son-in-law (d) Grand Father

Answer: B

Explanation: So Kailash is related to old man is in terms of Father son relation.

Question 3

If A is the brother of B; B is the sister of C; and C is the father of D, how D is related to A?

(a) Brother

(c) Nephew

(b) Sister (d) Cannot be determined

Answer: D

Explanation:

If D is Male, the answer is Nephew. If D is Female, the answer is Niece. As the sex of D is not known, hence, the relation between D and A cannot be determined. Note: Niece - A daughter of one's brother or sister, or of one's brother-in-law or sister-in-law. Nephew - A son of one's brother or sister, or of one's brother-in-law or sister-in-law.

Question 4

A is the son of C; C and Q are sisters; Z is the mother of Q and P is the son of Z. Which of the following statements is true?

(a) P and A are cousins	(b) P is the maternal uncle of A
(c) Q is the maternal grandfather of A	(d) C and P are sisters

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NOV 2019 A, B, C, D, E and F are members of a family. B is the son of A DUE the mother of B, A and C are married couple. F is the brother of A. D is the sister of B, E is the son of C.

C and Q are sisters and A is the son of C. Hence, C is the mother of A or Z is the mother Q. Hence, Z is the maternal grandmother of A. P is the son of Z. Hence, P is the maternal

Ouestion1

Answer: B Explanation:

uncle of A.

How many male members are there in the family.

(a) 1	(b) 2
(c) 3	(d) 4

Q.2 How is F related to B?

(a) Uncle	(b) Daughter
(c) Son	(d) Niece

Q.3 How many children A has?

(a) 3	(b) 2
(c) 4	(d) 1

Answer:

```
For question [1-3]
```

(+) => male

(-) => female

(Mother) C⁻ A⁺(Father) Bro Son Sister Daughter Ė+

Q.1 (Ans.) (d) There are four male members in the family i.e.

A (father or husband)

F (A's brother)

B (son of A and C)

12.19

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E (son of A and C)

Q.2 (Ans.) (a) Since F is A's brother and B is A's son. father's brother = uncle So, F is the uncle of B

Q.3 (Ans.) (a) A has 3 children E, B and D

DEC 2020

Question 1

Pointing towards a person a man said to a woman. "His mother is the	only
daughter of your father". How is the woman related to that person?	

(a) daughter

(b) mother (d) wife

(c) sister **Answer: B**

Explanation:

The only daughter of the woman's father is she herself. So, the person is the woman's son. i.e., the woman is the person's mother. Hence, the answer is (b).

Ouestion 2

Vicky introduces John as the son of the only brother of his father's wife. How is Vicky related to John?

(a) Cousin (c) Brother (b) Son (d) Uncle

Answer: A

Explanation:

The only brother of his father's wife is Sohan's maternal uncle. So. Mohan is Sohan's maternal uncle's son. So, Mohan is Sohan's cousin.

Option A.

Ouestion 3

Point out to a lady sohil said she is the daughter of woman. Who is the mother of the husband of my mother? Who is the lady to sohil?

(a) Sister

(c) Daughter

(b) Aunt

(d) Sister-in-law

Answer: B Explanation:

The relations may be analyzed as follows:

Mother's husband \Rightarrow Father:

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Father's mother \Rightarrow Grandmother; Grandmother's daughter \Rightarrow Father's sister; Father's sister \Rightarrow Aunt. So, the lady is Rajan's aunt. Hence, the answer is (b).

<u>JAN 2021</u>

Question 1

P is the brother of Q and R, S is the mother of R. T is the father of P. which of the following statements cannot be definitely true?

(a) S is the mother of P (c) T is husband of S (b) P is son of S (d) O is son of T.

Answer: D

Explanation:

P, Q, R are children of same parents. So. S who is R's mother and T, who is R's father will be mother and father of all three. However, it is not mentioned whether Q is male or female So, D cannot be definitely true.

Question 2

Pointing to a lady in a photograph, Ran said, "her son's father is the son-in-law of my mother," how is Ram related to the lady?

(b) Cousin

(d) Mother

(a) Aunt
(c) Sister
Answer: B
Explanation:
Ram is brother of that lady.

Question 3A girl introduces a boy as the son of the daughter of the father of her unclethe boy is girl's(a) Son(b) Brother(c) Son-in-law(d) UncleAnswer: BExplanation:Daughter of uncle's father — Uncle's sister — Mother; Mother's son — Brother

Question 4

Pointing to lady, Sahil said "She is the daughter of the woman who is the mother of the husband of my mother, "who is the lady to Sahil?

(a) Aunt	(b) Sister
(c) Daughter	(d) Sister – in – law
Answer: A	

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Explanation:

The relations may be analyzed as follows: Mother's husband \Rightarrow Father: Father's mother \Rightarrow Grandmother: Grandmother's daughter \Rightarrow Father's sister; Father's sister \Rightarrow Aunt. So, the lady is Rajan's aunt. Hence, the answer is (a).

JULY 2021

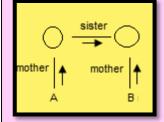
Ouestion 1 Pointing towards "A", "B", said: "Your mother is younger sister of my mother". "A" is related to "B" as

(a) Uncle

(c) Nephew **Answer: Options (b)** (b) Cousin (d) Father

Explanation:

Pointing towards A, B said "your mother is the younger sister of my mother" We draw the flow chart of given information as follows, circle around the alphabet indicates that person is a lady



A is the cousin of B. So b is the answer

Ouestion 2

Shyam's mother said to Shyam "my mother has a son whose son is Ram". Shyam is related to Ram as _

(a) Uncle (c) Nephew (b) Cousin (d) Grandfather

Answer: Options (b)

Question 3 Amit said "This girl is the wife of the grandson of my mother". How Amit related to the girl? (a) Father-in-law (b) Grandson (c) Father

(d) Son

Answer: Options (a)

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Explanation:

The grand-son of Amit's mother mean his son. So, the wife of his son is daughter-in-law to him. Therefore, Amit is the father-in-law of the girl.

Ouestion 4

A is the son of C; C and Q are sisters: Z is the mother of Q and P is the son of Z. Which of the following statements is true?

(a) A and P are cousins (c) P is the maternal uncle of A

- (b) C and P are sisters
- (d) A is the maternal uncle of P

Answer: Options (c) Explanation:

C and Q are sisters and A is the son of C. C is the mother of A and Z is the mother Q. Hence, Z is the matemal grandmother of A. P is the son of Z. Hence, P is the material uncle of A.

DEC 2021

Ouestion 1

D is daughter of E. A is son of D. C is a brother of A and B is the sister of A. F is the brother of D. How F is related to B?

(a) Father-in-law

(b) Brother

(d) Son-in-law

(c) Uncle

Answer: c Explanation:

Let me be B. Since I'm the sister of A, A is my brother. Since A (my brother) is the son of D, D is my mother. Since F is the brother of D (my mother), F is my maternal uncle.

Ouestion 2

Introducing a boy a girl said, "He is the son of the daughter of the father of my uncle". Who is the boy to the girl? (b) Nephew

(a) Brother

- (c) Uncle
- **Answer: a**

Explanation:

Let me be the girl introducing the boy. If the uncle is paternal, then the father of my uncle would be my grandfather (Dadaji), and hence his daughter would be my aunt (Bua). Son of my Bua would be my cousin. However, cousin is not in iS the options.

If the uncle is maternal, then the father of my uncle would be my grandfather (Nanaji),

12.23

(d) Mother-in-law

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and hence his daughter could either be my Mother, or my Aunt (Mausi). Again, if the daughter is my Aunt, then her son would be my cousin, and cousin is not in the options. If the daughter is my Mother, then her son would be my brother.

Therefore, option (a) is the answer.

Question 3

It is given that' A is the mother of B; B is the sister of C; C is the father of D". How is A related to D?

(a) Mother(c) Aunt

(b) Grandmother(d) Sister

Answer: b

Explanation:

Let me be D. C is my father. B, my father's sister, is my Aunt. A, my aunt's mother, would be my Grandmother.

Question 4

R told to M as, "the girl, I met at the beach, was the youngest daughter of the brother-in-law of my friend's mother". How is the girl related to R's friend?

(a) Cousin	
(c) Niece	

(b) Daughter (d) Aunt

Answer: a

Explanation:

Let me be R's friend. Now, my mother's brother-in-law would be either my paternal uncle, or my maternal aunt's husband. Either way, the daughter would be my cousin.

Question 5

P,Q, R, S, T, U are 6 members of a family in which there are two married couples. T, a teacher is married to a doctor who is mother of R and U. Q the lawyer is married to P. P has one son and one grandson. Of the two married ladies one is a housewife. There is also one student and one male engineer in the family. Which of the following is true about the granddaughter of the family?

- (a) She is a lawyer
- (c) She is a student

(b) She is an engineer(d) She is a doctor

Answer: c

Explanation:

The family tree is as follows:

Q is the male lawyer married to P who iS a housewife. They have a son, T, who is a teacher. T is married to S, who is a doctor. They have two children - R and U. Out of them, one is a male engineer, and the other is a student.

Therefore, the granddaughter of the family is a student.

Question 6 X and Y are brothers. R is the father of Y. S is the brother of T and maternal uncle

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of X. What is T to R? (a) Mother (c) Sister Answer: b Explanation:

Abdemand T RT

T is the wife of 'R

<u>JUNE 2022</u>

(b) Wife

(d) Brother

Question 1

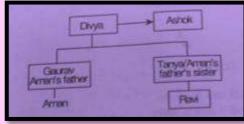
Ravi is son of Aman's father's sister. Ram is son of divya. Who is the mother of Gourv and grandmother of Aman. Ashok is father of Tanya and grandfather of Ravi. Divya is wife of Ashok. How is Ravi related to Divya?

(b) Grandson

(d) None

(a) Nephew (c) Son

Answer: Options (b) Explanation:

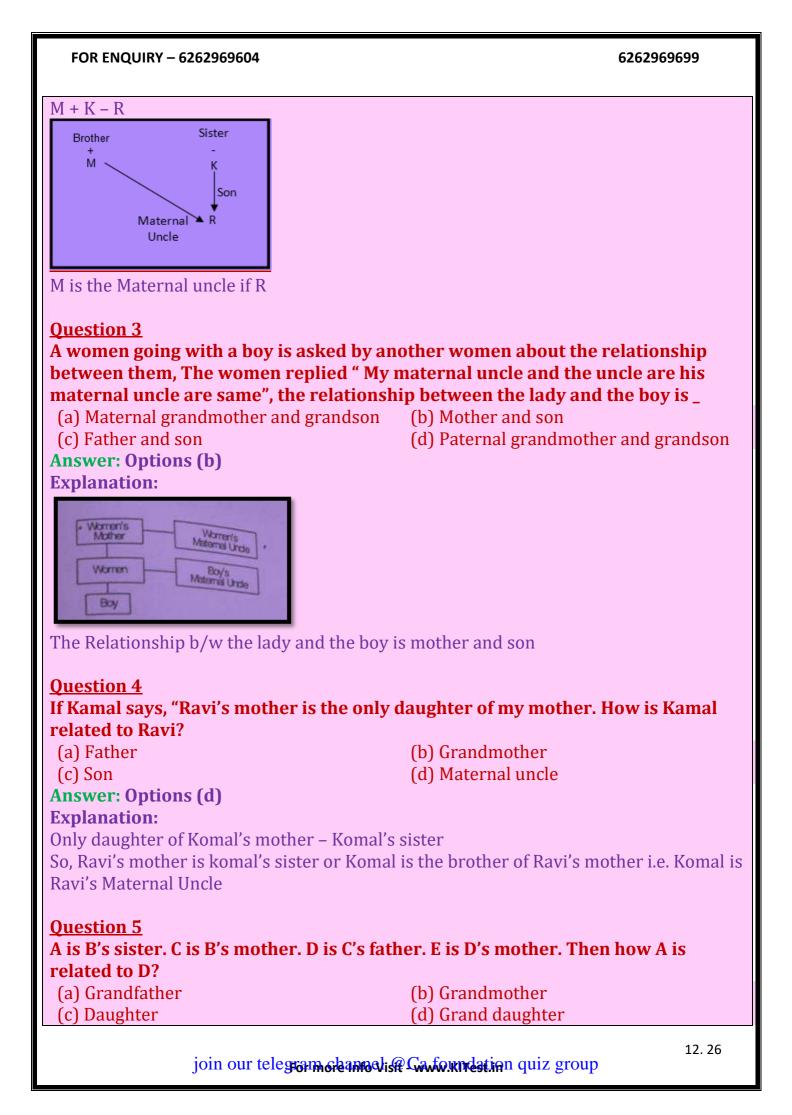


Ravi is the grandson of Divya.

Question 2

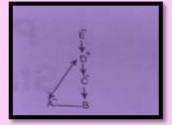
P + Q means P is brother of Q, P + Q means P is the mother of Q, P × Q means P isthe sister of Q. Which of the following means M is the maternal uncle of R?(a) M + K + R(b) M - R + K(c) M + K - R(d) $M + K \times R$ Answer: Options (c)Explanation:P + Q means 'P' is the brother of 'Q'P - Q means 'P' is the mother of 'Q'P × Q means 'P' is the sister of Q

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Answer: Options (a) Explanation:



: D is the father of C and D is the grandfather of A.

Question 6

If A \$ B means A is father of B. A # B means A is daughter of B. A @ B means A is sister of B. Then how is K related to M H @ K \$ L # M

(b) Uncle

(d) Grandson

(a) Husband

(c) Father

Answer: Options (a) Explanation:

Means	Sibling, = Pairs			5
- н —	+ K → L	=	M	1 NG

K is the husband of M

DEC 2022

Question 1

Suresh's sister is the wife of Ram. Ram is Rani's brother, Ram's father is Madhur Sheetal is Ram's grandmother. Rema is sheetal's daughter – in – law. Rohit is Rani's brother's son. Who is Rohit to Suresh?

- a) Brother-in-law
- c) Brother

b) Son

d) Nephew

Answer: Options (d) Explanation:

→ Ram is brother of Rani Rohit is son of Ram suresh is maternal uncle of Rohit Therefore, Rohit is nephew of Suresh So, the answer is (d)

Question 2

There are six children playing football namely A, B, C, D, E, and F, A, & E are brothers. F is sister of E. C is the only son of A's uncle. B & D are daughters of the

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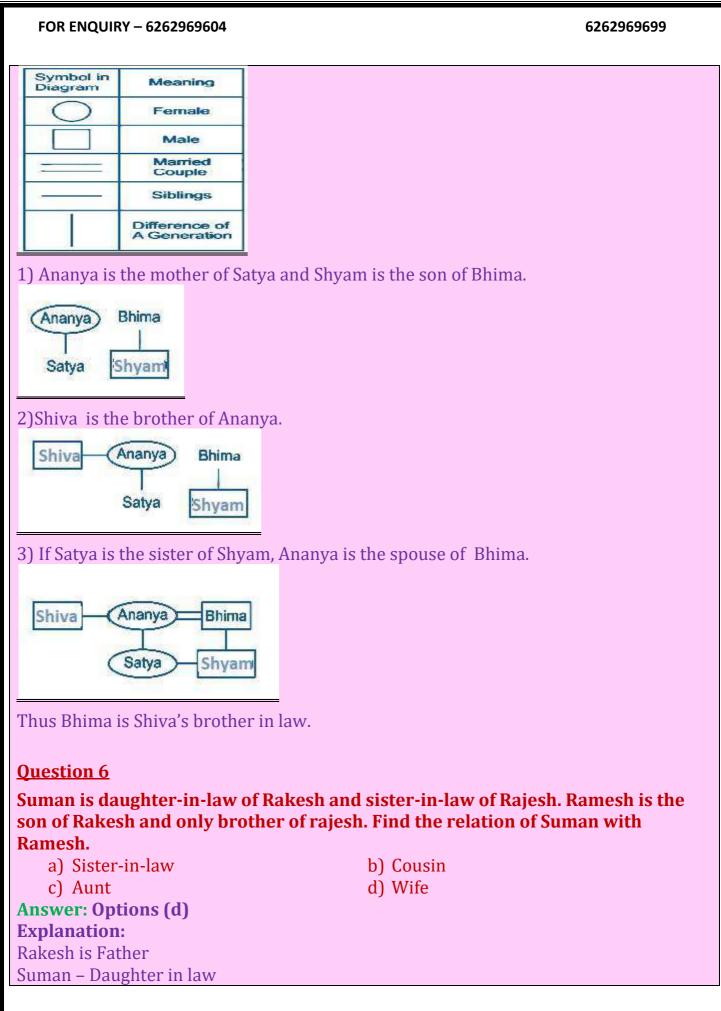
aj Uncie	b) Cousin			
c) Niece	d) Sister			
Answer: Options (b)				
Explanation:	an and Clafathania Ala Unala. Ca. D'a fathania			
	er and C's father is A's Uncle. So, D's father is			
also A's Uncle. Thus, D is A's cousin.				
Question 3				
In a joint family, there are father, moth				
	aughters each and one has a son only. How			
many female members are there in the	family?			
a) 3	b) 6			
c) 9	d) 5			
Answer: Options (c)				
Explanation:				
Female members: Mother, 3 daughters-in-	law, one daughter. Four grand daughters			
Thus, there are nine female members.				
Question 4				
When Rani saw Vinit, she recollected th	at "He is the brother of My			
grandfather'son." How is Rani related t				
a) Aunt c) Sister	b) Daughter d) Niece			
Answer: Options (d)	uj Mete			
Explanation:				
Grandfather's son can be Father or uncle s	o his brother is uncle of Rani			
Hence, Rani is niece of Vinit.				
Question 5				
Annanya is mother of Satya and Shyam is the son of Bhima. Shiva is brother of				
Annanya. If Satya is sister of Shyam, how Bhima is related top Shiva?				
a) Son	b) Cousin			
c) Brother-in-law	d) Son-in-law			
Answer: Options (c)				
Explanation:				
Below table shows symbols and their desc	cription,			
	12.28			
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b) Cousin

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a) Uncle

brother of C's father. How D is related to A?



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Rajesh – brother of ramesh and children if rakesh Ramesh – Husband of Suman **Hence, Suman is wife of Ramesh.**

Question 7

Pointing to a man in photograph, Khushi says, "This man's son's sister is my mother-in-law." How is the Khushi's husband related to the man in the photograph?

a) Grandson

b) Son

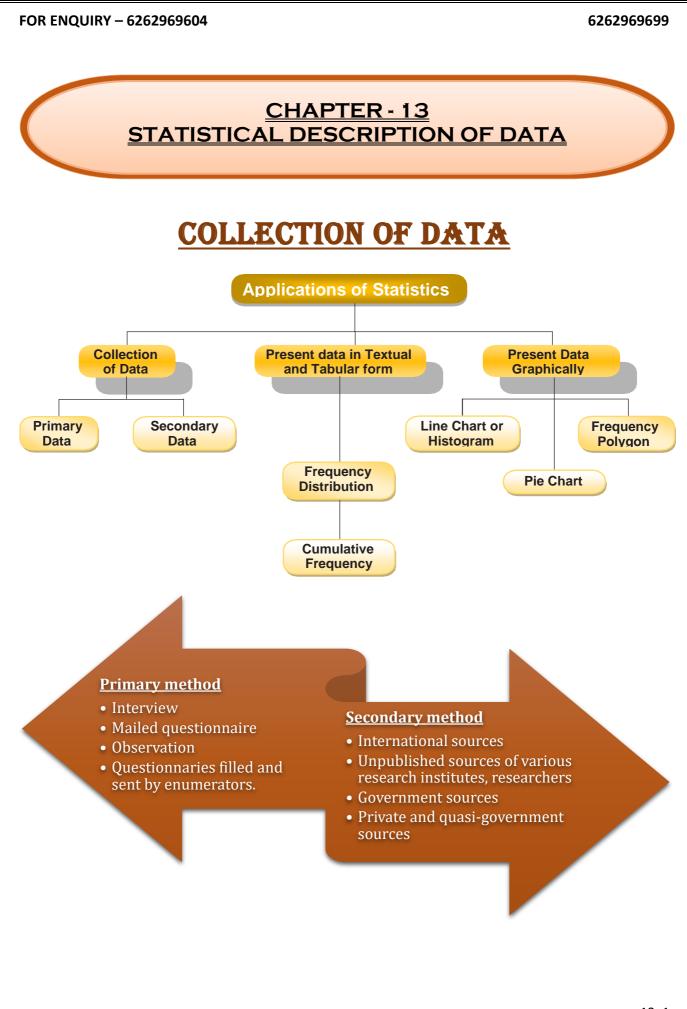
c) Son in law

d) Cousin

Answer: Options (a)

Explanation:

Man's son's sister is man's daughter. So, the man's daughter is the mother of the woman's husband. Thus, the woman's husband is the grandson of the man in the photograph.



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PRESENTATION OF DATA	Classification or Organization of DataThe process of arranging data on the basis of the characteristic under consideration into a 		
	Data may be classified as	 (i) Chronological or Temporal or Time Series Data; (ii) Geographical or Spatial Series Data; (iii) Qualitative or Ordinal Data; (iv) Quantitative or Cardinal Data. 	
	Mode of Presentation of Data	 (a) Textual presentation (b) Tabular presentation or Tabulation (c) Diagrammatic representation I. Line diagram or Histogram II. Bar diagram III. Pie chart 	
FREQUENCY DISTRIBUTION	tabular representation of statistical data, usually in an ascending order, relating to a measurable characteristic according to individual value or a group of values of the characteristic under study		
CLASS LIMIT (CL)	Corresponding to a class interval, the class limits may be defined as the minimum value and the maximum value the class interval may contain.		
CLASS BOUNDARY (CB)	Class boundaries may be defined as the actual class limit of a class interval LCB = LCL $-\frac{D}{2}$		
MID-POINT OR MID-VALUE OR CLASS MARK	Corresponding to a class interval, this may be defined as the total of the two class limits or class boundaries to be divided by 2. Thus, we have mid-point= $\frac{\text{LCL + UCL}}{2}$		
CUMULATIVE FREQUENCY	Thecumulativefrequencycorrespondingtoavalueforadiscretevariableand correspondingto a class boundary for a continuous variable may be defined as the number of observations less than the value or less than or equal to the class boundary.		
GRAPHICAL REPRESENTATION	•Histogram or Area diagram: A histogram is an accurate representation of the distribution of numerical data. It is an estimate of the probability		
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OF AFREQUENCY DISTRIBUTION	 distribution of a continuous variable (quantitative variable) and was first introduced by Karl Pearson. Frequency Polygon: Frequency polygons are a graphical device for understanding the shapes of distributions. They serve the same purpose as histograms, but are especially helpful for comparing sets of data. Frequency polygons are also a good choice for displaying cumulative frequency distributions. Ogives or Cumulative Frequency Graph: Cumulative histograms, also known as ogives, are graphs that can be used to determine how many data values lie above or below a particular value in a data set. The cumulative frequency to the total of the frequencies of all data values before it in the data set.
FREQUENCY CURVE	 A frequency curve is a smooth curve for which the total area is taken to be unity. It is a limiting form of a histogram or frequency polygon. Types of frequency curves namely: (a) Bell-shaped curve (b) U-shaped curve (c) J-shaped curve (d) Mixed curve.
STATISTICS	The term statistics is ultimately derived from the New Latin statisticum collegium ("council of state") and the Italian word statista ("statesman" or "politician") Thus, the original principal purpose of Statistik was data to be used by governmental and (often centralized) administrative bodies.



Question 1

What percentage of candidates passed the exam from Institute T out of the total number of candidates enrolled from the same institute?

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Candidatos Enrolled = 8550



Candidates who Passed the Exam = 5700



(a) 50% (c) 75% **Answer: C**

Explanation:

Required percentage = $\left< \frac{9\% \text{ of } 5700}{8\% \text{ of } 8550} \times 100 \right> \% = \left< \frac{9 \times 5700}{8\% \text{ of } 8550} \times 100 \right> \% = 75\%.$

Question 2

Which institute has the highest percentage of candidates passed to the candidates enrolled?

(b) 62.5%

(d) 80%

(a) Q	(b) R
(c) V	(d) T

Answer: B

Explanation:

The percentage of candidates passed to candidates enrolled can be determined for each institute as under:

(i) $P = \left[\left(\frac{18\% OF 5700}{22\% OF 8550} \right) \times 100 \right] \% = \left[\frac{18 \times 5700}{22 \times 8550} \times 100 \right] \% = 54.55\%$

(ii) Q =
$$\left[\left(\frac{17\% \ OF \ 5700}{15\% \ OF \ 8550} \right) \times 100 \right] \% = 75.56\%$$

(iii) R =
$$\left[\left(\frac{13\% OF 5700}{10\% OF 8550} \right) \times 100 \right] \% = 86.67\%$$

(iv) S =
$$\left[\left(\frac{16\% OF 5700}{17\% OF 8550} \right) \times 100 \right] \% = 62.75\%$$

(v) T =
$$\left[\left(\frac{9\% \ OF \ 5700}{8\% \ OF \ 8550} \right) \times 100 \right] \% = 75\%$$

(vi) V =
$$\left[\left(\frac{15\% OF 5700}{12\% OF 8550} \right) \times 100 \right] \% = 83.33\%$$

(vii) X = $\left[\left(\frac{12\% OF 5700}{16\% OF 8550} \right) \times 100 \right] \% = 50\%$

Highest of these is 86.67% corresponding to institute R.

Question 3

The number of candidates passed from institutes S and P together exceeds the number of candidates enrolled from institutes T and R together by:

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FOR ENQUIRY - 6262969604 6262969699 (a) 288 (b) 279 (c) 399 (d) 407 **Answer: C Explanation**: Required difference = [(16% + 18%) of 5700] - [(8% + 10%) of 8550]= [(34% of 5700) - (18% of 8550)] =(1938 - 1539)= 399. **Ouestion 4** What is the percentage of candidates passed to the candidates enrolled for institutes Q and R together? (a) 68% (b) 80% (c) 74% (d) 65%**Answer: b Explanation**: Candidates passed from institute Q And R together = [(13% + 17%) of 5700]= 30% of 5700. Candidates enrolled from institute Q at = [(15% + 10%) of 8550]= 25% of 8550. ∴ Required Percentage = $\left(\frac{30\% \text{ of } 5700}{25\% \text{ of } 8550} \times 100\right)\%$ $=\left(\frac{30\times5700}{25\times8550}\times100\right)\%$ = 80%

Question 5What is the ratio of candidates passed to the candidates enrolled from institute P?(a) 9: 11(b) 14: 17(c) 6: 11(d) 9: 17Answer: CExplanation:Required ratio = $\left(\frac{18\% of 5700}{22\% of 8550}\right) = \left(\frac{18 \times 5700}{22 \times 8550}\right) = \frac{6}{11}$

Question 6

A sum of Rs. 4.75 lakhs were invested in Company Q in 1999 for one year. How much more interest would have been earned if the sum was invested in company P? (a) Rs. 19,000 (b) Rs. 14, 250

(d) Rs. 9500

(a) Rs. 19,000 (c) Rs. 11,750 **Answer: D Explanation:**

Difference

- = Rs. [(10% of 4.75) (8% of 4.75) lakhs
- = Rs. (2% of 4.75) lakhs
- = Rs. 0.095 lakhs
- = Rs. 9500

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Question 7

If two different amounts in the ratio 8:9 are invested in company's P and Q respectively in 2002, then the amounts received after one year as interests from company's P and Q are respectively in the ratio?

(b) 3;4

(d) 4:3

(a) 2:3

(c) 6:7

Answer: D

Explanation:

Let the amounts invested in 2002 in Companies P and Q be Rs. 8x and Rs. 9x respectively. Then, interest received after one year from company P = Rs. (6% of 8x) = Rs $\frac{48x}{100}$ And interest received after one year from company Q = Rs. (4% of 9x) = Rs. $\frac{36x}{100}$

 $\therefore \text{ Required ratio} = \frac{\left(\frac{48x}{100}\right)}{\left(\frac{36x}{100}\right)} = \frac{4}{3}$

Question 8

In 2000, a part of Rs. 30 lakhs was invested in company P and the rest was invested in company Q for one year. The total interest received was Rs. 2.43 lakhs. What was the amount invested in company P?

(a) Rs. 9 lakhs	(b) Rs. 11 lakhs
(c) Rs. 12 lakhs	(d) Rs. 18 lakhs

Answer: D

Explanation:

Let Rs. X lakhs be invested in company P in 2000, the amount invested in company Q in 2000 = Rs. (30 – x) lakhs.

Total interest received from the two companies after 1 year

 $= \text{Rs.} [(7.5\% \text{ of } x) + \{9\% \text{ of } (30 - x)\}] \text{ lakhs}$

 $= \left[Rs. 2.7 - \left(\frac{1.5x}{100}\right) lakhs \right]$ $\therefore \left[2.7 - \left(\frac{1.5x}{100} \right) \right] = 2.43 \qquad => \qquad x = 18$

Ouestion 9

An investor invested a sum of Rs. 12 lakhs in company P in 1998. The total amount received after one year was re-Invested in the same company for one more year. The total appreciation received by the investor on his investment was?

(a) Rs. 2, 96,200 (c) Rs. 2, 25, 600 (b) Rs. 2, 42,200 (d) None

Answer: C

Explanation:

Amount received from Company P after one year (i.e., in 199) on investing Rs. 12 lakhs in it. = Rs. [12 + (8% of 12)]lakhs

= Rs. 12.96 lakhs

Amount received from company P after one year on investing Rs. 12.96 lakhs in the year 1999 = Rs. [12.96 + {10% of 12.96}] lakhs

= Rs. 14.256

Appreciation received on investment during the period of two years

= Rs. (14.256 – 12) lakhs

= Rs. 2.256 lakhs

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= Rs. 2, 25,600.

Question 10

An investor invested Rs. 5 lakhs in company Q in 1996. After one year, the entire amount along with the interest was transferred as investment to Company P in 1997 for one year. What amount will be received from Company P, by the investor?

(b) Rs. 5, 80,425

(d) Rs. 5,77,500

(a) Rs. 5,94,550

(c) Rs. 5,77,800

Answer: B

Explanation:

Amount received from Company Q after one year on investment of Rs. 5 lakhs in the year 1996 $\,$

= Rs. [5 + (6.5% of 5)] lakhs

= Rs. 5.325 lakhs.

Amount received from company P after one year on investment of Rs. 5.325 lakhs in the year 1997.

= Rs.[5.325 + (9% of 5.325)] lakhs

= Rs. 5.80425 lakhs

= Rs. 5, 80,425.

Direction (for Q. Nos. 11 – 15):

The following table gives the sales of batteries manufactured by a company over the years.

Number of Different Types of Batteries Sold by a Company Over the Years (Numbers in Thousands)

Year	Types of Batteries					
Tear	4AH	7AH	32AH	35AH	55AH	Total
1992	75	144	114	102	108	543
1993	90	126	102	84	126	528
1994	96	114	75	105	135	525
1995	105	90	150	90	75	510
1996	90	75	135	75	90	465
1997	105	60	165	45	120	495
1998	115	85	160	100	145	605

Question 11

What was the approximate percentage increase in the sales of 55AH batteries in 1998 compared to that in 1992?

(b) 31%

(d) 34%

(a) 28% (c) 33% Answer: D Explanation:

Require d percentage = $\left[\frac{(145-108)}{108} \times 100\right]\%$ = 34.26% = 34%

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Ouestion 12 The total sales of all seven years in the maximum for the maximum for which battery? (a) 4AH (b) 7AH (c) 32AH (d) 35AH **Answer: C Explanation:** The total sales (in thousands) of all the seven years for various batteries are: For 4AH = 75 + 90 + 96 + 105 + 90 + 105 + 115 = 676 For 7AH = 144 + 126 + 114 + 90 + 75 + 60 + 85 = 694 For 32AH = 114 + 102 + 75 + 150 + 135 + 165 + 160 = 901 For 35AH = 102 + 84 + 105 + 90 + 75 + 45 + 100 = 601 For 55AH =108 + 126 + 135 + 75 + 90 + 120 + 145 = 799. Clearly sales are maximum in case of 32AH batteries. **Ouestion 13** What is the difference in the number of 35AH batteries sold in 1993 and 1997? (b) 28000 (a) 24000 (c) 35000 (d) 39000 **Answer: D Explanation:** Required difference = $[(84 - 45) \times 1000] = 39000$. **Question 14** The percentage of 4AH batteries sold to the total number of batteries sold was maximum in the years? (a) 1994 (b) 1995 (d) 1997 (c) 1996 **Answer: D Explanation**: The percentage of sales of 4AH batteries to the total sales in different years are; for $1992 = (\frac{75}{543} \times 100)\% = 13.81\%$ for $1993 = (\frac{90}{528} \times 100)\% = 17.05\%$ for $1994 = (\frac{96}{525} \times 100)\% = 18.29\%$ for $1995 = \left(\frac{105}{510} \times 100\right)\% = 20.59\%$ for $1996 = \left(\frac{96}{465} \times 100\right)\% = 19.35\%$ for $1997 = \left(\frac{105}{495} \times 100\right)\% = 21.21\%$ for $1998 = \left(\frac{105}{605} \times 100\right)\% = 19.01\%$ Clearly the percentage in maximum in 1997 **Question 15** In case of which battery there was a continuous decrease in sales from 1992 to 1997? (a) 4AH (b) 7AH (c) 32AH (d) 35AH **Answer: B Explanation:**

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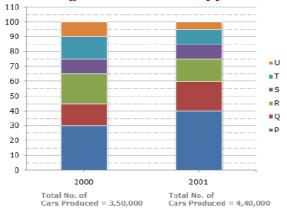
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From the table it is clear that the sales of 7AH batteries have been decreasing continuously from 1992 to 1997.

Direction (for Q. Nos. 16-20):

The bar graph given below shows the percentage distribution of the total production of a car manufacturing company into various models over two years. Percentage of Six different types of Cars manufactured by a Company over Two Years



Question 16

What was the difference in the number of Q type cars product in 2000 and that produce in 2001?

(a) 35,500	(b) 27,000
(c) 22,500	(d) 17,500

Answer: A

Explanation: Total numbers of Q type cars produced in 2001 = (60 - 40) % of 4, 40,000 = 88,000. Total numbers of Q type cars produced in 2000 = (45 - 30) % of 3, 50,000 = 52,500. ∴ Required difference = (88000 - 52500) = 35,500.

Question 17

Total number of cars of models P, Q and T manufactured in 2000 is?

rotar number of cars of mouels r,	Q and T manufactured in 2000
(a) 2,45,000	(b) 2,27,500
(c) 2,10,000	(d) 1,92,500
Answer: C	
Explanation:	
Analysis of the graph:	
We shall first determine the number	of cars of each model produced l
the two years:	

In 2000: Total number of cars produced = 3, 50, 000

P = (30 - 0) % OF 3,50,000 = 30% OF 3,50,000 = 1,05,000. Q = (45 - 30) % OF 3,50,000 = 15% OF 3,50,000 = 52,500. R = (65 - 45) % OF 3,50,000 = 20% OF 3,50,000 = 70,000 S = (75 - 65) % OF 3,50,000 = 10% OF 3,50,000 = 35,000 T = (90 - 75) % OF 3,50,000 = 15% OF 3,50,000 = 52,500 U = (100 - 90) % OF 3,50,000 = 10% OF 3,50,000 = 35,000

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by the company during

In 2001: Total number of cars produced = 4, 40,000.

P = (40 - 0) % OF 4, 40,000 = 40% OF 4, 40,000 = 1, 76,000. Q = (60 - 40) % OF 4, 40,000 = 20% OF 4, 40,000 = 88,000 R = (75 - 60) % OF 4, 40,000 = 15% OF 4, 40,000 = 66,000 S = (85 - 75) % OF 4, 40,000 = 10% OF 4, 40,000 = 44,000 T = (75 + 60) % OF 4, 40,000 = 10% OF 4, 40,000 = 44,000. U = (100 - 95) % OF 4, 40,000 = 5% OF 4, 40,000 = 22,000Total number of cars of models P, Q, and T manufacturing in 2000 = (105000 + 52500 + 52500) = 2, 10,000.

Question 18

If the percentage production of P type cars in 2001 was the same as that in 2000, then the number of P type cars produced in 2001 would have been?

(a) 1,40,000	(b) 1,32,000
(c) 1,17,000	(d) 1,05,000

Answer: B

Explanation:

If the percentage production of P type in cars in 2001

- = Percentage production of P type cars inn 2000
- = 30%
- Then, number of P type cars produced in 2001
 - = 30% of 4, 40,000
 - = 1, 32,000.

Question 19

If 85% of the cars produced in each year were sold by the company, how many S type cars remain unsold?

(b) 9350

(d) 12,250

(a) 7650

(c) 11,850

Answer: C

Explanation:

Number of S type cars which remained unsold in 2000 = 15% of 35,000 And number of S type cars which remained unsold in 2001 = 15% of 44, 00.

- \therefore Total number of S type cars which remained unsold
 - = 15% of (35,000 + 44,000)
 - = 15% of 79,000
 - = 11,850

Question 20

For which model the percentage rise/fall in production from 2000 to 2001 was minimum? (a) Q (b) R

Answer: B

(c) S

Explanation:

The percentage change (rise/fall) in production from 2000 to 2001 for various models is:

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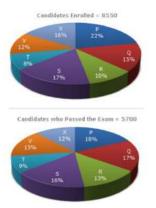
(d) T

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For P =
$$\left[\frac{(176000-105000)}{105000} \times 100\right]$$
% = 67.62% rise.
For Q = $\left[\frac{(88000-52500)}{52500} \times 100\right]$ % = 67.62% rise.
For R = $\left[\frac{(70000-66000)}{70000} \times 100\right]$ % = 5.71% fail.
For S = $\left[\frac{(44000-35000)}{35000} \times 100\right]$ % = 25.71% rise.
For T = $\left[\frac{(52500-44000)}{52500} \times 100\right]$ % = 16.19% fail.
For U = $\left[\frac{(35000-22000)}{35000} \times 100\right]$ % = 37.14% fail.
 \therefore Minimum percentage ride/fail is production is the cash of model R.

Direction (for Q.Nos. 21 - 24):

Study the following graph and tables and answer the questions given below. Distribution of candidates who were enrolled for MBA entrance exam and the candidates (out of those enrolled) who passed the exam in different institutes:



Ouestion 21

What will be the percentage of total number of males in U.P., M.P. and Goa together to the total population of all the given states? (a) 25% (b) 27.5% (c) 38.5% (d) 31.5% Answer: C Explanation: Number of males in U.P = $\left[\frac{3}{5} \text{ of } (15\% \text{ OF N})\right] = \frac{3}{5} \times \frac{15}{100} \times \text{N} = 9 \times \frac{\text{N}}{100}$ Where N = 3276000. Number of males in M.P. = $\left[\frac{3}{4} \text{ of } (20\% \text{ OF N})\right] = \frac{3}{4} \times \frac{20}{100} \times \text{N} = 15 \times \frac{\text{N}}{100}$ Number of males in Goa = $\left[\frac{3}{8} \text{ of } (12\% \text{ OF N})\right] = \frac{3}{8} \times \frac{12}{100} \times \text{N} = 4.5 \times \frac{\text{N}}{100}$ \therefore Total numbers of males in these three states = $(9 + 15 + 4.5) \times \frac{\text{N}}{100}$

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$$= \left(28.5 \times \frac{N}{100}\right).$$

∴ Required Percentage = $\left[\frac{\left(28.5 \times \frac{N}{100}\right)}{N} \times 100\right]\% = 28.5\%$

 Question 22

 What was the total number of illiterate people in A.P. and M.P. in 1998?

 (a) 876040
 (b) 932170

 (c) 981550
 (d) 1161160

 Answer: D

 Explanation:

 No. of illiterate people in A.P. = $\left[\frac{7}{9} of (25\% of 3276000)\right] = 637000$.

 No. of illiterate people in M.P. = $\left[\frac{4}{5} of (20\% of 3276000)\right] = 524160$.

 \therefore Total number = (637000 + 524160) = 1161160.

Question 23

 What was the number of males in U.P. in the year 1998?

 (a) 254650
 (b) 294840

 (c) 321470
 (d) 341200

 Answer: B
 Explanation:

 Number of males in U.P. = $\left[\frac{3}{5} of (15\% of 3276000)\right]$

$$=\frac{3}{5} \times \frac{15}{100} \times 3726000$$

= 294840

Question 24

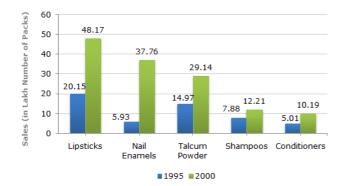
If in the year 1998, there was an increase of 10% in the population of U.P. and 12% in the population of M.P. compared to the previous year, then what was the ratio of populations of U.P. and M.P. in 1997?

(a) 42:55 (b) 48: 55 (c) 7:11 (d) 4: 5 Answer: A Explanation: Let x be the population of U.P. in 1997. Then, Population of U.P. in 1998 = 110% of $x = \frac{110}{100} \times x$. Also, Let y be the population of M.P. in 1997. Then, Population of M.P. in 1998 = 112% of $y = \frac{112}{100} \times y$. Ratio of population of U.P. and M.P. IN 1998 = $\left(\frac{\frac{110}{100} \times x}{\frac{112}{100} \times y}\right) = \frac{110x}{112y}$ From the pie-chart, this ratio is $\frac{15}{20}$ $\frac{110x}{112y} = \frac{15}{20} \xrightarrow{x} = \frac{15}{20} \times \frac{112}{110} = \frac{42}{55}$ Thus, ratio of populations of U.P. and M.P. in 1997 = x : y = 42 : 55

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Direction (for Q. Nos. 25 - 29):

A cosmetic company provides five different products. The sale of these five products (in lakh number of packs) during 1995 and 2000 are shown in the following bar graph Sales (in lakh number of packs) of five different products of cosmetic company during 1995 and 2000



 Question 25

 Enamels in 2000? (Rounded off to nearest integer)

 (a) 33%
 (b) 31%

 (c) 28%
 (d) 22%

 Answer: C

 Explanation:

 Required percentage = $\left[\frac{(48.17-37.76)}{37.76} \times 100\%\right]$

 = 27.57%

 = 28%

Question 26During the period 1995-2000, the minimum rate of increase in sales is in the case of?(a) Shampoos(b) Nail enamels(c) Talcum powders(d) LipstickAnswer: AExplanation:The percentage increase from 1995 to 2000 for various products isLipsticks = $\left[\frac{(48.17-20.15)}{20.15} \times 100\right]\% = 139.06\%$ Nail enamels = $\left[\frac{(37.76-5.93)}{5.93} \times 100\right]\% = 536.76\%$ Talcum powder = $\left[\frac{(29.14-14.97)}{14.97} \times 100\right]\% = 94.66\%$

Shampoos = $\left[\frac{(12.21-7.88)}{7.88} \times 100\right]\%$ = 54.95% = 55%

Conditions = $\left[\frac{(10.19-5.01)}{5.01} \times 100\right]$ % = 103.39%. ∴ The minimum rate of increase in sales from 1995 to 2000 is in the case of shampoos.

Question 27

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What is the approxim	te ratio of the sales of nail enamels in 2000 to the sales of Talcum
powder in 1995? (a) 7:2 (c) 4:3 Answer: B Explanation: Required ratio $= \frac{37.76}{14.97} =$	(b) 5:2 (d) 2:1
$\frac{1}{14.97} = \frac{1}{14.97}$	$\frac{1.5}{2}$
The sales have increa (a) Lipstick (c) Talcum powders Answer: D Explanation:	ed by nearly 55% from 1995 to 2000 in the case of? (b) Nail enamels (d) Shampoos e from 1995 to 2000 for various products is: 100]% = 139.06%
Nail enamels = $\left[\frac{(37.76-5)}{5.93}\right]$	$\frac{13}{3} \times 100]\% = 536.76\%$
Talcum powders = $\left[\frac{(29.7)}{2}\right]$	$\frac{4-14.97}{4.97} \times 100]\% = 94.66\%$
Shampoos = $\left[\frac{(12.21 - 7.88)}{7.88}\right]$	$\times 100$]% = 54.95% = 55%
Conditioners = $\left[\frac{(10.19-5)}{5.01}\right]$	$\frac{10}{10} \times 100]\% = 103.39\%$
1995? (Rounded off to (a) 57% (c) 29% Answer: B Explanation:	(b) 36% (d) 25%
	<u>7.88</u> × 100]% 6.42% 6%.
<u>Question 30</u> Following are the wei	hts in kgs. Of 36BBA students of khalsa college.
70 73 49 59 68 45 70 70 57 65 70 65 Find range from this s	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

(a) 6

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(b) 5

(c) 7 (d) 9 Answer: A Explanation: We have, range = Maximum weight = Minimum weight = 73 kgs, - 44kgs. = 29 kgs. No. of class interval × class lengths = Range No. of class interval × 5 = 29 No. of class interval = $\frac{29}{5}$ = 6. (We always take the next integer as the number of class intervals so as to include both the minimum and maximum values).

Question 31

Which of the following statements is false?

- (a) Statistics is derived from the Latin word 'status'
- (c) Statistics is derived from the French word 'Statistic'

(b) Statistics is derived from the Italian word 'Statista'(d) None of these

Answer: C

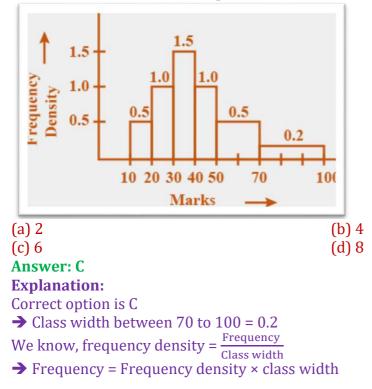
Explanation:

The term statistics is ultimately derived from the new Latin statisticum collegiums (" council of state") and the Italian word Statista ("statesman" or "politician") Thus, the original principal purpose of statistic was data to be used by governmental and (often centralized) administrative bodies

Question 32

The given histogram shows a frequency distribution of marks obtained by 56 students in a subject.

Number of students securing marks between 70 and 100 is:



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→ Frequency = $0.2 \times 30 = 6$
\therefore Number of students securing marks between 70 and 100 = 6

Question 33

The numbers of times a particular observation occurs in a given data is called its _____. Fill in the blanks to make statements true.

(b) Interval

(d) Frequency

- (a) Range
- (c) Raw data

Answer: D

Explanation:

Frequency of a value (observations) is defined by the number of time s the value occurs is a given data set. For example: 3, 3, 5, 5, 6, 7, 7, 7, 7, 7 In the above data set – 3 occur 2 times, then 2 is the frequency of 3 5 occurs 3 times, then 3 is the frequency of 5

6 occurs 1 time, then 1 is the frequency of 6 7 occurs 4 times, then 4 is the frequency of 7

Therefore, the number of times a particular observation occurs is a given data set is called its frequency.

Question 34

Which of the following is calculated using mid-values of classes?

	0	0	
(a) Mean			(b) Median
(c) Mode			(d) Range
Answer: A			

Explanation:

Mean is calculated using the mid-values of classes.

Question 35

The mean of 10 numbers is 7. If each number is multiplied by 12, find the mean of new set of numbers.

(a) 82	(b) 48
(c) 78	(d) 84
Answer: D	
Explanation:	
Total of 10 numbers = 10×7 = 70	
If each number is multiplied by 12	
New total = 70×12	
70×12	

: New mean	$-70 \times 12 - 04$
New mean	$=$ $\frac{10}{10} = 84$

Question 36

The mean of 9, 11, 13, p, 18 and 19 is p. Find the value of 'p'. (a) 12 (b) 13 (c) 14 (d) 15 Answer: C Explanation: The given numbers are 9, 11, 13, p, 18, 19 \Rightarrow Number of observations = 6

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 \Rightarrow Mean = p $\therefore p = \frac{9+11+13+p+18+19}{6}$ $\therefore \mathbf{p} = \frac{70+p}{6}$ ∴ 6p = 70 +p $\therefore 5p = 70$ $\therefore p = 14$

Ouestion 37

What is the value of 'n' If the mean of first 9 natural numbers is $\frac{5n}{2}$?

(a) 7 (b) 8 (c) 9 (d) 11 **Answer: C Explanation**: Mean of first 9 natural numbers = $\frac{1+2+\dots+9}{9}$ $\frac{45}{9} = 5$ Given mean of first 9 natural numbers is $\frac{5n}{9}$ $\frac{5n}{9} = 5$ $n = \frac{9 \times 5}{5} = 9$ **Ouestion 38** In the set above, which is larger: the median the mean, or the mode? (b) Median (a) Mean (c) All are equal (d) Mode **Answer:** A

Explanation:

Begin by ordering the set from smallest to largest: 6, 7, 8, 8, 9, 10, 11, 12 Already, we see that the mode is 8. Find the median by taking the average of the two middle numbers. 8 + 92 = 8.5Find the mean by adding all numbers and dividing by the total numbers of terms;

6 + 7 + 8 + 8 + 9 + 10 + 11 + 128 = 8.875

of the three, the mean of the set is the largest.

Ouestion 39

Column A. The mean of the sample of numbers 2, 5, and 10. **Column B** The mean of the sample of numbers 1, 5, and 15. (a) The quantity in column B is greater(b) The quantity in Column A is greater.(c) The two quantities are equal.(d) The relationship cannot be determin (c) The two quantities are equal.

(d) The relationship cannot be determined from the information given.

Answer: A Explanation:

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The arithmetic mean is the average of the sum of a set of numbers divided by the total number of numbers in the set. This is not to be confused with median or mode.

In Column A, the mean of 5.66 is obtained when the sum (17) is divided by the number of values in the set (3).

In column B, the mean of 7 is obtained when 21 is divided by 3. Because 7 is greater than 5.66, column B is greater. The answer is column B.

Question 40

The median of a given frequency distribution is found graphically with the help of _.

(a) Histogram(c) Frequency polygon

(b) Frequency curve(d) Ogive

Answer: D

Explanation:

Ogive or cumulative frequency curve is used to find the median.

Question 41

'More than' ogive is ___.

- (a) an ascending curve
- (c) first ascending curve and then descending curve

(b) a descending curve(d) First descending curve and them I

ascending curve

Answer: B

Explanation: 'More than' ogive is a descending curve.

Question 42

IN A VILLAGE OF 200 FARMS, A STUDY CONDUCTED FIND THE CROPPING PATTERN. Out of the 50 farms surveyed 50% grew only wheat. Identify the population and the sample here.

(a) The sample population is 200 farms

- (c) The sample population is 10 farms.
- (b) The sample population is 5 farms
- (d) The sample population is 50 farms

Answer: D

Explanation:

Population or the universe is statistics means totality of the items under study. So, the population here is 200 farms. Sample refers to a group or selection of the population from which information is to be obtained. Out of 200 farms, only 50 farms are selected fro survey. Therefore, the sample population is 50 farms.



<u>MAY 2018</u>

Question 1

Frequency density is used in the construction of

(a) Histogram(b) Ogive(c) Frequency polygon(d) None when the classes are of unequal width

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Answer: A

Explanation:

Frequency density is used in the construction of histogram

Question 2

Divided bar chart is considered for

(a) Comparing different components of a (b) The relation of different components variable (c) None

Answer: D

to the table (d) (a) and (b)

Explanation:

Divided bar chart is considered for comparing different components of a variable and the relation of different components to the table

NOV 2018

Question 1

The following frequency distribution

X	12	17	24	36	45
F	2	5	3	8	9

Is classified as:

(a) Continuous distribution

(c) Cumulative frequency distribution

(b) Discrete distribution (d) None of the above

Answer: c

Explanation:

X	12	17	24	36	15
F	2	5	3	8	9

Is classified as discrete distribution.

Ouestion 2

Histogram is useful to determine graphically the value of

(a) Arithmetic mean

(b) Median

(c) Mode

Answer: C

(d) None of the above

Explanation:

Histogram is useful to determine graphically the value of "mode"

Question 3

Data are said to be _____if the investigator himself is responsible for the collection of the data.

(a) Primary data	(b) Secondary data
(c) Mixed of primary and Secondary	(d) None of the above

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data

Answer: A

Data are said to be primary data if the investigator him responsible for the collection of the data.

Question 4

A suitable graph for representing the portioning of total info sub in statistics is statics is:

(a) A pie chart

(c) An ogive

(b) A pictograph(d) Histogram

Answer: A

Explanation:

A suitable graph for representing the portioning of total into parts in statistics is A pie chart.

Question 5

The number of times a particular item occurs in a class its

(a) Mean	(b) Frequency
(c) Cumulative frequency	(d) None

Answer: B

Explanation:

The number of times particular items occur in a class interval is called its frequency.

Question 6

An ogive is a graphical representation of

(a) Cumulative frequency distribution(b) A frequency distribution(c) Ungrouped data(d) None of the above

Answer: A

Explanation: An 'O' give is a graphical representation of cumulative frequency distribution.

<u>Question7</u>						
class	0-10	10-20	20-30	30-40	40-50	
Frequency	4	6	20	8	3	
For the class 20-30. Cumulative frequency is:						
(a) 10			(b) 26			
(C) 30			(d) 41			
Answer: C						
Explanation :						
C.I F C.F						
0-	10	4	4 4			
10-	-20	(6	1	0	

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20-30	20	30			
30-40	8	38			
40-50	3				
Cumulative frequency of cla	ass Interval '20-30' is 30				
	<u>MAY 2019</u>				
Question 1					
Series is contin	uous.				
(a) Open ended	(b) Exclusive	9			
(c) Close ended	(d) Unequal	call intervals			
Answer: B					
Explanation:					
Continuous series means w	here frequencies are given	along with value of the va	riable		
in the form of class interval	s. For example, here:20	is the lower and 30 the upp	ber		
limit 20-30 class interval.					
Question 2	and the sector bills. Compared to				
Which of the following gr	—		lon?		
(a) Ogives	(b) Histogram	m			
(c) G.M Answer: A	(d) A.M				
Explanation: An ogive is type of frequence	a nolygon that shows cum	ulative frequencies. In othe	or		
words, the cumulative perc		-	CI		
words, the cumulative perc	cht are added on the grapt	i ii oiii the left to right.			
Question 3					
Histogram is used for find	ling				
(a) Mode	(b) Mean				
(c) Median	(d) None				
Answer: A					
Explanation:					
A histogram is used for con		ns represent ranges of data	a, while		
a bar chart is plot of categorical variables.					
Question 4					
Ogive graph is used for finding					
(a) Mean	(b) Mode				
(c) Median	(d) None				
Answer: C					
Explanation: Determined the median graphically from the data given below. Cumulative frequency					
Determined the median graphically nom the data given below. Cumulative frequency					
			13. 21		

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curve is also known as OGIVE. The point on the x – axis, at which the perpendicular drawn from the intersection of two ogives meet. Determines are median.

<u>Question 5</u>

Histogram can be shown as

(a) Ellipse (c) Hyperbola

Answer: B

(b) Rectangle(d) Circle

Explanation:

A histogram is a diagram consisting of rectangles whose area is proportional to the frequency of a variable and whose width is equal to the class interval... these graphs shown on a histogram.

<u>NOV 2019</u>

Question 1

The graphical representation of cumulative frequency distribution is called.

(a) Histogram	(b) Hysterogram
(c) Ogive	(d) None

Answer: C

Explanation:

A curve that represents the cumulative frequency distribution of a grouped data on a graph is called ogive. Cumulative frequency on y-axis

Class interval on x-axis.

DEC 2020

Question 1

The average of salaries in a factory is Rs.47, 000. The statement that the average salary Rs.47, 000 is ____

(a) Descriptive statics

(c) Detailed **Answer: A**

(b) Inferential (d) Undetailed

Explanation:

Descriptive statistics are brief descriptive coefficients that summarize a given data set, which can be either a representation of the entire or a sample of a population. Descriptive statistics are broken down into measures of central tendency and measures of variability (spread).

Question 2 Statistics cannot deal with _____ data.

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(a) Quantitative (c) Textual **Answer: C**

Explanation:

Textual data refer to systematically collected material consisting of written, printed, or electronically published words, typically either purposefully written or transcribed from speech. Text collected for use as data typically reflects a conscious research purpose, motivated by a ... Entry. Data, Spatial.

(b) Qualitative

(d) Attribute

Ouestion 3

Sweetness of a sweet dish is _____

(a) Attribute

(c) Continuous Variable

(b) Discrete Variable (d) Variable

Answer: A **Explanation**:

An attribute refers to the quality of a characteristic. The theory of attributes deals with qualitative types of characteristics that are calculated by using quantitative measurements. Therefore, the attribute needs slightly different kinds of statistical treatments, which the variables do not get. Attributes refer to the characteristics of the item under study, like the habit of smoking, or drinking. So 'smoking' and 'drinking' both refer to the example of an attribute.

Question 4

Census reports are used as a source of _____ data. (b) Primary

(a) Secondary

(c) Organize

Answer: A

Explanation:

Secondary data is the data that has already been collected through primary sources and made readily available for researchers to use for their own research. It is a type of data that has already been collected in the past.

(d) Confidential

Question 5

Types of cumulative frequencies are _____

(a) 1	(b) 2
(c) 3	(d) 4
A D	

Answer: B

Explanation:

There are two types of Cumulative Frequency Curves (or Ogives) :

- 4 More than type Cumulative Frequency Curve.
- . Less than type Cumulative Frequency Curve

Question 6

You are an Auditor of a firm and the firm earns a profit Rs.67, 000/- you stated to them that the annual profit is Rs. 67,000. This is _____ type of statistics.

(a) Descriptive

(c) Non detailed

Answer: A

Explanation:

Descriptive - What are the 3 main types of descriptive statistics? The 3 main types of descriptive statistics concern the frequency distribution, central tendency, and variability of a dataset. Distribution refers to the frequencies of different responses. Measures of central tendency give you the average for each response.

Question 7

They _____ are used usually when we want to examine the relationship between two variables.

(a) Bar Graph

(c) Line Chart

Answer: D

Explanation:

Scatter Plot a graph in which the values of two variables are plotted along two axes, the pattern of the resulting points revealing any correlation present.

Question 8

Decomposition of time series is known as _____

(a) Detrending (c) Analysis of time series

(b) Histogram (d) Historiagram

Answer: a **Explanation**:

Decomposition of time series is known as Detrending

JAN 2021

Ouestion 1

A bar chart is drawn for

- (a) Continuous data
- (c) Time series data

(b) Nominal data (d) Comparing different components

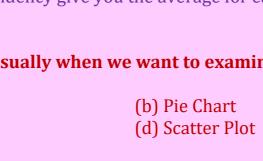
Answer: D Explanation:

A bar diagram makes it easy to compare sets of data between different groups at a glance. The graph represents categories on one axis and a discrete value in the other. The goal is to show the relationship between the two axes. Bar charts can also show big changes in data over time.

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(b) Detailed (d) Inferential



Question 2 A tabular presentation can be used for

(a) Continuous data(c) Time Series data

(b) Nominal data(d) Comparing different components

Answer: B Explanation:

Data Tables or Tabular Presentation. A table facilitates representation of even large amounts of data in an attractive, easy to read and organized manner. The data is organized in rows and columns. This is one of the most widely used forms of presentation of data since data tables are easy to construct and read.

Question 3

A variable with qualitative characteristics is known as

(a) Quality variable(c) A discrete variable

(b) an attribute (d) A continuous variable

Answer: B

Explanation: A qualitative variable, also called a

A qualitative variable, also called a categorical variable, is a variable that isn't numerical. It describes data that fits into categories. For example: Eye colors (variables include: blue, green, brown, hazel).

Question 4

The accuracy and consistency of data can be verified by

(a) Scrutiny(c) External Checking

(b) Internal checking(d) Double Checking

Answer: A

Explanation:

The accuracy and consistency of data can be verified by. Internal checking. External checking. <u>Scrutiny</u>.

Question 5

From a histogram one cannot compute the approximate value of

(a) Mode

(c) Median

(b) Standard deviation(d) Mean

Answer: B

Explanation:

A standard deviation is a statistic that measures the dispersion of a dataset relative to its mean and is calculated as the square root of the variance. ... If the data points are further from the mean, there is a higher deviation within the data set; thus, the more spread out the data, the higher the standard deviation. Hence From a histogram one cannot compute the approximate value of Standard deviation

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Question 6

The left part of a table providing the description of rows is called

(a) Caption

Answer: C

(c) Stub

(b) Box – head (d) Body

Explanation:

Stub is the left part of the table providing the description of the rows. Body: The body is the main part of the table that contains the numerical figures.

(b) Histogram

(d) All of the above

Question 7

Mode can be obtained from _____

(a) Frequency polygon

(c) Ogive

Answer: B

Explanation:

The mode of a frequency distribution can be determined graphically from HISTOGRAM . HISTOGRAM: Histogram is the graphical representation of a grouped frequency distribution in exclusive form with continuous classes in the form of rectangles with class intervals as bases and the corresponding frequencies as heights

Question 8

Most of the commonly used distributions provide a

(a) Bell-shaped	(b) U – shaped
(c) J – shaped curve	(d) Mixed curve
Anower A	

Answer: A

Explanation:

Normal distribution, also called Gaussian distribution, the most common distribution function for independent, randomly generated variables. Its familiar bell-shaped curve is ubiquitous in statistical reports, from survey analysis and quality control to resource allocation.

Question 9

Which of the following is suitable for the graphical representation of a cumulative frequency distribution?

	-	
(a) Frequency	poly	gon
(c) Ogive		

(b) Histogram(d) Pie chart

Answer: C

Explanation:

A curve that represents the cumulative frequency distribution of grouped data is called an ogive or cumulative frequency curve.

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FOR ENQUIRY - 6262969604

Ouestion 10 Sweetness of sweet dish is

(a) An Attribute

(c) A continuous variable

Answer: A

Explanation:

An attribute is defined as a quality or characteristic of a person, place, or thing. Real life individuals and fictional characters possess various attributes. For example, someone might be labeled beautiful, charming, funny, or intelligent, Sweetness of sweet dish

(b) A discrete variable

(d) A variable

JULY 2021

Ouestion 1

There were 200 employees is an office in which 150were married. Total male employees were 160 out of which 120 were married. What was the number of female unmarried employees?

(a) 30	(b) 40
(c) 50	(d) 10
Answer: Options (d)	
Explanation	
Total Female Employee = 200-160 = 40	
Total Female Married = 150-120 = 30	
Total Female Unmarried = 40-30 = 10	
Ans: Female Unmarried Employees = 10	

Ouestion2

Data collected on religion from the census reports are

(a) Primary data (c) Sample data **Answer: Options (d)** (b) Unclassified data (d) Secondary data

Explanation

Data collected on religion from census reports are secondary data. Secondary data is the second-hand information as it is not collected by the user. Thus, secondary data refers to the data which is already collected and published by other authorities. For example, government census report is a secondary data.

Question 3

Which of the following diagram the most appropriate is to represents various heads in total cost?

(a) Pie chart
(c) Multiple line chart
Answer: Options (a)

(b) Bar graph (d) Scatter plot 6262969699

6262969699

Explanation Different diagram patterns represent different kinds of data. However, here we are concerned about the monthly expenditure of different items bought by a family and a pie diagram would do proper justice to it. A pie diagram is circular as its name suggests and it is divided into various sections which differ on the data which is being dealt with. The length of the arc in each section usually refers to the quantity. It is usually used to show data that can be represented in a percentage format. **Ouestion 4** In a graphical representation of data, the largest numerical value is for is the smallest numerical value is 25. If classes desired are 4 then which interval is (a) 45(b) 5(c) 20(d) 7.5 **Answer: Options (b) Explanation**: In a graphical representation of data, the largest numerical value is for is the smallest numerical value is 25. If classes desired are 4 then which interval is 5 **Ouestion 5** In a graphical representation of data, ideographs are also called as (a) Picto-graphs (b) Asymmetry graphs (c) Symmetry graphs (d) Pictograms **Answer: Options (d) Explanation**: A pictogram, also called a pictograms, pictograph, or simply picto, and in computer usage an icon, is a graphic symbol that conveys its meaning through its pictorial resemblance to a physical object. **Ouestion 6** Means separating items according to similar characteristics groping then into various classes (a) Classification (b) Editing (c) Separation (d) Tabulation **Answer: Options (a) Explanation**: Classification means separating items according to similar characteristics and grouping them into various classes. **Ouestion 7**

Frequency density of a class interval is the ratio of_ (a) Class frequency to the total frequency (b) Class length to class frequency

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FOR ENQUIRY – 6262969604	6262969699
 (c) Class frequency to the cumulative frequency Answer: Options (d) Explanation: 	(d) Frequency of that class interval to the corresponding class length
Frequency density of a class interval may that class interval to the corresponding of	y be defined as the ratio of the frequency of class length. To have better understanding on us consider the frequency distribution given y
Question 8 A graph that uses vertical bars to repr	resent data is called a
(a) Line graph	(b) Scatter plot
(c) Vertical graphs	(d) Bar graphs
Answer: Options (d)	
Explanation: A bar chart or bar graph is a chart or gra	ph that presents categorical data with
	proportional to the values that they represent.
	izontally. A vertical bar chart is sometimes
called a column chart.	
Question 9	
In normal distribution, Mean, Median	and Mode are
(a) Zero	(b) Not equal
(c) Equal	(d) Null
Answer: Options (c)	
Explanation:	l distribution are equal. The area under the
	ributions are denser in the centre and less
dense in the tails.	
DE	<u>C 2021</u>
Question 1	
In a study about the male and female	
departments of a college in 5 years, th 1995	e following data's were obtained: 2000
70% female students	2000 75% female Students
	40% read Science

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20% male students read science	50% of female Students read commerce			
3000 total No. of students	3600 total No. of students			
After combining 1995 and 2000 if x denotes the ratio of the female commerce				
students to female science student and y denotes the ratio of male commerce				
student to male science student, then				

(a)) x=y
(C)	x < y

(b) x > y (d) x≥y

Answer: c

Explanation:

The entire data can be summarized as follows:

Particulars	1995		2000	
No. of Students		3,000		3,600
No. of Female Students	(70%×3,000)	2,100	(75%×3,600)	2,700
No. of Male Students	(30%×3,000)	900	(25%×3,600)	900
No. of Commerce Students	(65%×3,000)	1950	(60%×3,600)	2160
No. of Science Students	(35%×3,000)	1050	(40%×3,600)	1440
No. of Male Science Students	(20%×3,000)	180	(900-810)	90
No. of Male Commerce	(80%×3,000)	720	(2160 – 1350)	810
Students				
No. of Female Science	(1,050-180)	870	(50% × 2,700)	1350
Students				
No. of Female Commerce	(1950 - 720)	1230		1350
Students				

Total female commerce students = 1230 + 1350 = 2580

Total Female science students = 870 + 1350 = 2220

Therefore, $x = \frac{2,580}{2,220} = 1.1622$

Total male commerce students = 720 +810 = 1530 Total male science students = 180 + 90 = 270

Therefore, $y = \frac{1,530}{270} = 5.6667$ Clearly, x<y.

Question 2

A National Institute arranged its students data in accordance with different states. This arrangement of data is known as

(a) Temporal Data(c) Geographical Data

(b) Ordinal Data(d) Cardinal Data

Answer: b Explanation:

Data arranged in accordance with states is Geographical data.

Question 3

A student marks in five subject S1, S2, S3, S4 and S5 are 86, 79, 90, 88 and 89. If we need to draw a Pie chart to represent these markes, then what will be the Central angle for S3?

(a) 103.2° (b) 75° (c) 105.6° (d) 94.8°

Answer: b

Explanation: Total Marks = 86 + 79 + 90 + 88 + 89 = 432Marks in S3 = 90 Central Angle = $\frac{90}{432} \times 360 = 75^{\circ}$

Question 4

Ogive curves cannot be used to determine

(a) Mean	(b) Mode
(c) Median	(d) Range

Answer: b

Explanation:

This question seems to be wrong. The correct question should be "Ogive curves can be used to determine:" The answer would then be (b) Median.

Question 5

The following data relate to the marks of a group of students:

O					
Marks	Below 10	Below 20	Below 30	Below 40	Below 50
No. of students	15	38	65	84	100
How many students got marks more than 30?					
(a) 65		(b)	50		
(c) 35		(d)	43		

Answer:

Explanation:

From the table it iS clear that total number of students = 100, and the number of students who got marks below 30 = 65.

Therefore, number of students who got marks more than 30 = 100 - 65 = 35.

Question 6

The following data relate to the marks 48 students in statistics:

56	10	54	38	21	43	12	22
48	51	39	26	12	17	36	19

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13.31

FOR ENQUIRY - 6262969604 6262969699 33 30 57 48 36 15 62 17 5 55 38 17 45 46 43 57 54 43 28 32 35 27 17 16 45 11 43 45 2 16 46 28 What are the frequency densities for the class intervals 30-39, 40-49, 50-59? (a) 0.20, 0.50, 0.90 (b) 0.1875, 0.1667, 0.2083 (c) 0.70, 0.90, 1.10 (d) 0.90, 1.00, 0.80 Answer: d **Explanation**: Frequency Density = <u>Class Frequency</u> Class Lenath **Class Interval Observations** Frequency 30 - 39 9 38, 39, 36, 33, 30, 38, 32, 35 40 - 4943, 48, 48, 45, 46, 43, 43, 43, 11

Therefore, Frequency Density for the Class interval 30-39 = 9 / 10 = 0.90Frequency Density for the class interval 40.49 = 11/10 = 1.10Frequency density for the class interval 5059 = 7 / 10 = 0.70.

56, 54, 51, 57, 55, 57 54

45, 46, 45

Ouestion 7

50 - 59

Multiple axis line chart is considered when

(c) In any case.

(a) There is more than one time series (b) The Units of the variables are different. (d) If there are more than one time series and unit of variables are different.

7

Answer: d

Explanation:

If there are more than one time series and unit of variables are different then multiple Axis line chart is considered.

JUNE 2022

Ouestion 1

Less than 'o' give curve give -

(a) Mean (c) Mode (b) Median (d) MD

Answer: b **Explanation**:

Less than 'o' give curve gives Median.

Ouestion 2

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If a data collected from a census Report.	What type of data it is :-
(a) Time series data	(b) Primary data (d) Coographical data
(c) Secondary data	(d) Geographical data
Answer: Explanation:	
If a data collected from a census report is k	nown as secondary data.
Question 3	
Sweetness is an	
(a) Attribute	(b) Quality
(c) Quantity	(d) None of these
Answer: d	
Explanation: Sweetness is an Attribute (quality)	
Sweethess is an Attribute (quality)	
Question 4	
Which of the following is not a way of Pr	-
(a) Tabular form (c) Graphical form	(b) Textual form(d) None of these
Answer: d	
Explanation:	
Regression Analysis is not a way of Present	ing data.
Question 5	
Histogram can be drawn from	
(a) Class interval are equal	(b) Class interval are unequal
(c) Frequency of class interval are equal	(d) None
Answer: a	
Explanation: Histogram can be drawn from class Interva	l are equal.
Question 6 Which of following does not form charac	teristics in dividing the data?
(a) No. of auditors auditing Accounts	(b) No. of files audited by auditor
(c) No of files audited less than 6, less	(d) Files less than, moderate than, higher
than , less than 10	than
Answer: d	
Explanation: Files less than, moderate than, higher than	does not form characteristics in dividing the
data.	

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Question 7

If the cumulative frequency are plotted on axis then which type of curve is formed

(a) Ogive (c) Histogram (b) Frequency curve

(d) Frequency Polygon

Answer: a

Explanation: 'O' Give [: C.F is used for constructed 'O' Give]

Ouestion 8

Which one is research data? (a) Discrete and Continuous

- (c) Processed and Unprocessed
- (b) Qualitative and Quantitative
- (d) Organise and unorganised data

Answer: c

Explanation: Processed and unprocessed data is a research data.

Ouestion 9

The profitability of a blue chip company is shown by -

(a) bell shape curve (c) J shape curve

(b) U shape curve (d) Mixed curve

Answer:

Explanation:

The profitability of a blue chip company is shown by bell shape Curve.

DEC 2022

Ouestion 1

Which one of the following is a source of primary data?

- a) Government records
- b) Research Articles

c) Journals

Answer: Options (a)

d) Ouestionnaire filled by enumerators

Explanation:

Public records produced from federal, state, local and international governments or intergovernmental organizations (NGOs) provide primary source material beneficial to nearly all research interests.

Question 2

_____ is based on all the observations and ______ is based on the central fifty percent of the observations

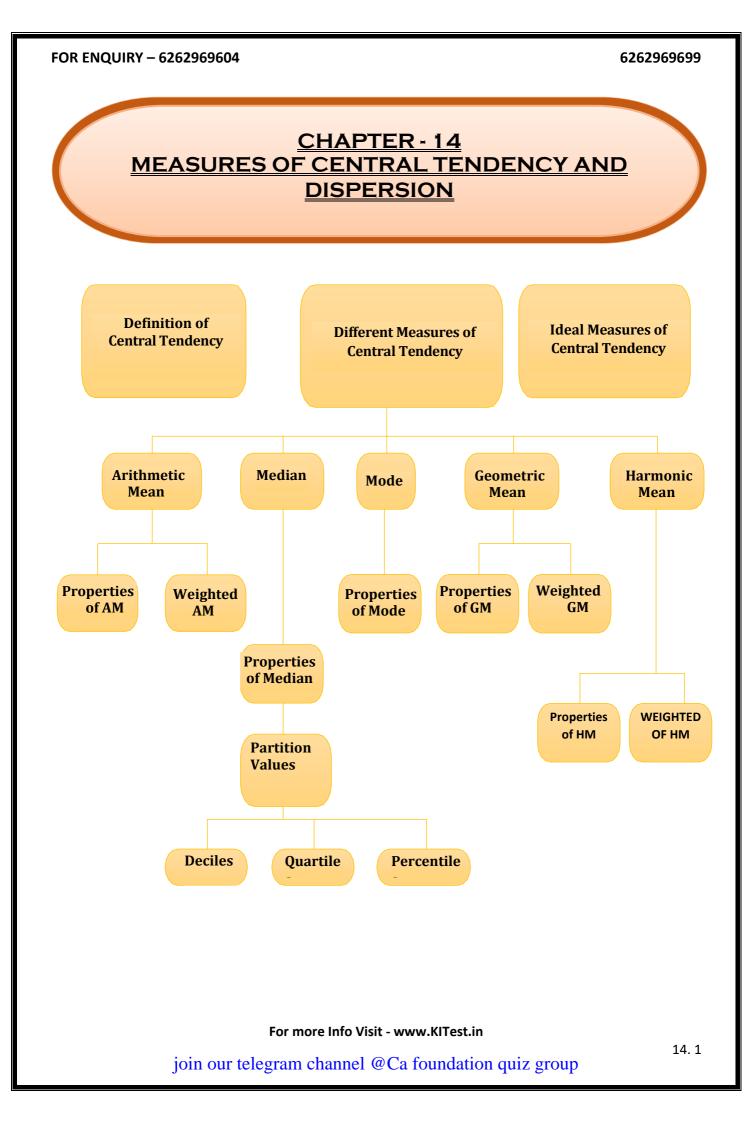
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FOR ENQUIRY – 6262969604	6262969699
a) Mean deviation, Range	b) Mean deviation, quartile deviation
c) Range, standard deviation	d) Quartile deviation, standard deviation
Answer: Options (d)	
Explanation:	
	vay to appraise the spread of a conveyance ination (more often than not the cruel). So, it nside which the central 50% of your test
Hence, Quartile deviation, standard de	eviation is Answer.
Question 2	
Question 3 Which is the left part of the table prov	iding the description of the rows?
a) Caption	b) Box head
c) Stub	d) Body
Answer: Options (d)	
Explanation:	
stub is a part of table which describes the	e rows situated in the left of a table
Question 4	
The suitable formula for computing th	
a) 3.322 logN	b) 0.322 logN
c) 1+3.322 logN	d) 1-3.322 logN
Answer: Options (c)	
Explanation: The number of classes given in the quest	ion is n and total frequency is N
We know that Sturges rule is used to find	
histogram or frequency distribution.	the number of classes which is used in a
From Sturges rule we can write.	
K=1+3.322logN	
Put the values of number of classes and t	otal frequency in the above equation.
Therefore, we will get	
n=1+3.322logN	
We can write the above equation as n=1+	-3.3logN.
Hence, the correct option is (C).	
Question 5	
Ogive for more than type and less than	
a) Mean	b) Median
c) Mode	d) Origin
Answer: Options (b) Explanation:	
Елріанаціїн	

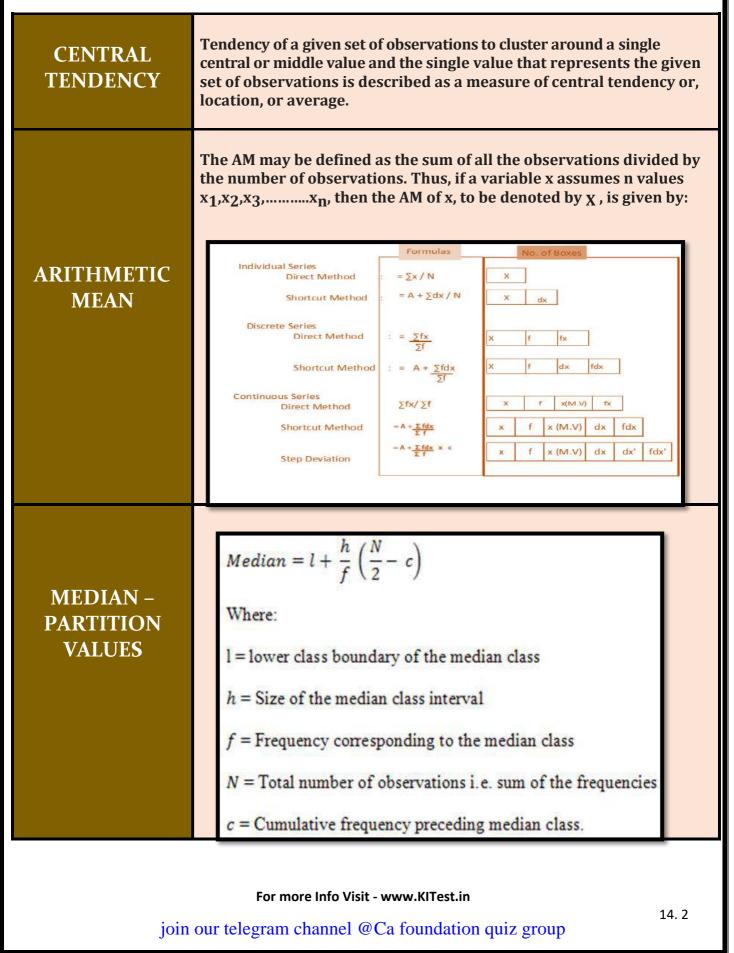
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In Ogive for more than type and less than type of distribution intersect at Median.

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UNIT I: MEASURES OF CENTRAL TENDENCY



FOR ENQUIRY – 626296	9604 6262969699			
Types of median	Calculation of Quartiles, Deciles and Percentiles• For Continuous Series• Formula to be used in continuous series:1. Q_1 =Size of N/4th item• Formula to be used in continuous series:2. Q_3 = Size of 3N/4th item• D_1 =Size of N/10th item3. D_1 =Size of N/10th item1. Q_1 =L1+N/4-c.f*i/f4. D_9 =Size of 9N/10 item3. D_1 =L1+N/10-c.f*i/f5. P_1 = Size of N/100th 			
Mode	Formula of Mode : $Z = l_1 + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times i$ where, $Z = \text{value of Mode}$ $l_1 = \text{lower limit of modal class}$ $f_0 = \text{Frequency of the preceding modal class}$ $f_2 = \text{Frequency of the subsequent modal class or post modal class}$ $i = \text{Class interval of the modal class}$			
GEOMETRIC MEAN & HARMONIC MEAN& WEIGHTED MEAN	Geometric Mean: $GM = \sqrt[n]{\prod_{i=1}^{n} x_i} = \sqrt[n]{x_1 x_2 x_3 \dots x_n}$ Harmonic Mean: $HM = \frac{n}{\sum_{i=1}^{n} \frac{1}{x_i}} = \frac{n}{\frac{1}{x_1} + \frac{1}{x_2} + \frac{1}{x_3} + \dots + \frac{1}{x_n}}$ Weighted Mean: $WM = \frac{\sum_{i=1}^{n} w_i x_i}{\sum_{i=1}^{n} w_i} = \frac{w_1 x_2 + w_2 x_2 + w_3 x_3 + \dots + w_n x_n}{w_1 + w_2 + w_3 + \dots + w_n}$			
Relationship between Mean, Median and	Mean – Mode = 3(Mean– Median) Mode = 3 Median – 2 Mean			
Relation between AM, GM, and HM	AM >GM >HM			
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Question 1

Relationship between Mean, Median and Mode

(a) Mean - Mode = 3(Mean - Median)(c) Both (a & b)

(b) Mode = 3 Median - 2 Mean(d) None of these

Answer: C Explanation:

If a frequency distribution is positively skewed, the mean is greater than median and median is greater than mode.

Question 2

If median – 20 and mean-22.5 in a moderately skewed distribution then compute approximate value of mode

(b) 20
(d) 30

<u>Question 3</u> A numerical value used as a summary measure for a sample, such as sample mean, is known as a

(a) Population parameter(c) Sample statistic

- (b) Sample parameter
- (d) population mean

Answer: C

Explanations:

If it pertains to sample it is called a statistic, if it pertains to population, it is called a parameter.

Question 4

<u>Question +</u>	without the communication theory the communication
	r than the sample size, then the sample statistic
(a) Can never be equal to the population	(b) Can never be zero
parameter	
(c) Can never be smaller than the	(d) None of the above answers is correct
population parameter	
Answer: D	
Explanation:	
Sample statistic will depend upon the samp population parameter. It can assume the va	le chosen. It can be less than, greater than, equal to lue of zero.

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Mu is an example of a	(h) Commission statistic
(a) Population parameter(c) Population variance.	(b) Sample statistic (d) Mode
Answer: A	(d) Mode
Explanation:	
M is a standard representation for populatio	n parameter.
Question 6	
The mean of a sample is	
(a) Always equal to the mean of the population	(b) Always smaller than the mean of the population
(c) Computed by summing the data values and dividing the sum by (n – 1)	(d) Computed by summing all the data values and dividing the sum by the number of items
Answer: D	
Explanation:	
Mean = Total of sample values/ sample size	
Question 7	
The sum of the percent frequencies for all	
(a) One	(b) The number of classes
(c) The number of items in the study Answer: D	(d) 100
Explanation:	
If we count the total frequency, it is equal to	the sample size n. $\frac{n}{n} \times 100 = 100$
<u>Question8</u>	
	ollowing is not used for data summarization
(a) The smallest value	(b) The largest value
(c) The median	(d) The 25 th percentile
Answer: D	
Explanation:	
The 25 th percentile	
Question 9	
Since the mode is the most frequently occ	
(a) Can never be larger than the mean	(b) Is always larger than the median
(c) Is always larger than the mean Answer: D	(d) None of the above answers is correct.
Explanation:	
The mean, median and mode values will be d	listributed according to the skewness of the
distribution. Accordingly, mode can be great	
Question 10	
Question 10	of 100 accidents during seven days of the

and four each of other days. Calculate the average number of accidents per day.

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Days	Sun	Mon	Tue	Wed	Thru	Fri	Sat.	Total
Number of	20	22	10	9	11	8	20	100
accidents								

(a) 14 (c) 17 **Answer: A**

Explanation:

Calculation of number of Accidents per day

(b) 12 (d) 19

Day	No. of Accidents (x)	No. of days in Month (f)	Total fx
Sunday	20	4	80
Monday	22	4	88
Tuesday	10	4	40
Wednesday	9	4	36
Thursday	11	4	44
Friday	8	5	40
Saturday	20	5	100
Total	100	N =30	$\Sigma fx = 428$

$$\sum fx 428$$

 $\frac{1}{N} = \frac{1}{30} = 14.27$

14 accidents per day

<u>Question 11</u>

Following are the daily wages in Rupees of a sample of 9 workers: 58, 62, 48, 53, 70, 52, 60, 84, 75. Compute the mean wage.

(a) 62.44	(b) 62.04
(c) 60.44	(d) 31.22
Answer: a	

Explanation:

Let x denote the daily wage in rupees. Then as given $x_1 = 58$, $x_2 = 62$, $x_3 = 48$, $x_4 = 53$, $x_5 = 70$, $x_6 = 52$,

 $X_7 = 60$, $x_8 = 84$ and $x_9 = 75$. Applying (15.1.1) the mean wage is

Given by, $=\frac{\Sigma xi}{\Sigma xi}$

n 58+62+48+53+70+52+60+84+75 9

 $\frac{562}{9} = 62.44$

Question 12

Find the AM for the following distribution:

class	350-369	370-389	390-409	410-429	430-449	450-469	470-489
interval							
Frequency	23	38	58	82	65	31	11

(a) 416

(b) 416.17

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(c) 416.71 Answer: C Explanation:

(d) 41.71

Class Interval	Frequency(f)	Mid-Value(x)	d= xi-A xi = -419.50	fx
(1)	(2)	(3)	(4)	$(5) = (2) \times (4)$
350 - 369	23	359.50	-3	-69
370 - 389	38	379.50	-2	-76
390 – 409	58	399.50	-1	-58
410 - 429	82	419.50	0	0
430 - 449	65	439.50	1	65
450 - 469	31	459.50	2	62
470 - 489	11	479.50	3	33
Total	308	-	-	-43

The required AM is given by

$$X=A + \frac{2fidi}{N} \times C$$

= 419.50+ $\frac{(-43)}{308} \times 20$
= 419.50 - 2.79
= 416.71

Question 13

The mean salary for a group of 40 female workers is Rs. 5200 per month and that for a group of 60 male workers is Rs. 6800 per month. What is the combined mean salary? (a) 6160 (b) 616

(d) 61.6

(a) 6160 (c) 6.16

Answer: A

Explanation:

As given $n_1 = 40$, $n_2 = 60$, $x_1 = Rs$. 5200 and

 $X_2 = Rs.6800$

Hence, the combined mean salary per month is

 $X = \frac{n_1 x_1 + n_2 x_2}{n_1 + n_2}$ 40 ×Rs.5200+60 ×Rs.6800

40 + 60

= 6160

Question 14

The sum of the deviation of a given set of individual observations from the arithmetic mean is always infinite. The statement is True or not?

(b) Incorrect

(d) None

(a) Correct

(c) Error

Answer: B

Explanation:

According to Mathematical properties of the Arithmetic Mean: The sum of the deviation of a given set of individual observations from the arithmetic mean is always zero. Symbolically = 0. It is due to this property that property the arithmetic mean is characterized as the center as the center gravity i.e., the sum of positive deviations from the mean is equal to the sum of negative deviations.

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Question 15

The mean age of a combined group of men and women is 30 years. If the mean age of the group of men is 32 and that of women group is 27. Find out the percentage of men and women in the group.

(a) 30%, 70% (c) 60%, 40% (b) 20%, 80% (d) 40%, 60%

Answer: C

Explanation:

Let us take group of men as first group and women as second group. Therefore = 32 years, = 27 years, and = 30 years. In the problem, we are not given the number of men and women. We can assume

N1 + N2 = 100 and therefore. N1 = 100 - N2 Apply = 30 = (Substitute N₁ = 100 - N₂) 30 × 100 = 32(100 - N₂) + 27N₂ or 5N₂ = 200 N₂ = $\frac{200}{5}$ = 40% N₁ = (100 - N₂) = (100 - 40) = 60%

Therefore, the percentage of men in the group is 60 and that of women is 40.

Question 16

Median and mode of the wage distribution are known to be Rs. 33.5 and 34 respectively. Find the third missing values.

Wages (Rs.)	No. of Workers
0-10	4
10—20	16
20-30	?
30-40	?
40-50	?
50-60	6
60-70	4
Total	230

(a) 6	(b) 10
(c) 9	(d) 40
A D	

Answer: D

Explanation:

We assume the missing frequencies as 20 - 30 as x, 30 - 40 as y, and 40 - 50 as 230 - (4 + 16 + x + y + 6 + 4) = 200 - x - y.

We now pr	oceed further	to compute	e missing fi	requencies:
non pr	00000 101 01101	to compare		equeneres

Wages (Rs.) x	No. of workers f	Cumulative frequencies cf
0-10	4	4
10-20	16	20
20-30	Х	20 + x
30-40	У	20 + x + y
40-50	200-х-у	220
50-60	6	226
60-70	4	230

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NI	_	າາ	ſ
IN	=	23	l

Apply median = 33.5 = Y(33.5 - 30) = (115-20-x) 103.5y = 1150 - 200 - 10x $10x + 3.5y = 950 \dots (i)$ Apply mode = 34 = 4(3y - 200) = 10(y - x) $10x + 2y = 800 \dots$ (ii) Subtract equation (ii) from equation (i), 1.5y = 150, y = 100Substitute the value of y = 100 in equations (i0, we get 10x + 3.5(100) = 95010x = 950-350 $X = \frac{600}{10} = 60$ Third missing frequency = 200 - x - y = 200 - 60 - 100 = 40.

Question 17

Calculate mode from the following data:

Marks	Frequency		
Below 10	4		
"20	6		
"30	24		
"40	46		
"50	67		
"60	86		
"70	96		
"80	99		
"90	100		

(a) 41.3	(b) 40
(c) 40.13	(d) 89

Answer: A

Explanation:

Since we are given the cumulative frequency distribution of marks, first we shall convert it into the normal frequency distribution:

Marks	Frequencies
0-10	4
10-20	6-4=2
20-30	24-6=18
30-40	46-24=22
40-50	67-46=21
50-60	86-67=19
60-70	96-86=10
70-80	99-96=3
80-90	100-99=1

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It is evident from the table that the distribution is irregular and maximum chances are that the distribution would be having more than one mode. You can verify by applying the grouping and analyzing table.

The formula to calculate the value of mode in cases of bio-modal distribution is:

Marks	Mid-Value	Frequency f	Cumulative frequencies	(dx)	fdx	
		-	cf			
0-10	5	4	4	-4	-16	
10-20	15	2	6	-3	-6	
20-30	25	18	24	-2	-36	
30-40	35	22	46	-1	-22	
40-50	45	21	67	0	0	
50-60	55	19	86	1	19	
60-70	65	10	96	2	20	
70-80	75	3	99	3	9	
80-90	85	1	100	4	4	
	405	$\Sigma f = 100$	528	0	$\Sigma fdx = -2$	

Mode = 3 median – 2 mean. Computation of Mean and Median

Mean =?

Median = size of item = 50^{th} item Because 50 is similar to 67 in C.f. column, Median class is 40 - 50Apply Mode = 3 median - 2 Mean Mode = $3 \times 41.9 - 2 \times 42.2 = 125.7 - 84.6 = 41.3$

Question 18

Find the arithmetic mean of the first 7 natural numbers.

(a) 5 (Ъ) 6
	(d) 4
Answer: D	
Explanation:	
The first 7 natural numbers are 1, 2, 3, 4, 5, 6 an	d 7.
Let x denote their arithmetic mean.	
Then mean = Sum of first 7 natural numbers/nu	mber of natural numbers
X = (1 + 2 + 3 + 4 + 5 + 6 + 7)/7	
= 28/7	
= 4	
Hence, their mean is 4.	
Question 19	
The heights of five runners are 160cm, 137 c	cm, 149 cm, 153 cm, and 161 cm
respectively. Find the mean height per runne	er.
(a) 152 ((b) 150

(c) 148 (d) 120 Answer: A Explanation: Mean height = Sum of the heights of the runners/number of runners $= \frac{(160+137+149+153+161)}{5cm}$

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 $=\frac{760}{5cm}$ = 152 cm. Hence the mean height is 152 cm.

Question 20

Find the mean of the first five prime numbers. (a) 4.6 (b) 6.5 (b) 78 (d) 5.6

Answer: D

Explanation:

The first five prime numbers are 2, 3, 5, 7 and 11. Mean = Sum of first five prime numbers/number of prime numbers $= \frac{(2+3+5+7+11)}{5}$ $= \frac{28}{5}$

= 5.6 Hence, their mean is 5.6

Question 21

Find the mean of the first six multiples of 4. (a) 12 (b) 13 (c) 14 (d) 15 Answer: C Explanation: The six multiples of 4 are 4, 8, 12, 16, 20, and 24. Mean = Sum of the first six multiples of $\frac{4}{\text{No.of multiple}}$ = $\frac{(4+8+12+16+20+24)}{6}$ = $\frac{84}{6}$ = 14.

Hence, their mean is 14.

Question 22

If the mean of 9, 8, 10, x, 12 is 15, find the value of x. (a) 30 (b) 41 (c) 36 (d) 63 Answer: C Explanation: Mean of the given numbers $= \frac{(9+8+10+x+12)}{5} = \frac{(39+x)}{5}$ According to the problem, mean = 15 (given). Therefore, $\frac{(39+x)}{5} = 15$ $\Rightarrow 39 + x = 15 \times 5$ $\Rightarrow 39 + x = 75$ $\Rightarrow 39 - 39 + x = 75 - 39$ $\Rightarrow x = 36$ Hence x = 36.

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Ouestion 23 If the mean of five observations x, x+4, x+6, x+8, and x+12 is 16, find the value of x. (a) 154 (b) 54 (d) 541 (c) 451 **Answer: C Explanation**: Mean of the given observations $-\frac{x + (x + 4) + (x + 6) + (x + 8) + (x + 12)}{(x + 12)}$ $=\frac{(5x+30)}{-}$ 5 According to the problem mean = 16 (given). Therefore, $\frac{(5x+30)}{5} = 16$ \rightarrow 5x + 30 = 16 × 5 $\rightarrow 5x + 30 = 80$ \rightarrow 5x + 30 - 30 = 80 - 30 \rightarrow 5x = 50 \rightarrow x = $\frac{50}{5}$ \rightarrow x = 10 Hence, x = 10. **Ouestion 24** The mean of 40 numbers was found to be 38. Later on, it was detected that a number 56 was misread as 36. Find the correct mean of given numbers. (a) 38 (b) 26 (d) 89 (c) 38.5 **Answer: C Explanation:** Calculated mean of 40 numbers = 38. Therefore, calculated sum of these numbers = $(38 \times 40) = 1520$. Correct sum of these numbers = [1520 - (wrong item) + (correct item)]=(1520 - 36 + 56)= 1540.Therefore, the correct mean = $\frac{1540}{40}$ = 38.5. **Ouestion 25** The mean of the heights of 6 boys is 152 cm. If the individual heights of five of them are 151 cm, 153 cm, 155 cm, 149 cm and 154 cm, find the height of the sixth boy. (a) 157 (b) 159 (c) 150 (d) 89 **Answer: C Explanation**: Mean height of 6 boys = 152 cm. Sum of the heights of 6 boys = $(152 \times 6) = 912$ cm Sum of the heights of 5 boys = (151 + 153 + 155 + 149 + 154) cm = 762 cm. Height of the sixth boy

= sum of the heights of 6 boys) – (sum of the heights of 5 boys)

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= (912-762) cm = 150 cm. Hence, the height of the sixth girl is 150 cm.

Question 26

Find the mod	e of the followi	ng set of mark	S.

Marks	1	2	3	4	5
Frequency	6	7	7	5	3

(a) 2 and 4	(b) 4 and 3
(c) 2 and 3	(d) 2 and 5

Answer: C

Explanation:

The marks 2 and 3 have the highest frequency. So, the modes are 2 and 3.

Note: The above example shows that a set of observation may have more than one mode.

Question 27

There are 8 number cards with values 0 – 7. Each time a card is drawn at random and the card value is recorded. The frequency refers to the number of times a value is shown.

Card values	0	1	2	3	4	5	6	7
Frequency	8	12	7	10	12	13	12	10

(a) 75,5

(c) 80, 89

Answer: A

(b) 5, 79 (d) None

Explanation:

(a) Mode: 75 kg (highest frequency of 12)

(b) Mode: 5 (highest frequency of 13)

Question 28

The following frequency table shows the marks obtained by students in a quiz. Given that 4 is the mode, what is the least value for x?

Marks	1	2	3	4	5	6
Number of students (frequency)	7	9	10	Х	9	11

(a) 12	(b) 10
(c) 3	(d) 6
Answer: A	

Explanation:

X is as least 12 (if x is less than 12 then 4 will not be the mode)

Question 29

The mean of the following frequency distribution is			
Class Interval Frequency			
0-10	4		
10-20	6		
20-30	10		
30-40	16		

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40-50	14
(a) 25	(b) 35

(d) 31

(c) 30

Answer: D

Explanation:

Mid-point	Freq.	Diff, from	fd
		(A = 25)	
5	4	-20	-80
15	6	-10	-60
25	10	0	0
35	16	10	160
45	14	20	280
Σf=50			$\Sigma fd = 300$
	5 15 25 35 45	5 4 15 6 25 10 35 16 45 14	Image: Second system Image: Amplitude Image: Amplitude Image: Amplitude 5 4 -20 15 6 -10 25 10 0 35 16 10 45 14 20

 $(x) = A + \frac{\Sigma FD}{\Sigma F} = 25 + \frac{300}{50} = 31$

Question 30

Mean of twenty observations is 15. If two observations 3 and 14 replaced by 8 and 9 respectively, then the new mean will be

(a) 14	(b) 15	
(c) 16	(d) 17	
Answer: D		
Explanation:		
Mean of 20 observations = 15		
\therefore Sum of 20 observations = $15 \times 20 = 3$	00	
Replacing 3 and 14 by 8 and 9 will mear	n that 3 + 14 = 17 is repla	aced by 8 + 9 = 17
	T. 111 1 000 11	

Hence there will be no effect on the sum. It will remain 300, so the mean will not change and will remain 15.

Question 31

Factory A	Factory B	
No. of wage of earners 250	200	
Average daily wage Rs. 2.00	Rs. 2.50	
The average of daily wages for the earn	ners of the two factories combined is	
(a) Rs. 2.12	(b) Rs. 2.06	
(c) Rs. 2.20	(d) Rs. 2.22	
Answer: D		
Explanation:		
Required average = $\frac{250 \times 2.00 + \times 2.50 \times 200}{250 \times 200}$		
$=\frac{1000}{250+200}$		
$=\frac{450}{20}$		
$=\frac{10}{9}$		
Rs. 2.22		
Question 32		
The height of 30 boys of a class are give	en in the following table:	
Height in cm	Frequency	

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120-129	2
130-139	8
140-149	10
150-159	7
160-169	3

If by joining of a boy of height 140 cm, the median of the heights is changed from M_1 to M_2 then M_1 - M_2 in cm is

(b) -0.1

(d) 0.2

(a) 0.1 (c) 0

Answer: C Explanation:

Explanation.			
Height in cms	Frequency	Cumulative frequency	Actual Class limit
120-129	2	2	119.5-129.5
130-139	8	10	129.5-139.5
140-149	10	20	139.5-149.5
150-159	7	27	149.5-159.5
160-169	3	30	159.5-169.5
n = 30			

Here n = 30

$$\therefore \frac{n}{2} + 1 = 15 + 1 = 16$$

 \therefore 16 is under cumulative frequency 20. So median class be 140-149 L1 = 139.5, L2 = 149.5, f = 10, n = 30, c = 10.

- Median M₁ = L₁+ $\frac{L_2-L_1}{f} \left(\frac{n}{2} c \right)$
- $= 139.5 + \frac{10}{10} (15 10)$

$$= 139.5 + \frac{10}{10} \times 5 = 144.5$$

If by joining f a boy of height 140 cms, the n=31, f=11

: Median M₂ = 139.5 + $\frac{149.5 - 139.5}{11}$ (15.5 - 10)

 $= 139.5 + \frac{10}{11} \times 5.5 = 144.5$ cms

Then $M_1 - M_2 = 144.5 - 144.5 = 0$

Question 33

The marks awarded to seven students in a school admission test were:

	Mathematics	English
А	55	35
В	45	32
С	75	44
D	15	50
Е	10	45
F	40	60
G	06	40

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Which subject has the better median value?

(a) Mathematics

(c) Both (a) and (b) above

(b) English

(d) None of the above

Answer: B

Explanation:

The awarded makes in Mathematics and English were arranged in ascending in ascending order separately.

Maths	English
06	32
10	35
15	40
40	44
45	45
55	50
75	60

Hence, English has the better median value.

Question 34

Identify the mode of the given distribution.

Marks	4	5	6	7	8
Number of	3	5	10	6	1
students					

(a) 7 (b) 1 (c) 8 (d) 6 Answer: D Explanation:

Mode is 6 as it has the highest frequency

Question 35

The given data are the times (in minutes), it takes seven students to go to school from their homes.

11	6	22	7	10	6	15	
Which statement about the data is false?							
(a) Their median is 11. (b) Their mean is 15.							
(c) Their ra	nge is 16			(d) Their mod	e is 6.		
Answer: a							
Explanatio	n:						
Arranging the given data in ascending order, we get 6, 6, 7, 10, 11, 15, 22							
Mean = $\frac{6+6+7+10+11+15+22}{2}$							
$\frac{77}{7} = 11$							
$\frac{1}{7} = 11$							
$Mode = 6 Median = 4^{th} value = 10$							
Owentier 2	_						

Question 36

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The medians of the following two sets of numbers are equal, and the sets are arranged in ascending order $\{1, 4, x, 8\}$ and $\{2, 5, y, 9\}$. What is y - x?

(a) -1	(b) 0
(c) -2	(d) 3
Answer: a	

Explanation:

Recall that the median of an even-numbered of numbers is the arithmetic mean of the pair of middle terms. Thus $\frac{(4+x)}{2}$ = median of the first set and $\frac{(5+y)}{2}$ -= median of the second set. Since both median are equal, we can set the equations equal to each other. $\frac{(4+x)}{2} = \frac{(5+y)}{2}$. Multiply both sides by 2 and we get 4 + x =5 + y. we also know that 4 < x < 8 and 5 < y < 9, since the sets are arranged in ascending order. This narrows our options for x and y down significantly. Plugging in various values will eventually get you to x = 7 and y = 6, since 7 + 4 = 11 and 5 + 6 =11, and thus the median in both cases would be 5.5. thus, y-x = -1

Question 37

What is the median in the following set of numbers 16, 19, 16, 7, 2, 20, 9, 5. (a) 2 (b) 16 (c) 4.5 (d) 12.5 Answer: d

Explanation:

16, 19, 16, 7, 2, 20, 9, 5 Order the numbers from smallest to largest. 2, 5, 7, 9, 16, 19, 20 The median is the number in the middle. In this case, there is a 9 and 16 in the middle. When that happens, take the average of the two numbers.

Question 38

Find the medi	ian: 4,4,4,4,6,'	7,9,9,1 2	2,12,	12,12	, 12,12,12 ,	,18,76,90.
(a)11.9					(b) 9	
(c) 76					(d) 12	
Answer: d						
Explanation :						
	A			0		

To find the median, arrange the numbers from smallest to largest: 4,4,4,4,6,7,9,9,12,12,12,12,12,18,76,90

There are 17 numbers in total. Since 17 is an odd number, the median will be the middle number of the set. In this case, it is the 9th number, which is 12.

Question 39

There are 3,500	people in	group A and	l 5,000 peo	ple in grou	p B:
-----------------	-----------	-------------	-------------	-------------	-------------

There are block people in group it and block people in group Di				
Car type	% in group A who own	% in group B who own		
Motorbike	4	9		
Sedan	35	25		
Minivan	22	15		
Van	9	12		
Coupe	3	6		

What is the median of the number of people in group B who own either a minivan.Van or coupe?

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mentioned. If we do each 0.06(5000), 0.12(that the median, or middle value, would ha	question asks for EITHER of 3 categories, so we can
76, 82, 45, and 65 respectively. What wa (a) 73 (c) 70 Answer: b	ts are 50, 70, 87, 95, 100, 34, 56, 76, 43, 88, 92, as the medians score for this test? (b) 76 (d) 89
median is defined as the number that is in a largest. Therefore, we must first sort the nu 34,43,45,50,56,65,70,76,76,87,88,92,95,100 43,45,50,56,65,70,76,81,87,88,92,95 45,50,56,65,70,76,76,87,88,92 50, 56, 65, 70, 76,76,87,88 56, 65, 70,76,76,87 65, 70, 76, 76 70, 76, 76 76	
<u>Question 41</u> Set A = [-10, 4, 2,-14,-2] Quantity A: The mean of Set A Quantity B: The median of set A	
(a) Quantity B is greater.(c) The relationship cannot be determined	(b) Quantity A is greater. (d) The two quantities are equal.
 Answer: a Explanation: Begin by reordering the set in numerical or Set A = [-10, 4, 2, -14, -2] Then becomes Set A = [-14, -10, -2, 2, 4] Since there are an odd number of values, the Quantity B: -2 Now, to find the arithmetic mean, take the set 	

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 $\frac{-14 - 10 - 2 + 2 + 4}{5}$ **Ouantity A: -4 Ouestion** 42 The arithmetic mean of 2-x,3x2,7-15x,x2-8x+23 is -1 **Quantity A: 3** Quantity B: The median of 2, x, 1, 4, 10, 8,, 2, x, 1, 4, 10, 8 (b) Quantity A is greater (a) Quantity B is greater. (c) The relationship cannot be (d) The two quantities are equal. determined Answer: a **Explanation**: X is an unknown value, but it can be found given what we know about the mean of the set 2x,3x2,7-15x,x2-8x+23: $\frac{(2-x) + (3x^2) + (7-15x) + (x^2 - 8x + 23)}{4} = -1$ $4x^2 - 24x + 32 = -4$ $x^2 - 6x + 8 = -1$ $x^2 - 6x + 9 = 0$ (X-3)(X-3)=0X=3 Now, Quantity B: is out of order; arrange in numerically: 1, 2, x=3, 4, 8, 10 Since, there is even number of values; the median is the mean of the two middle most values: Quantity B: $\frac{3+4}{2} = 3.5$ 3+42=3.5

Question 43

Bill runs for 30 minutes at 8 mph and then runs for 15 minutes at 13 mph. what was his average speed during his entire run? (b) $9\frac{2}{3}$ mph (d) $10\frac{1}{2}$ mph

(a) 10 mph

(c) 11 mph

Answer: b

Explanation:

Rate = distance/time.

Find the distance for each individual segment of the run (4 miles and 3.25 miles.). Then add total distance and divide by total time to get the average rate, while making sure the units are compatible (miles per hour not mils per minute), which means the total 45 minute run time needs to be converted to 0.75 of an hour; therefore (4 miles + 3.25 miles/0.75 hour) is the final answer.

Ouestion 44

Find the mode for the following data.

Age	0-6	6-12	12-18	18-24	24-30	30-36	36-42
Frequency	6	11	25	35	18	12	6

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(a) 20.22	(b) 19.47
(c) 21.12	(d) 20.14
Answer: a	
Explanation:	
Since, maximum class frequency is	35, so the mode class is 18-24.
Now, Mode = L + $\frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times h$	
$18 + \left(\frac{35 - 25}{2 \times 35 - 25 - 18}\right) \times 6$	
= 18+2.22 = 20.22	

Question 45

Find the median for the following distribution of workers.

Daily wages	No. of workers	Daily wages	No. of workers
1-3	6	9-11	21
3-5	53	11-13	16
5-7	85	13-15	4
7-9	86	15-17	4

(a) 7.14	(b) 6.84
(c) 5.92	(d) 5.57
Answer: b	

Explanation:

Daily wages	No. of workers	Cumulative frequency (cf)
1-3	6	6
3-5	53	59
5-7	85	144
7-9	86	230
9-11	21	251
11-13	16	267
13-15	4	271
15-17	4	275

Here, n = 275

$$\frac{n}{2}$$
 = 137.5
Median class 5-7
Median = l + $\left(\frac{\frac{n}{2}c.f.}{f}\right)$ × h
= 5 + $\left(\frac{137.5-59}{85}\right)$ × 2 = 5 + $\frac{78.5}{85}$ × 2

= 6.84

= 5 + 1.84

Question 46

In an examination of 675 candidates of maximum marks 100 the examiner supplied the following information.

Marks obtained	No. of candidates
Less than 10%	7
Less than 20%	39

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Less than 30%		95	
Less than 40%		201	
Less than 50%		381	
Less than 60%		545	
Less than 70%		631	
Less than 80%		675	
Calculated median and mode	respectively of the perce	entage marks obtained.	
(a) 47, 58, 46, 33	(b) 49, 12,	48, 22	
(c) 45, 24, 46, 22	(d) 47.58,	48.22	
Answer: d			
Explanation:			
Marks (fi)	cf	Frequency	
0-10	7	7	
10-20	39	32	
20-30	95	56	
30-40	201	106	
40-50	381	180	
50-60	545	164	
60-70	631	86	
70-80	675	44	
Here $n = 675$			

Here, n = 675

$$\frac{n}{2}$$
 = 337.5
So, median class 40-50
Median = l + $\left(\frac{\frac{n}{2}-c.f.}{f}\right)$ × h
40 + 7.58 = 47.58
Now, maximum frequency is 180
So modal class is 40-50
Modes = l + $\left(\frac{f_1-f_0}{2f_1-f_0-f_2}\right)$ × h
40 + $\left(\frac{180-106}{2\times180-106-164}\right)$ × 10
40 + $\frac{74}{90}$ × 10 = 40 + 8.22 = 48.22

Question 47

Find the mean, median and mode of the following data.

Classes	0-20	20-40	40-60	60-80	80-100	100-120	120- 140
Frequency	6	8	10	12	6	5	3
(a) 88				(b) 60			
(c) 65	(d) 100						
Answer: C							
Explanation	1:						
Class	(xi)		Freque	ncy	xifi	Cumulat	ive
			(fi)			frequent	cy (cf)
0-20	10		6		60	6	
20-40	30		8		240	14	

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40-60	50	10	500	24
60-80	70	12	840	36
80-100	90	6	540	42
100-120	110	5	550	47
120-140	130	3	390	50
Total		Σfi = 50	Σfixi = 3120	

Mean = $\frac{\Sigma fixi}{\Sigma fi}$

 $=\frac{3120}{50} = 62.4$ n = 50, $\frac{n}{2} = 25$ Median class is 60-80

Median = $l + \frac{\left(\frac{n}{2} - c.f.\right)}{f} \times h$ = $60 + \left(\frac{25 - 24}{12}\right) \times 20$ = 60 + 1.67Maximum frequency is 12, so modal class is 60-80 Mode = $l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times h$ $60 + \left(\frac{12 - 10}{2 \times 12 - 10 - 6}\right) \times 20$

60+5 = 65

Question 48

 The mean of 1, 3, 4, 5, 7, 4 is m. The numbers 3,2,2,4,3,3, p have mean m⁻¹ and median q.

 Then, p + q=

 (a) 4
 (b) 5

 (c) 6
 (d) 7

 Answer: d

 Explanation:

Mean of 1, 3, 4, 5, 7 and 4 is m. → $\frac{1+3+4+5+7+4}{6} = m$ M = 4 Now, mean of 3, 2, 2, 4, 3, 3 and p is m⁻¹ $\frac{3+2+2+4+3+3+p}{6} = 3$ (\therefore m = 4) → 17+p = 21 → p = 4 Arranging 3, 2, 2,4,3,3 and 4 in ascending order, we get 2,2,3,3,3,4,4 \therefore Median (q) = n $\left(\frac{7+1}{2}\right)^m$ term - 4th term = 3 \therefore p + q = 4 + 3 = 7

Question 49

The mean of six numbers is 21. If one number is excluded, then their mean is 19, the excluded number is ____.
(a) 31 (b) 26

(d) 51	(D) 20
(c) 28	(d) 25
Answer: a	
Explanation:	

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Let the excluded number be x and the sum of rest of numbers be y. then, $21 = \frac{x+y}{6}$

→ 126 = x + y $19 = \frac{y}{5}$ → y = 95 \therefore From (i) x = 31

Question 50

If 7, 2, 9, and 5 occur with frequencies 2, 3, 6 and 4 respectively, then the arithmetic mean is -____.

(a) 6.25	(b) 6.75
(c) 6.27	(d) 6.42
Answer: c	
Explanation:	
Arithmetic mean = $\frac{x1f1+x2f2+\dots+xnfn}{f1+f2+\dots+fn}$	

 $\frac{f_{1+f_{2}+\dots+f_{n}}}{(7\times2)+(2\times3)+(9\times6)+(5\times4)}$

2+3+6+4

 $\frac{14+6+54+20}{15} = \frac{94}{15} = 6.27$

Question 51

Find n such that $\frac{a^{n+1}+b^{n+1}}{a^{n}+b^{n}}$ may be the geometric mean between a and b:

(b) 1

(d) 0

(a) $\frac{1}{2}$ (c) $\frac{-1}{2}$

Answer: c Explanation:

We know that geometric mean between a & b is a & b = \sqrt{ab} It is given that

G.M. between a & b = $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ $\sqrt{ab} = \frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ $ab^{\frac{1}{2}} = \frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ $(ab)^{\frac{1}{2}(a^n+b^n)=a^{n+1}}+b^{n+1}$ $a^{\frac{1}{2}}b^{\frac{1}{2}}(a^n+b^n)=a^{n+1}+b^{n+1}$ $\frac{1}{a^2}+n=\frac{b^n+\frac{1}{2}[\frac{1}{b^2}-\frac{1}{a^2}]}{\frac{1}{b^2}-\frac{1}{a^2}}$ $\frac{1}{a^2}+n=1$ $\left(\frac{a}{b}\right)^{\frac{1}{2}+n}=\left(\frac{a}{b}\right)^0$ Comparing power $\frac{1}{2}+n=0$ $n=-\frac{1}{2}$

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Question 52 What is the mode of 10, 2, 8, 6, 7, 8, 9, 10, 10, 11 and 10? (a) 10 (b) 12 (d) 8 (c) 14 Answer: a **Explanation**: Mode = observation with the highest frequency = 10

Ouestion 52

The mean of the marks in statistics of 100 students in class x was 72. The mean of marks for boys was 75, while their number was 70. What is the mean of marks of girls in the class?

(a) 35	(b) 65
(c) 68	(d) 86
Answer: b	(4) 00
Explanation: Total marks of boys	
$\frac{\text{Total number of girls}}{100 \times 72 - 75 \times 70} = \frac{7200 - 5250}{30}$	
$\frac{30}{1950} = 65$ $30 = 30$ $30 = 30$	
Question 53	
Which of the following is true about the	mode of a given data?
(a) It may or may not exist for a Given data.	(b) It is always unique.
(c) It is very difficult to compute Mode.	(d) We cannot calculate n The empirical formula
Answer: a	_
Explanation:	
Mode of a given data may or may not exist	sometimes.
Range = $22 - 6 = 16$	
Question 54	
The A.M. of 12 observations is 15. If an o	bservation 20 is removed,
mean of the remaining observations?	
(a) 14.5	(b) 13
(c) 15	(d) 13.5
Answer: a	
Explanation:	
he A.M. of 12 observations is 15.	
Sum of 12 observations = $12 \times 15 = 180$	
An observation 20 is removed	
Mean of the remaining observations	

M

 $=\frac{180-}{(12-}$

Question 55 If for a given data median is 125.6 and mean is 128, find mode. For more Info Visit - www.KITest.in

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14.24

mode without a.

what is the arithmetic

M. of 12 observations is 15.
um of 12 observations = 12×15 = 180
bservation 20 is removed
ean of the remaining observations
$\frac{-20}{-1} = \frac{160}{11} = 14.5$
-1) 11 -11

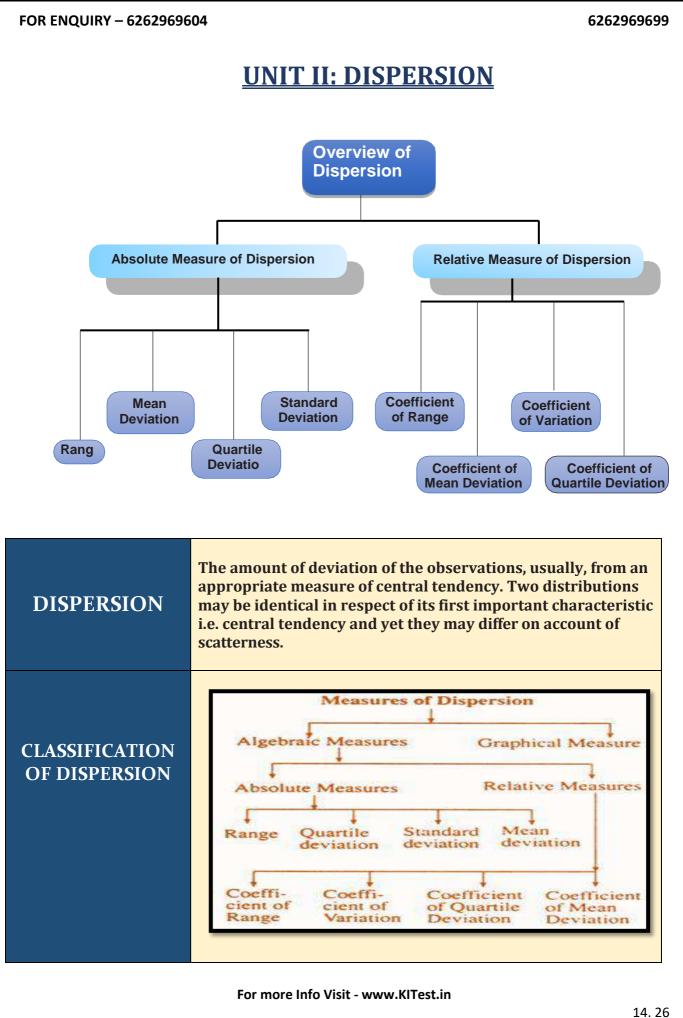
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(a) 120.8 (b) 128.0(c) 108.2 (d) 180.2**Answer: a Explanation:** Given median = 125.6 and mean = 128. Mode = 3 Median - 2 Mean = $(3 \times 125.6) \cdot (2 \times 128)$ = 376.8 - 256= 120.8

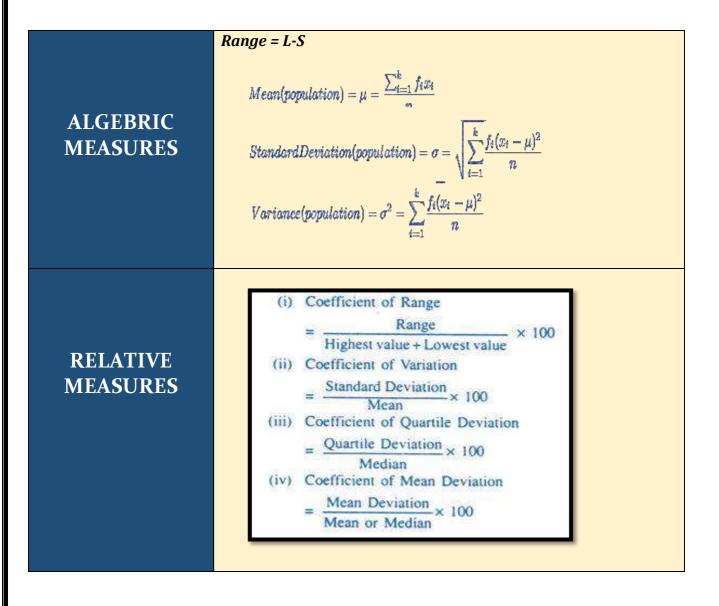
Question 56 What is the arithmetic mean of a+2, a and a-2? (a) a+2 (b) a (c) a-2 (d) 3a Answer: b Explanation: $Mean = \frac{a+2+a+a-2}{3} = \frac{3a}{3} = a$

<u>Question</u> 57				
Which of the following is not a measure of central tendency?				
(a) Mean	(b) Median			
(c) Mode	(d) Standard deviation			
Answer: d				
Explanation:				
Mean, median and mode are the meas	ures of central tendency.			

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Question 1

Following are the wages of 8 workers expressed in rupees: 82, 96, 52, 75, 70, 65, 50, 70. Find the range and also its coefficient.

(a) 46,31.51 (c) 56, 76

(b) 64,32 (d) 90,33

Answer: a **Explanation**:

The largest and the smallest wages are L = Rs. 96 and S = Rs. 50 Thus range = Rs. 96 – Rs. 50 = Rs.46

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Coefficient of range = $\frac{96-50}{96+50} \times 100$ = 31.51

Ouestion 2

What is the coefficient of range for the following distribution of weights?

Weights in	50-54	55-59	60-64	65-69	70-74
kgs:					
No. of	12	18	23	10	3
students					

(n)	20
la	20

(c) 20.16

(b) 21 (d) 40.34

Answer: c

Explanation:

The lowest class boundary is 49.50 kgs. And the highest class boundary is 74.50 kgs. Thus we have

Range = 74.50 kgs, - 49.50 kgs.

=25 kgs.

Coefficient of range = $\frac{74.50-49.50}{74.50+49.50} \times 100$

$$=\frac{25}{124} \times 100$$

= 20.16

Question 3

Anubhav scored 85, 91, 88, 78, 85 for a series of exams. Calculate the mean deviation for his test scores?

(b) 5.78

(d) None

(a) 3.28 (c) 6.89

Answer: a

Explanation:

Given test score; 85, 91, 88, 78, 85

Mean =
$$\frac{(85+91+88+78+85)}{5}$$
 = 85.4

9	Subtracting mean from each score:					
х	Xi - X	$ x_i - x $				
85	-0.4	0.4				
91	5.6	5.6				
88	2.6	2.6				
78	-7.4	7.4				

-0.4

85 Mean deviations = $\frac{16.4}{5}$ = 3.28

Ouestion 4

The wheat production (in kg) of 220 acres is given as: 1120, 1240, 1320, 1040, 1080, 1200, 1440, 1360, 1680, 1730, 1785, 1342, 1960, 1880, 1755, 1720, 1600, 1470, 1750, and 1885. Find the quartile deviation

(a)	246.875
(c)	246.89

(b) 246 (d) 175

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0.4

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Answer: a Explanation:

After arranging the observations in ascending order, we get 1040, 1080, 1120, 1200, 1240, 1320, 1342, 1360, 1440, 1470, 1600, 1680, 1720, 1730, 1750, 1755, 1785, 1880, 1885, 1960. Q1 = Value of $\left(\frac{n+1}{4}\right)$ th item = Value of $\left(\frac{20+1}{4}\right)$ th = Value of (5.25)th item = 5th item + 0.25(6th item - 5th item) = 1240+0.25(1320-1240) Q1 = 1240 + 20 = 1260 Q3 = value of $3\left(\frac{n+1}{4}\right)$ th item = value of $3\left(\frac{20+1}{4}\right)$ th item = value of $3\left(\frac{20+1}{4}\right)$ th item = 15th item + 0.75(16th item - 15th item) = 1750 Q3=1750+3.75=1753.75 Q. D. $= \frac{Q_3-Q_1}{2} = \frac{1753.75-1260}{2} = \frac{492.75}{2}$ = 246.875

Question 5

Compute coefficient of variation from the following data:

Age :	under	under	under	under	under	under
	10	20	30	40	50	60
No. of persons dying:	10	18	30	45	60	80

(b) 89.88

(d) None

(a) 48.83

(c) 756.34

Answer: a

Explanation:

Age in years class interval	No. of persons dying (f _i)	Mid value (x _i)	di = xi - 25 10	fidi	fidi ²
0-10	10	5	-2	-20	40
10-20	18-10=8	15	-1	-8	8
20-30	30-18=12	25	0	0	0
30-40	45-30=15	35	1	15	15
40-50	60-45=15	45	2	30	60
50-60	80-60=20	55	3	60	180
Total	80	-	-	77	303

 $CV = \frac{s}{v} \times 100$

The AM is given by:

$$\overline{\mathbf{x}} = \mathbf{A} + \frac{2f_i a_i}{N} \times \mathbf{C}$$
$$= 25 \left(\frac{77 \times 10}{N}\right) \text{ years}$$

$$= 34.63$$
 years

The standard deviation is

 $\sqrt{\frac{\Sigma f_i d_i}{N} - \left[\frac{\Sigma f_i d}{N}\right]^2} \times C$

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 $\sqrt{\frac{303}{80} - \left[\frac{77}{80}\right]^2 \times 10 years} \\ \sqrt{3.79 - 0.93 \times 10} year \\ = 16.91 years \\ \text{Thus the coefficient of variation is given by} \\ = \frac{16.91}{34.63} \times 100 \\ = 48.83$

Question 6

What is the mean deviation about mean for the following numbers? 5, 8, 10, 10, 12, 9.(a) 1.74(b) 1.67(c) 1.87(d) 1.47Answer: bExplanation:The mean is given by $\overline{X} = \frac{5+8+10+10+12+9}{6}$

= 9

Computation of MD about AM

X7	X7 X7
Xi	Xi - X
5	4
8	1
10	1
10	1
12	3
9	0
Total	10

Thus mean deviation about mean is given by

$$X_i - X = \frac{2^{10}}{6} = 1.67$$

Question 7

From the above data calculate coefficient of mean deviation(a) 12.45(b) 123(c) 989(d) None

Answer: a

Explanation:

Coefficient of mean deviation = $\frac{MD \ about \ Median}{Median} \times 100$ = 12.4

Question 8

For a group of 60 boy5 students, the mean and SD of stats. Marks are 45 and 2respectively. The same figures for a group of 40 girl students are 55 and 3 respectively.What is the SD of marks if the two groups are pooled together?(a) 5.44(b) 5.48(c) 49(d) 3

Answer: c

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Explanation:

 $\mathbf{X} = \frac{n_1 x_1 + n_2 x_2}{n_1 + n_2}$

 $\frac{60 \times 45 + 40 \times 55}{60 + 40} = 49$

Question 9

From the above questions and expression find standard deviation of marks (a) 5.44 (b) 5.48 (c) 30 (d) 3 Answer: b Explanation: $d_1 = X_1 - X = 45 - 49 = -4$ $S = \sqrt{\frac{n_1 s_1^2 + n_2 s_2^2 + n_1 d_1^2 + n_2 d_2^2}{n_1 + n_2}}$ $d_1 = X_1 - X = 55 - 49 = 6$ $\frac{\sqrt{60 \times 2^2 + 40 \times 3^2 + 60 \times (-4)^2 + 40 + 6^2}}{60 + 40}$

 $\sqrt{30} = 5.48$

Question10

Calculate the mean deviation about median for the following data

Class	0-10	10-20	20-30	30-40	40-50	50-60	
Frequency	6	7	15	$\frac{1}{6}$	4	2	
(a) 10.16 (b) 30.69 (c) 28 (d) 30 Answer: a Explanation:							
Class		Frequency		Cumulative frequency		Mid – point _{Xi}	
0-10		6		6		5	
10-20		7		7 +6 = 13		15	
20-30		15	1	13 + 15 = 28		25	
30-40		16	2	28 + 16 = 44		35	
40-50		4	4	44 + 4 = 48		45	
50-60		2	4	48 + 2 = 50	55		
		50					

$$N \Sigma f_i = 50$$

Median Class
$$\left(\frac{N}{2}\right)^{th}$$
 term

$$\left(\frac{50}{2}\right)^{th}$$
term 25th

In above data cumulative frequency of class 20-30 is 28 which is slightly greater than 25. \therefore Median class = 20 - 30

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Median = $1 + \frac{N}{2} - c}{f} \times h$ Where, L = Lower limits of median class N = Sum of frequencies F = frequency of median class C = Cumulative frequency of class before median class Here, l = 20, N = 50, C = 13, h = 10, f = 15 Median = $1 + \frac{N}{2} - c}{f} \times h$ $20 + \frac{\frac{50}{2} - 13}{15} \times 10$ $20 + \frac{12}{15} \times 10$ 20 + 8 = 28

Finding mean deviations about Median = $\frac{\Sigma f_{i|X_I - M|}}{\Sigma f_i}$

<u> </u>		
ss F	$-M$ $f_i x_i - M$	[]
0 6	8 =23 6 × 23 = 13	38
20 7	28 =13 7 × 13 = 91	L
30 1	28 =3 15 × 3 = 45	5
40 1	28 =7 16 × 7 = 11	12
50 4	28 =17 4 × 17 = 68	3
60 2	28 =27 2 × 27 = 54	1
Σ	- <i>M</i> 508	

 $\sum f_i = 50 \& |x_i - M| = 508$ $\therefore \text{Mean deviation (M)} = \frac{\sum f_i |x_i - M|}{\sum f_i}$ $\frac{508}{50} = 10.16$

Question 11

5 students obtained following marks in statistics: 20, 35, 25, 30, 15 find out range and coefficient of range. (a) 20, 0.4 (b) 20, 0.5

(c) 30, 10 (d) 30, 5 Answer: a Explanation: Here, Highest value (H) = 35 Lowest value (L) = 15 Range = Highest value –Lowest value i.e. R = H-L Substituting the given values in the formula R = 35 – 15 = 20 Coefficient of range is as follows: $CR = \frac{H-L}{H+L}$ Or, $CR = \frac{35-15}{35+15}$

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 $=\frac{20}{50}$

CR = 0.4

Hence, the range (R) of the above data is 20 and coefficient of Range (CR) is 0.4

Ouestion 12

Prices of shares of a company were not as under from Monday through Saturday. Find out range and the coefficient of range.

Day	Mon.	Tues.	Wed.	Thu.	Fri	Sat.
Price	200	210	208	160	220	250

(a) 20, 0.4 (b) 90, 0.22 (c) 30, 0.65 (d) 30, 5.69 **Answer: b Explanation**: Here, Highest value among the prices of shares = 250 Lowest value among the prices of shares = 160Range (R) = Highest value (H) – Lowest value (L) or, R = 250-160R = 90Coefficient of Range 9CR) = $\frac{H-L}{H+L}$ Or, CR = $\frac{250-160}{250+160}$ $=\frac{90}{410}$ CR = 0.219 or 0.22 (Approx.)

Question13

You know share market is going bullish during the last several months. Collect weekly data on the share price of any two important industries during the past six months. Calculate the range of share prices. Comment on how volatile is the share prices.

(a) Tata motors shares are more volatile as compared to the prices of Reliance shares.

- (c) Tata motors shares are equal as a
- (b) Tata motors shares are less volatile as compared to the prices of Reliance

shares. (d) None of these

To the prices of Reliance shares.

Answer: b

Explanation:

Month	Price of shares Tata Motors	Price of shares Reliance
Oct.	325	913.35
Nov.	397	900.25
Dec.	405	750.90
Jan.	415	780.70
Feb.	420	799.25
Mar.	388	850.35

For TATA Motors Highest Value = 420 Lowest Value = 325 Range (R) = Highest Value (H) – Lowest Value (L) or, $R_1 = 420-325$ $R_1 = 95$

Coefficient of Range (CR) = $\frac{H-L}{H+L}$

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Or, $Cr = \frac{420-325}{420+325}$ = $\frac{95}{745} = 0.127$ For Reliance Highest Value = 913.35 Lowest value = 750.90 Range (R) = Highest Value (H) – lowest Value (L) or, R₂ = 913.25 – 750.90 R₂ = 162.45 Coefficient of Range (CR) = $\frac{H-L}{H+L}$ $CR = \frac{913.35-750.90}{913.35+750.90}$ = $\frac{162.45}{1664.25} = 0.097$

From the above results we can observe that the price of the Tata Motors shares is less volatile as compared to the prices of Reliance shares.

Question14

Calculate range and the coefficient of range of the following series:

Calculate range a	and the co	Demcient	of range	of the follow	wing ser	les:	
Marks	10	20	30	40	50	60	70
No. of students	15	18	25	30	16	10	9
(a) 20,0.4				(b) 20,0.5			
(c) 60,0.75				(d) 30,5			
Answer: c							
Explanation :							
Here,							
Highest value = 7	0						
Lowest value = 10)						
Range (R) = Highe	est value (H) – Lowe	est Value (L)			
= 70	0 - 10						
= 6							
Coefficient of Ran	ge (CR) =	$\frac{H-L}{H+L}$					
$CR = \frac{70 - 10}{70 + 10} = \frac{60}{80} = 0$		H+L					
					-		
Hence, the Range	(R) of the	above ser	ies is 60 a	and coefficies	nt of Ran	ge (CR) is 0.	75
Question15							

Find the variance of the following data: 6, 8, 10, 12, 14, 16, 18, 20, 22, 24. (a) 33 (b) 15 (c) 10 (d) 14 Answer: a Explanation:

Xi	$d_i = \frac{x_i - 14}{2}$	<i>x</i> _i - x	$(x_i - x)^2$
6	$\frac{6-14}{2} = -4$	6 - 15 = -9	$(-9)^2 = 81$
8	$\frac{8-14}{2} = 3$	8 - 15 = -7	$(-7)^2 = 49$

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10	$\frac{10-14}{2} = -2$	10 -15 = -5	$(5)^2 = 25$
12	$\frac{12-14}{2} = -1$	12 -15 = -3	$(-3)^2 = 9$
14	$\frac{14-14}{2} = 0$	14 - 15 = -1	$(-1)^2 = 1$
16	$\frac{16-14}{2} = 1$	16 - 15 = 1	$(1)^2 = 1$
18	$\frac{18-14}{2} = 2$	18 - 15 = 3	$(3)^2 = 9$
20	$\frac{20-14}{2} = 3$	20 - 15 = 5	$(5)^2 = 25$
22	$\frac{22-14}{2} = 4$	22 – 15 = 7	$(7)^2 = 49$
24	$\frac{24-14}{2} = 5$	24 - 15 = 9	$(9)^2 = 81$
	$\sum \frac{1^0}{1} d_i = 5$		$\sum \frac{1^0}{1} (x_i - x)^2 = 330$

Mean \overline{X} = assumed mean $\frac{\sum_{i=1}^{10}}{n} \times h$ Where a = assumed mean = 14 $d_i = \frac{x_i - a}{h}$ h = class width = 8-6 = 2 n = number of observation = 10 Mean $\overline{X} = 14 + \frac{5}{10} \times 2 = 15$ Variance $(O'^2) = \frac{1}{n} \Sigma (x_i - \overline{X})^2$ $\frac{1}{10} \times 330$ 33

Question16

Find the standard deviation of the following data:

Class	30-40	40-50	50-60	60-70	70-80	80-90	90- 100
Frequency	3	7	12	15	8	3	2

(a) 14 (c) 62 Answer: d Explanation:	(b) 50 (d) 14.17	

Class	Frequency	Mid – point	$f_i x_i$
	(f_i)	(x_i)	
30-40	3	35	35 × 3 = 105
40-50	7	45	45 × 7 = 315
50-60	12	55	55 × 12 = 660
60-70	15	65	65 × 15 = 975
70-80	8	75	75 × 8 = 600

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80-90	3	85	85 × 3 = 255
90-100	2	95	95 × 2 = 190
	$\sum f_i = 50$		$\sum f_i x_i = 3100$

 $\sum_{i=1}^{n} f_i x_i = 3100$ $\sum_{i=1}^{n} f_i = 50$ Mean $\overline{X} = \frac{\sum f_I x_i}{\sum f_i}$ $\frac{3100}{50} = 62$ Variance $(O'^2) = \frac{1}{n} \sum (x_i - \overline{X})^2$ $\frac{1}{50} \times 10050 = 201$ Standard deviation $(O') = \sqrt{201}$ (O') = 14.17

Questioin17

Estimate coefficient of quartile deviation of the following data:

Sr. No.	1	2	3	4	5	6	7	8	9	10	11	
Data	8	9	11	12	13	17	20	21	23	25	27	

(a) 3.53	(b) 0.353
(c) 0.689	(d) 0.591

Answer: b

Explanation:

In order to find the quartile deviation in case of individual series, we need to find out the values of third quartile and first quartile using the following equations:

Q₁ = size of
$$\left(\frac{N+1}{4}\right)^{th}$$
 item
Q₁ = size of $\left(\frac{11+1}{4}\right)^{th}$ item
Q₁ = size of 3th term
Q₁ = 11
Q₁ = size of $3\left(\frac{N+1}{4}\right)^{th}$ item
Q₁ = size of $3\left(\frac{11+1}{4}\right)^{th}$ item
Q₁ = size of $3\left(\frac{11+1}{4}\right)^{th}$ item
Or, Q₃ = size of 9th term
Or, Q₃ = 23
Calculating Quartile Deviation and Coefficient of Quartile Deviation:
Quartile Deviation (Q.D.) $\frac{Q_3-Q_1}{2}$
Q.D. $\frac{23-11}{2}$
Q.D. $\frac{12}{2}$
Q.D. = 6
Coefficient of Quartile Deviation (Q.D.) $\frac{Q_3-Q_1}{Q_3+Q_2} = \frac{23-11}{23+11} = \frac{12}{34} = 0.353$

Question18

A measure of relative dispersion is given by the:

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(a) Co-efficient of variance

(c) Quartile deviation

Answer: a

Explanation:

(b) Standard deviation(d) Variance

Co-efficient of variance: This term is used commonly to mean scatter, deviation, Fluctuation, Spread or variability of data. Relative Measures of Dispersion Relative measures of dispersion are also known as coefficient of dispersion are obtained as ratios or percentages.

Question19

The _____ is the easiest measure of dispersion to calculate.

Symbol	Symbol Name	Meaning / definitions
Var (X)	variance	variance of random variable X
0 ²	variance	variance of population values
std (X)	standard deviation	standard deviation of random variable X
O' _x	standard deviation	standard deviation value of random variable X

(b) Range

(d) Variance

(a) Standard Deviation

(c) Mean absolute deviation

Answer: b

Explanation:

Range is basically the difference between the lowest and highest values.

Question20

Which of the following symbols represents the standard deviation of the population? (a) O^2 (b) μ (c) O (d) \overline{X} Answer: c Explanation: O'Question21 The variance can never be

(a) Larger than the standard deviation(c) Smaller than the standard deviation

(b) Negative (d) Zero

Answer: b Explanation:

Sometimes (negative or positive number) squared is always a positive number, except zero squared which is still zero. Because the squared deviations are all positive numbers or zeroes, their smallest possible mean is zero. It can't be negative. This average of the squared deviations is in fact variance. Hence the variance can be negative.

Question22

The numerical value of the standard deviation can never be

(a) Negative(c) ZeroAnswer: aExplanation:

(b) Larger than the variance (d) None

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Standard deviation formula is computed using squares of the numbers. Square of a number cannot be negative. Hence standard deviation cannot be negative. Here (x-mean) is squared, so, this cannot be negative. N, number of terms cannot be negative, hence SD cannot be negative.

Question23

The description measure of dispersion that is based on the concept of a deviation about the mean is

(a) The absolute value of the range (c) Standard deviation

(b) Range

(d) Inter quartile range

Answer: c

Explanation:

A measure of dispersion is a numerical value describing the amount of variability present in a data set. The standard deviation (SD) is the most commonly used measures of dispersion. With the SD you can measure dispersion relative to the scatter of the values about their mean.

Question24

When should measures of location and dispersion be computed from grouped data rather than from individual data values?

- (a) Whenever computer packages for descriptive statistics are unavailable
- (c) Only when the data are from a population
- (b) As much as possible since computations are easier
- (d) Only when individual data values are unavailable

Answer: d

Explanation:

Only when individual data values are unavailable should measures of location and dispersion be computed from grouped data rather than from individual data values.

Question25

Which information is false regarding Lorenz curve

- (a) The Lorenz curve devised by Dr. Max O. is a graphic method of studying Dispersion.
- (c) The Lorenz curve always lies below the line of equal distribution, unless the distribution is uniform
- (b) Used this technique to show employment of a group of people
- (d) The area between the line of equal distribution and the plotted curve gives the extent of inequality in the items. The larger the area, more is the inequality

Answer: b

Explanation:

A graph on which the cumulative percentage of total national income (or some other variable) is plotted against the cumulative percentage of the corresponding population (ranked in increasing size of share). The extent to which the curve saqs below a straight diagonal line indicates the degree of inequality of distribution.

Question25

Adding a constant to each value in a data set does not change the distance between values so the standard deviations remains

(a) Constant(c) Vary with multiple of primeAnswer: a

(b) Vary(d) None of these

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Explanation:

For example, consider the following numbers 2.3.4.4.5.6.8.10 for this set odd data standard deviation would be

$$8 = \sqrt{\frac{\sum_{i=1}^{n} (x_i - x)^2}{n - 1}}$$
$$8 = \sqrt{\frac{(2 - 5.25)^2 + (3 - 5.25)^2 + \dots + (10 - 5.25)^2}{8 - 1}}$$

If we were to add 5 to each value in this data set. The new set of values would be 7, 8, 9, 9, 10, 11, 13, 15

$$8 = \sqrt{\frac{(7-10.25)^2 + (8-10.25)^2 + \dots + (15-10.25)^2}{8-1}}$$

8 = 2.65922

As you can see the s.d. remains the same unless you multiply every value by a constant

PAST EXAMINATION QUESTIONS:

MAY 2018

Ouestion1

If the variables x and z are so related that z = ax + b for each x = x₁ where a and b are constant, then $\overline{Z} = a\overline{X} + b$

(a) True	(b) False
(c) Both	(d) None
Answer: a	
Explanation:	
If the variable 'X' and 'Z' are so related t	that $Z = ax + b$ for each x
= x; where and a and b are constant the	n Z=ax + b then it is true.
Question2	
Relation between mean, median and	mode is:
(a) Mean-mode = 2 (mean – median)	(b) Mean-median = 3(r
(c) Mean-median = $2 (mean - mode)$	(d) Mean-mode = $3(me$

(c) Mean-median = 2 (mean - mode) (d) Mean-mode = 3(mean- median) Answer: d **Explanation**: We know that Mode = 3 Median - 2 Mean

Mode – Mean = 3 Median – 2 Mean – Mean Mode – Mean = 3 (Median – Mean)

Mode – Mean = 3 (Median – Mean)

an-median = 3(mean - mode)

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Mean – Mode = 3 (Mean – Median)	
Question3	
$\frac{(Q_3-Q_1)}{(Q_3+Q_1)}$ is known as	
(a) Coefficient of Range	(b) Coefficient of Q.D
(c) Coefficient of S.D	(d) Coefficient of M.D
Answer: b	
Explanation:	
Coefficient of Q.D =. $\frac{(Q_3 - Q_1)}{(Q_3 + Q_1)}$	
Question4	
If each item is reduced by 15 A. M is	
(a) Reduced by 15	(b) Increased by 15
(c) Reduced by 10	(d) None
Answer: a	
Explanation:	A.M. is reduced because the shifting of origin,
the A.M. is changed.	A.M. 13 Feduced because the shifting of origin,
Question5	
For 899, 999, 391, 384, 390, 480, 760	
(a) 2.75	(b) 8.25
(c) 5.5	(d) none
Answer: c Explanation:	
Write the terms in Ascending order 111	240 384 391 480 590 760 899 999
Here No of observations (N) = 10	, 210, 301, 391, 100, 390,700, 00, 399, 999.
Median $(m_e) = \left[\frac{n+1}{2}\right]^{th}$ term	
$=\left[\frac{10+1}{2}\right]^{th}$ term	
= 5.5^{th} term Rank of median (m_e) = 5.5	
Question 6 The average of a series of overlappin	g averages, each of which is based on a
certain number of item within a serie	
(a) Moving average	(b) Weighted average
(c) Simple average	(d) None
Answer: a	
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Explanation:

The average of a series of over lapping averages, each of which based on a certain number of item within a series is known as Moving Average.

Question 7 If the S.D. of the 1st n natural Nos. is $\sqrt{30}$. Then the value of n is (b) 20(a) 19 (c) 21 (d) None Answer: a **Explanation:** S.D of first 'n' natural numbers $=\sqrt{\frac{n^2-1}{12}}$ $=\sqrt{30}=\sqrt{\frac{n^2-1}{12}}$ On squaring both side $30 = \frac{n^2 - 1}{12}$ $360 = n^2 - 1$ $n^2 = 360 + 1$ $n^2 = 361$ $n = \sqrt{361}$ n = 19 **Ouestion 8** If the random variables x and v are related by Y=2-3x, then the SD of v is given by (b) $-3 \times SD$ of x (a) $3 \times SD$ of x (c) $9 \times SD$ of x (d) $2 \times SD$ of x Answer: a **Explanation: Given equation** Y = 2-3x3x+y-2 = 0 $b = \frac{-coefficient of x}{coefficient of y} = \frac{-3}{1} = -3$ S.D of y = |b| S.D of x = |-3|. SD of x $3 \times SD \text{ of } x$ **NOV 2018**

Question 1

The median of the data 5, 6, 7, 7, 8, 9, 10, 11, 11, 12, 15, 18 and 19 is (b) 10 (a) 10.5

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(d) 11.5

(c 11 Answer: a

Explanation:

Write the term is Ascending 5, 6, 7, 7, 8, 9, 10, 11, 11, 12, 15, 18 and 19

Here, No. of terms (N) = 14 Median = $\frac{1}{2} \left[\frac{N^{th}}{2} term + \left[\frac{n+1}{2} \right]^{th} term \right]$ $\frac{1}{2} \left[\frac{14^{th}}{2} term + \left[\frac{14+1}{2} \right]^{th} term \right]$ $\frac{1}{2} [7th term + 8th term]$ $\frac{1}{2} [10+11]$

 $\frac{1}{2} \times [21]$ 10.5

Question2

The mean of 20 items of a data is 5 and if each item is multiplied by 3, then the new mean will be

(a) 5	(b) 10
(c) 15	(d) 20
Answer: c	
Explanation:	
By shifting the scale Mean is changed	
New mean = K x original mean = 5	
K = 3	
New mean= 3×5	
= 15	
Question 3 The Geometric mean of 3, 6, 24, and (a) 8	l 48 is (b) 12
(c) 24	(d) 6
Answer: b Explanation:	(u) 0
G.M. = $(x_1 x_2 x_3 x_4)^{\frac{1}{4}}$	{Here, n =
$(3 \times 6 \times 24 \times 48)^{\frac{1}{4}}$	
$=4\sqrt{3\times6\times24\times48}$	
$= 4^2 \sqrt{3 \times 3 \times 2 \times 2 \times 2 \times 2 \times 3 \times 2 \times 2}$	$2 \times 2 \times 2 \times 3$
= 2×2×3	
= 12	

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Question 4	
_	of a set of values from their arithmetic mean
is	
(a) > 0	(b) = 0
(c) <0 Answer: b	(d) None
Explanation:	
-	a set of value from their A.M is always zero.
Question 5	
Which one of the following is not a c	
(a) Mean Deviation	(b) Arithmetic mean
(c) Median	(d) Mode
Answer: a	
Explanation:	
M.D is not a central tendency.	
Question 6	
	nd maximum value in the set is 83, then the
minimum value in the set is	
(a) 74	(b) 9
(c) 18	(d) None of the above
Answer: c	
Explanation:	
Maximum Value (L) = 83	
Range (R) = 65	
Minimum Value (S) =?	
Range (R) = $L - S$ 65 = 83 - S	
S = 83 - 65	
S = 0.05 - 0.05 S = 18	
0 - 10	
Question 7	
	re 50, 60 and 90 and their means are 12, 15,
and 20 respectively, then the mean	
(a) 16	(b) 15.5
(c) 16.5	(d) 14.5
Answer: c	
Explanation:	x 10
$n_1 = 50$	$\bar{X}_1 = 12$
$n_2 = 60$ and	$\bar{X}_2 = 15$
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$ \begin{array}{ll} n_{3} = 90 & \bar{X}_{3} = 20 \\ Compared mean \bar{X} = \frac{n_{1}\bar{X}_{1} + n_{2}\bar{X}_{2} + n_{3}\bar{X}_{3}}{n_{1} + n_{2} + n_{3}} \\ \frac{50 \times 12 + 60 \times 15 + 90 \times 12}{50 + 60 + 90} \\ \frac{600 + 900 + 1800}{200} \\ \frac{3300}{200} = 16.5 \\ \hline \underline{3300}_{200} = 16.5 \\ \underline{900} \\ \underline{3300}_{200} = 16.5 \\ \underline{900} \\ \underline{15} \\ (b) 0.25 \\ (c) 17 \\ (d) 19 \\ Answer: b \\ Explanation: \\ Variance of 5, 7, 9 and 11 is 4, then the coefficient of variation is: (a) 15 (b) 0.25 \\ (c) 17 \\ (d) 19 \\ Answer: b \\ Explanation: \\ Variance of 5, 7, 9 and 11 is 4. \\ i.e. Variable = 4 \\ S.D (0) = \sqrt{4} = 2 \\ Mean (\bar{X}) = \frac{\sum x}{N} = \frac{5+7+9+11}{4} = \frac{32}{4} = 8 \\ CV = \frac{SD}{M} = \frac{2}{8} = \frac{1}{4} = 0.25 \\ \underline{9} \\ Standard deviation for the marks obtained by a student in test in mathematic (out of 50) as 30, 35, 25, 20, 15 is (a) 25 (b) \sqrt{50} \\ (c) \sqrt{30} \\ (d) 50 \end{bmatrix} $
$\frac{50 \times 12 + 60 \times 15 + 90 \times 12}{50 + 60 + 90}$ $\frac{600 + 900 + 1800}{200}$ $\frac{3300}{200} = 16.5$ Question 8 If the variance of 5, 7, 9 and 11 is 4, then the coefficient of variation is: (a) 15 (b) 0.25 (c) 17 (d) 19 Answer: b Explanation: Variance of 5, 7, 9 and 11 is 4. i.e. Variable = 4 S.D (0') = $\sqrt{4} = 2$ Mean $(\bar{X}) = \frac{5}{N} = \frac{5+7+9+11}{4} = \frac{32}{4} = 8$ $CV = \frac{5D}{M} = \frac{2}{8} = \frac{1}{4} = 0.25$ Question 9 Standard deviation for the marks obtained by a student in test in mathematic (out of 50) as 30, 35, 25, 20, 15 is (a) 25 (c) $\sqrt{30}$ (b) $\sqrt{50}$ (c) $\sqrt{30}$ (c) $\sqrt{30}$ (c) $\sqrt{50}$ (c) $\sqrt{50}$ (c) $\sqrt{30}$ (c) $\sqrt{50}$ (c)
$50 + 60 + 90$ $600 + 900 + 1800$ 200 3300 200 3300 200 3300 200 3300 200 3300 200 3300 200 3300 200 3300 200 3300 200 300 165 900 165 $(b) 0.25$ $(c) 17$ $(d) 19$ Answer: b Explanation: Variance of 5, 7, 9 and 11 is 4. i.e. Variable = 4 S.D (0) = $\sqrt{4} = 2$ Mean $(\bar{X}) = \frac{\Sigma_X}{N} = \frac{5+7+9+11}{4} = \frac{32}{4} = 8$ $CV = \frac{SD}{M} = \frac{2}{8} = \frac{1}{4} = 0.25$ Question9 Standard deviation for the marks obtained by a student in test in mathematic (out of 50) as 30, 35, 25, 20, 15 is (a) 25 (b) $\sqrt{50}$ (c) $\sqrt{30}$ (d) 50
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(a) 25 (b) $\sqrt{50}$ (c) $\sqrt{30}$ (d) 50
(c) $\sqrt{30}$ (d) 50
Answer: b
Explanation:
Given data's are
15, 20, 25, 30, 35
Mean $(\bar{X}) = \frac{\sum X}{N} = \frac{15+20+25+30+35}{5} = \frac{125}{5} = 5$
For S.D
x \overline{X} d = x - \overline{X} d ²
15 25 -10 100
20 25 -5 25
25 25 0 0
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30 35	25 25	5 10	25 100
N=5			$\sum_{n=250}^{\infty} d^2$
$\sum d^2$	250		

$$SD = \sqrt{\frac{\Sigma d^2}{N}} = \sqrt{\frac{250}{5}} = \sqrt{50}$$

Question10

If in a moderately skewed distribution, the values of mode and mean are 32.1 and 35.4 respectively, then the value of the median is

	· •	
(a) 34.3		(b) 33.3
(c) 34		(d) 33
Answer: a		

Explanation:

Given Mode = 32.1, Median =? Mean = 35.4 Mode = 3 Median - 2 Mean 32.1 = 3 Median - 2 × 35.4 32.1 = 3 Median - 70.8 Median = 32.1 + 70.8 Median $\frac{102.9}{3}$ = 34.3

Question11

If the standard deviation for the marks obtained by a student in monthly test is 36. Then the variance is:

(a) 7 (c) 8			(b) 5 (d) 11
Х	f	F. x	
2	3	6	
4	2	8	
6	3	18	

0	0	10
10	1	10
P+5		2P + 10
N = 11	\sum	fx = 2P + 52

Answer: a

Explanation:

 $\overline{X} = \frac{\sum fx}{2P + 52}$

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Given						
$\bar{X} = 6$						
$\frac{6}{1} = \frac{2P+52}{11}$						
2P + 52 = 66						
2P = 14						
P = 7						
<u>MA</u>	<u>Y 2019</u>					
Question1						
The AM of 15 observations is 9 and th	e AM of first 9 observations is 11 and the					
AM of remaining observation is						
(a) 11	(b) 6					
(c) 5 Answer: b	(d) 9					
Explanation:						
15 OBSERVATION = 9						
9 OBSERVATION = 11						
\overline{x} of 15 0 Σ_{x_1} 0						
$\overline{x_1} \text{ of } 15 = 9 = \frac{\Sigma_{x_1}}{9} = 9$ $\overline{x_2} \text{ of } 9 = 11 = \frac{\Sigma_{x_2}}{9} = 11$						
$\overline{x_{2}}of 9 = 11 = \frac{\Sigma_{x_{2}}}{11} = 11$						
-						
$\sum x_1 = 15 \times 9 = 135$ \sum x_2 = 11 \times 9 = 199						
Remaining $\sum x_1 - \sum x_2 = 135 - 99 = 36$						
$\bar{x}_{30} = \frac{36}{6} = 6$						
$x_{30} - \frac{1}{6} = 0$						
Question2						
-	the values of mean & median are 12 & 18					
respectively. The value of mode is						
(a) 6	(b) 12					
(c) 15	(d) 30					
Answer: d						
Explanation:						
Mean – mode = 3(Mean – Median) Put the value in this equation						
= 12 - mode = 3(12-18)						
= 30						
Question3						
Which of the following is positional average?						
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(c) I							(b) GM (d) AM	
	wer: a lanati							
				-			erage: the median and the mode. The median is the half values are less than the median and half the	
value	es are	e grea	iter that	an the	e med	dian. I	The mode, the second positional average, shows a	
nigne	er fre	quen	cy in t	he se	ries z			
-	<u>stion</u> ₄ the di		oution	1				
X	1	2	3	4	5	6		
F	6	9	10	14	12	8		
		e of m	nedia	n is				
(a) 3 (c) 4							(b) 3 (d) 5	
	wer: o	с						
	lanati							
X					f		c f	
1					6		6	
2					9		15	
3					10		25	
4					14		39	
5					12		51	
6 Tet	1				8		59	
Tota	al				59			
$\frac{N+1}{2}$:	= 30							
_	ledia	n be	4					
Question5								
-			ric dis	stribi	ition			
	-						(b) Mode = 3 Median – 2 Mean	
(a) Mean = Median = Mode (c) Mode = $\frac{1}{3}$ median = $\frac{1}{2}$							(d) None	
		5	10010	2				
_	Answer: a Explanation:							
Блрі	anau	UII.						

In a symmetric distribution, the mean, mode and median all fall at the same point. The mode is the most common number and it matches with the highest peak (the "mode" here is the different from the "mode" in bimodal or unimodal, which refers to the number of peaks).

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Ouestion6 If = (O^2) 100 and coefficient of variation = 20% then \overline{x} = (a) 60 (b) 70 (c) 80(d) 50**Answer: d Explanation:** $O^2 = Variance$ To find SD = O' $SD = \sqrt{100} = 10$ Coef. Of V = $\frac{\sigma}{x}$ $20 = \frac{10}{x} \times 100$ $\bar{x} = \frac{10}{20} \times 100$ $\bar{x} = 50$ **Question7** Coefficient of quartile deviation is $\frac{1}{4}$ then $\frac{Q_3}{Q_1}$ is (a) $\frac{5}{3}$ (b) $\frac{4}{3}$ (c) $\frac{3}{4}$ (d) $\frac{3}{5}$ (c) $\frac{3}{4}$ Answer: a **Explanation:** $\frac{1}{4} = \frac{Q_3 - Q_1}{Q_3 + Q_1}$ Talking option a $Q_3 = 5 \& Q_1 = 3$ $\frac{5-3}{5+3} = \frac{2}{8} = \frac{1}{4}$ **Question8** Standard deviation is _____ times of $\sqrt{MD \times QD}$ (b) $\frac{4}{5}$ (a) $\frac{2}{3}$ (d) $\sqrt{\frac{8}{15}}$ (c) $\sqrt{\frac{15}{8}}$

Answer: c Explanation:

 $MD = \frac{4}{5}SD$ 4SD = 5MD = 6QD

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 $SD = \frac{5}{4}MD = \frac{6}{4}QD$ $SD = \sqrt{\frac{5}{4} \times \frac{6}{4}} = \sqrt{\frac{30}{16}} = \sqrt{\frac{15}{8}}$ **Question9** Standard Deviation of first five natural numbers. (a) $\sqrt{\frac{n^2+1}{6}}$ (b) $\sqrt{\frac{n^2-1}{12}}$ (c) $\sqrt{\frac{n^2-1}{12}}$ (d) $\sqrt{\frac{n^2-1}{6}}$ Answer: b **Explanation:** Mean, $u = \frac{(1+2+3.....+n)}{n}$ $\therefore \mathbf{u} = \frac{1}{2}(n + 1)$ Variance, $\sigma^2 = \frac{\sum (x_i - \mathbf{u})^2}{n} = \frac{\sum x_i^2}{n} - u^2$ $:: \sigma^2 \frac{\sum n^2}{n} - \frac{1}{2}(n+1)^2$ $\therefore \sigma^2 \frac{1}{n} \frac{n(n+1)(2n+1)}{n} - \left(\frac{1}{2}(n+1)\right)^2$ $\therefore \sigma^2 = \frac{n^2 - 1}{12}$ Standard Deviation, S.D = $\sqrt{\sigma^2}$ \therefore S.D=\sqrt{\dfrac{n^2-1}{12}} **Question10** The Q.D. of 6 numbers 15, 8, 36, 40, 38, 41 is equal to (a) 12.5 (b) 25 (c) 13.5 (d) 37 **Answer: c Explanation:** $Q_1 = \left(\frac{n+1}{2}\right)^{th}$ of $= \left(\frac{6+1}{4}\right)^{th}$ of $= \left(\frac{7}{4}\right)^{th}$ of 1.75th 8+0.75(15-8)8+5.25 $0_1 = 13.25$ $Q_3 = 3\left(\frac{n+1}{2}\right)^{th}$ of $= 3\left(\frac{n+1}{2}\right)^{th}$ of $3 \times \frac{7}{4} = 3 \times 1.75 = 5.25$ $Q_3 = 5^{\text{th}} \text{ of } + 0.25(6^{\text{th}} - 5^{\text{th}})$ 40+0.25(41-40) $Q_3 = 40.25$

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FOR ENQUIRY - 6262969604 6262969699 $QD = \frac{Q_3 - Q_1}{2} = \frac{40.25 - 13.25}{2}$ 13.5 **NOV 2019 Ouestion1** The approximate ratio of SD, MD, Q D is: (a) 3:4:5 (b) 2:3:4 (c) 15:12:10 (d) 5:6:7 **Answer: c Explanation:** (c) We know that 4SD = 5MD = 6QDNet 4SD = 5MD = 6QD = KSo. $SD = \frac{K}{4}, MD = \frac{K}{5}; QD = \frac{K}{6}$ Now, SD: MD: QD $=>\frac{K}{4}:\frac{K}{5}:\frac{K}{6}$ $= \frac{4}{30K} : \frac{5}{120} : \frac{6}{24K} : \frac{20K}{120} [:: \text{ LCM } OF \text{ 4, 5,6 is 120}]$ => 30:24:20 => 15:12:10 so, SD:MD: QD = 15:12:10 **Ouestion2** The deviations are minimum when taken from: (b) Median (a) Mean (d) None (c) Mode **Answer: b Explanation:** (b) The sum of deviations are minimum when taken from median $\sum |x - Mean|$ $\sum |x - Median| \{Minimum\}$ $\sum |x - Mode|$ **Ouestion3** If the AM & GM of two numbers are 30 and 24 respectively. Find the no's (a) 12 and 24 (b) 48 and 12 (c) 30 and 30 (d) 40 and 20 **Answer: b Explanation:** For more Info Visit - www.KITest.in

(b) Let the two no's be a and b AM = 30GM = 24 $\frac{a+b}{a+b} = 30$ $\sqrt{ab} = 24$ (-2)a + b = 60a = 60 - b(-1) put eq 1 in eq 2 $\sqrt{(60-b)b} = 24$ (on squaring both sides) (60 - b)b = 576 $60b - b^2 = 576$ $b^2 - 60 b + 576 = 0$ $b^2 - 48 b - 12 b + 576 = 0$ b(b-48) - 12(b-48) = 0(b-12)(b-48) = 0or b = 48 b = 12 a = 60 – b a = 60 – 48 a = 48 a = 12 (12, 48) or (48, 12) So the two no's are 48 and 12 # After Method [Do by hit and trial] i.e. try with the given options whether their AM is 30 and GM 24 **Ouestion4** Origin is shifted by 5, what will happen (a) SD will increase by 5 (b) QD will increase by 5 (c) MD will increase by 5 (d) There will be no change Answer: d **Explanation**: (d) SD is not affected of remains in changed by shifting of origin. So here if the origin is shifted by 5 there will be no change in SD. **Question5 Coefficient of variation is equal to:** (a) $\frac{SD}{Mean}$ (b) $\frac{SD}{\frac{Mean}{Mean}} \times 100$ (d) $\frac{Mean}{SD}$ (c) $\frac{Mean}{SD} \times 100$ **Answer: b Explanation:** (b) In probability theory and statistics the coefficient of variation also known as relative standard deviation is a standardized measure of dispersion of frequency distribution. For more Info Visit - www.KITest.in join our telegram channel @Ca foundation quiz group

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It is expressed as a percentage and defined as the ratio of SD and mean.									
SD so. Coeffic	SD so. Coefficient of variation = $\frac{SD}{Mean} \times 100$								
Mean									
Question6	Question6								
Find mode of the following date									
3 - 6	6 - 9	9 - 12	12 - 15	15 - 18	18 - 21	7			
2	5	10	23	21	10 21	_			
	5	10	23	21	14				
(a) 14			(b) 15						
(c) 16.5			(d) 14.6						
Answer: d			(4) 11.0						
Explanation									
(c) CI f									
3 - 6 2 6 - 9 5									
9 – 12									
	23×Modal class	\$							
15 - 18 2		5							
	2								
	e highest freq	uency. so 12 -	- 15 is the mo	dal class.					
So, $f_1 = 23$, $f_0 = 10$, $f_2 = 21$ L ₁ = 12 i = 3									
Mode = $L_1 + \frac{f_1 - f_0}{2f_1 - f_0 - f_2}$ xi									
23-10									
$= 12 + \frac{23 - 10}{2(23) - 10 - 21} \times 3$									
2(23)-10-21									
$= 12 + \frac{13}{15} \times 3$									
= 12 + 2.599									
= 14.59									
= 14.6 (approx)									
Question7									
Question7 Find SD of th	no following								
Find SD of th 1, 2, 3, 4, 5, 6									
(a) 2.58	J, 7, 0, 9		(L) ⁶⁰						
			(b) $\frac{60}{9}$						
(c) $\frac{60}{3}$			(d) 3.20						
Answer: a									
Explanation	:								
(a) SD = $\sqrt{\frac{\Sigma X2}{N}}$	$\frac{2}{2} - \left(\frac{\Sigma X}{N}\right)^2$								
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	5	C		1 0	•				

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Here N = 9 $x^{2} = 1^{2} + 2^{2} + 3^{2} + 4^{2} + \dots 9^{2}$ = 285 $\frac{\sum X}{N} = \frac{1+2+3+4+5+6+7+8+9}{9} = 5$ Put in above formula, $SD = \sqrt{\frac{285}{9} - \frac{25}{1}}$ $SD = \frac{\sqrt{60}}{9}$ $SD = \sqrt{6.67}$ SD = 2.58

Question8

If mean = 200 and variance = 80. Find coefficient of variation.

(b) 4.47 (d) 0.32

 $SD = \sqrt{Variance}$

$\prod_{i=1}^{n} \prod_{i=1}^{n} \prod_{i$
(a) 2.56
(c) 32
Answer: b
Explanation:
(b) We know
$CV = \frac{SD}{Mean} \times 100$
$CV = \sqrt{\frac{Variance}{Mean}} \times 100$
$CV = \sqrt{\frac{80}{200}} \times 100$
$CV = \sqrt{\frac{80}{2}}$
CV = 4.47 (approx.)

Question9

(a) SD

(c) QD

Which of the following is affected by shifting of scale.

(b) MD (d) None of these

Answer: a

Explanation:

(a) Since SD, MD, QD are measures of absolute dispersion, So, a change in scale neither affect SD nor MD and QD.

Question10		
Histogram is used for to re	present	
(a) Mode	(b) Median	
(c) Percentile	(d) Quartile	
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Answer: a

Explanation:

(a) Histogram is a graphical representation of grouped frequency distribution. It is used to locate mode. X – axis- class interval y-axis- frequency.

Question11

Coefficient of variation is 80. Mean is 20. Find variance:

(a) 640 (b) 256 (c) 16 (d) 250 **Answer: b Explanation:** (b) We know, Coefficient of variation (CV) = $\frac{SD}{Mean} \times 100$ Here mean = 20 ; CV = 80 $80 = \frac{S.D}{Mean} \times 100$ S.D. = 16 Variance = $(S.D.)^2$ Variance = $(16)^2 = 256$

Question12

Find the median of the following.

		40.00		00 10		1		
CI	0 -10	10 - 20	20 - 30	30 - 40	40 - 50			
f	2	3	4	5	6			
(a) 35			(b)	32				
(c) 36			(d)	37.5				
Answer: b								
Explanatio	on:							
	CI		f			c .f		
	0-10		2			2		
	10-20		3		5			
	20-30		4		9			
	30-40		5		14			
		6		20				
$\sum f = 20$								
N = 20								
So 30 – 40	is the medi	an class						
L, = 30 C =	Pre. Cof. of i	median clas	SS					
C => 9 F => 5								
Median = 4	$\left(\frac{N}{2}-c\right)$							
Median = 4	$r + \frac{f}{f} \times l$							

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$= 30 + \left(\frac{10-9}{5}\right) \times 10$ = 30+2 = 32

Question13

Difference between upper limit and lower limit of a class is known

(a) Range

(c) Class size

(b) Class mark(d) Class boundary

Answer: c

Explanation:

- (c) Difference between upper limit and lower limit of class is class size.
- Range = Largest value Smallest value
- Class mark = (Lowest Limit+Upper Limit)
- Class boundary = Class interval of exclusive data series.

Question14

Find the made of the following:						
0 - 10 10 - 20 20 - 30 30 - 40 40 - 50 50 - 60						

0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	
7	14	22	34	20	19	
(a) 32				(b) 34.61		
(c) 25.42				(d) 35		
Answer: b)					
Explanati	on:					
CI				f		
0 - 10				7		
10 - 20				14		
20 - 30				22		
30 - 40				34		
40 – 50				20		
50 - 60				19		
Since 34 is	the highe	est frequer	ncy so, 30 -	- 40		
$F_1 = 34 f_0 =$	$= 22 f_2 = 20$)				
i=10						
Mode = L_1	$+\frac{f_1 - f_0 \times i}{2f_1 - f_0 - f_2}$	-				
= 30	$+\frac{(34-22)}{2\times34-22}$	$\frac{2}{-20} \times 10$				

$= 30 + \frac{12}{26} \times 10$

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= 34.61

Question1						
CI	n edian of t 0 – 10	the follow	ng: 20 - 30	30 - 40	40 - 50	
f	5	10 - 20	28	10	2	
(a) 10.57	5	15		b) 23.57	2	
(c) 25				d) None		
Answer: b			(ajnone		
Explanati						
CI		f			c.f	7
0 - 10		5			5	
10 - 20		15			20	
20 - 30		28			48*	
30 - 40		10			58	
40 - 50		2			60	
$\int f = 60$						
$\frac{30}{40 - 50}$ $\frac{10}{2} = \frac{60}{2} = \frac{10}{2}$						
$\frac{1}{2} = \frac{3}{2} = \frac{3}{2}$	30					
	is the med	ian class				
$L_1 = 20 L =$	30					
C – 20 f – 2						
Median = I	$L_1 + \frac{\left(\frac{N}{2} - C\right)}{f} \times f$	i				
$= 20 + \frac{(30-2)}{2}$	$\frac{-20)}{-20} \times 10$					
= 23.57	8					
- 20.07						
Question 1	16					
-	x_i) is equal	l to				
(a) $x \sum_{i=1}^{n}$	<u> </u>		(b) n ($x \sum_{i=1}^{n} x_{i=1}^{n}$	(\overline{xl})	
(c) $\bar{x} - n$				d) zero	1 /	
Answer: d				,		
Explanati	on:					
(d) $\sum_{i=1}^{n} (x_{i})$	$-x_i$)					
Since the s	um of devia	ations abou	at their AM	I is always	zero.	
Question1			0.47.70			
	umbers 1,	4, 5, 7, 8 i			l to each them SD will be	
(a) 12.45			-	b) 24.5	ahanga	
(c) 12				d) will not	change	
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Answer: d

Explanation:

(d) We know a change in origin of SD causes no change in SDSo, New SD = Original SD when 10 will be addedSo, SD will not change .

DEC 2020

Question1

Given the weights for the numbers 1, 2, 3,.....n are respectively 1^2 , 2^2 , 3^2 ,.... n^2 . Then weighted HM is _____

(a) $\frac{2n+1}{4}$ (c) $\frac{2n+1}{3}$



Answer: c

Explanation:

Since the harmonic mean is the reciprocal of the average of reciprocals, the formula to define the harmonic mean "HM" is given as follows:

If x₁, x₂, x₃,..., x_n are the individual items up to n terms, then,

Harmonic Mean, HM = n / $[(1/x_1)+(1/x_2)+(1/x_3)+...+(1/x_n)]$. Hence = $\frac{2n+1}{2}$

Question2

Which measure is suitable for open - end classification?

(a) Median	(b) Mea
(c) Mode	(d) GM
Answer: a	

Explanation:

For open end classification median is the best measure of central tendency. Median is the most suitable central tendency measure when there are some extreme scores in data distribution and also when there is a skewed data set.

Question3

50th	percenti	ile is ec	ual to

(a) Median

(c) Mean

Answer: a

Explanation:

The 50th percentile is generally the median (if you're using the third definition—see below). The 75th percentile is also called the third quartile. The difference between the third and first quartiles is the interquartile range.

(b) Mode

(d) None

Question4

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	dian and Mode are 23, 24 and 25	5.5 respectively, then
it is most likely skewed of (a) Positively (c) Asymptotically Answer: d Explanation:	listribution (b) Symmetrical (d) Negatively	
For Negatively skewed means	is likely to be less than mode and r	nedian
Question5 If any two numbers are in Al (a) AM x HM (c) M x Z Answer: a	P, then GM ² = (b) AM + HM (d) AM x M	
Explanation: The relationship between AM, AM x HM = GM ²	GM and HM is given by:	
Question6 Two values yielded an arith geometric mean of these val	metic mean of 24 and a harmoni	c mean of 6. The
(a) 8 (c) 14 Answer: b Explanation: $GM = \sqrt{AM \times HM}$ $GM = \sqrt{24 \times 6}$ $GM = \sqrt{144}$ GM = 12	(b) 12 (d) 16	
Question 7 The HM of A and B is 1/3 and	d HM of C and D is 1/5. Then HM	of A, B, C and D is
(a) $\frac{\frac{8}{15}}{\frac{15}{8}}$ (c) $\frac{\frac{15}{8}}{\frac{15}{8}}$ Answer: d Explanation: AB-1/3 & CD-1/5 HM of ABCD = n/2 $\frac{\frac{1}{3} + \frac{1}{5}}{2} (\frac{n}{2}) = \frac{8}{30} = \frac{4}{15}$	(b) $\frac{1}{4}$ (d) $\frac{4}{15}$	
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Question 8		
Which one of these is least aff	ected by extreme values?	
(a) Mean	(b) Median	
(c) Mode	(d) None	
Answer: b		
Explanation:		
Median is the middle most value	e of a given series that represents	s the whole class of the
-	average, it is calculated by obser	
_	of the series which. Therefore, m	nedian is not affected
by the extreme values of a serie	S.	
Question9		
Ten matches' data is given. Th	en which of the following canr	not be found?
(a) Least Score	(b) Highest Score	
(c) Best Score	(d) Median Score	
Answer: c		
Explanation:		
From Best Score method we car	n do this	
Our action 10		
Question10	bers are 6 and 9 respectively, t	hon (Mic
(a) 7.35	(b) 8.5	
(c) 6.75	(d) None	
Answer: a	(u) None	
Explanation:		
-	Arithmetic Mean, Harmonic Mear	and Geometric Mean
of Two Numbers:	in termetre mean, marmonie mean	i, and debined ie Mean
$A.M. \times H.M. = (G.M.)^2$		
\Rightarrow G.M. = 7.35		
Question11		
Which of the following measu	re of dispersion is based on ab	solute deviations?
(a) Range	(b) SD	
(c) Mean Deviation	(d) Quartile Deviation	
Answer: c		
Explanation:		
_	information than range or the Qu	
	ues. The Mean Deviation does not	
_	t should likely to be used in situa	tion where such
deviations are likely to occur.		
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<u>JAN 2021</u>

<u>JAI</u>	<u>N 2021</u>
Question1	
From the records on sizes of shoes so	ld in a shop, one can compute the following
to determine the most preferred shoe	size.
(a) Mean	(b) Median
(c) Mode	(d) Range
Answer: c	
Explanation:	
The number which appears most often in	n a set of numbers. Example: in {6, 3, 9, 6, 6, 5,
9, 3} the Mode is 6	
Question2	
Which of the following measure does	not possess mathematical properties?
(a) Arithmetic mean	(b) Geometric mean
(c) Harmonic mean	(d) Median
Answer: d	
Explanation:	
Median Properties - The median value is	fixed by its position and is not reflected by the
individual value. The distance between t	he median and the rest of the values is less
than the distance from any other point. I	Every array has a single median. Median cannot
be manipulated algebraically. Hence, Me	edian does not possess mathematical
properties	
Question 3	
If $y = 3 + (4.5) x$ and the mode for x-va	llue is 20, then the mode for y-value is
(a) 3.225	(b) 12
(c) 24.5	(d) 93
Answer: d	
Explanation:	
y = 3 + (4.5)x	
x is 20	
$y = 3 + 4.5 \times 20$	
y = 93	
Because Mode is affected by change of or	rigin & scale both
Question 4	
	observations and H ₁ and H ₂ are respective
harmonic means, then the harmonic r	
(a) $\frac{n_1 H_1 + n_2 H_2}{m_1 + m_2}$	(b) $\frac{n_1H_1+n_2H_2}{H_1+H_2}$
n_1+n_2	$H_1 + H_2$

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(c) $\frac{n_1 + n_2}{n_1 H_1 + n_2 H_2}$ Answer: d	(d) $\frac{(n_1+n_2)H_1H_2}{n_1H_2+n_2H_1}$
Explanation: $(n_1 + n_2)H_1H_2$	
$n_1H_2 + n_2H_1$	
Question 5 The best statistical measure used fo	r comparing two series is
(a) Mean absolute deviation	(b) Range
(c) Certificate of variation	(d) Standard deviation
Answer: c Explanation:	
The coefficient of standard deviation is	calculated by dividing the standard deviation of
	ying it by 100. It is regarded as the best measure series because it is expressed in percentage.
Question 6 The relationship between P-series a range of P – series is 18. What would	nd Q-series is given by 2P – 3Q – 10. If the
(a) 10	(b) 15
(c) 9	(d) 12
Answer: d	
Question 7 It is given that the mean (\overline{X}) is 10 an	d standard deviation (s.d.) is 3.2. If the
	en the new mean and standard deviations
are: (a) $\bar{x} = 10$, s.d. = 7.2	(b) $\bar{x} = 10$, s.d. = 3.2
(c) $\bar{x} = 14$, s.d. = 3.2	(d) $\bar{x} = 14$, s.d. = 7.2
Answer: d Explanation:	
$\bar{x} + 4 = New Mean$	
$\bar{x} = 10 + 4 = 14$	
Mean is affect by change in origin S.D. = σ + 4	
S.D. = 3.2 + 4 = 3.2	
as SD is not affected by change of origin	n
Question 8	
Which one of the following is a relat	ive measure of dispersion?
(a) Range	(b) Mean deviation
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FOR ENQUIRY - 6262969604 6262969699 (d) Coefficient of quartile deviation (c) Standard deviation Answer: d **Explanation:** The relative Measures of dispersion are: Coefficient of Variation, Coefficient of Quartile Deviation, Coefficient of Mean Deviation **Ouestion 9** Find the coefficient of mean deviation about mean for the data: 5, 7, 8, 10, 11, 13, 19 (b) 28.57 (a) 17.28 (c) 32.12 (d) 18.56 **Answer: c Explanation**: Mean $(\overline{x}) = \frac{5+7+8+10+11+13+19}{7} = \frac{54}{7} = 7.714$ $|x_i - \overline{x}|$ 2.271 5 0.714 7 8 0.29 2.29 10 11 3.29 13 5.29 14.15 $\sum |x_i - \overline{x}|$ **NOTE:**The correct Ans is: 32.12 **IULY 2021 Question 1**

Expenditures of a company (in Million Rupees) per item in various Years

Year	Item of Expenditures					
	Salary	Fuel and Transport	Bonus	Interest on Loans	Taxes	
1998	288	98	3.00	23.4	83	
1999	342	112	2.52	32.5	108	
2000	324	101	3.84	41.6	74	
2001	336	133	3.68	36.4	88	
2002	420	142	3.96	49.4	98	
What is avera	ge amount of	interest per y	ear which the	company had	to pay	

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during this period?	
(a) 33.66	(b) 36.66
(c) 31.66	(d) 39.66
Answer: Options (b)	
Question 2	
) is subtracted from each of these numbers the
	ed is -10. When 46 is subtracted from each of the
_	um of numbers, so obtained is 70. What is the
mean of the original n number (a) 56.8	(b) 25.7
(c) 49.5	(d) 53.8
Answer: Options (c)	(4) 55.6
Question 3	
The mean of 'n' observation is	'X'. If k is added to each observation, then the new
mean is	
(a) X	(b) XK
(c) X - K	(d) X + K
Answer: Options (d)	
Explanation: Let us take n observation X ₁	Y
If \overline{X} be the mean of the n observa	
$\overline{X} = \frac{1}{n} \sum_{i=1}^{n} X_i$	
**	
$ \sum_{i=1}^{n} X_i = n\overline{X} $	becompations. Then the observations becomes
$X_i + k$,, $X_n + K$	bservations. Then the observations becomes
	ervations. Then the observations becomes
$\overline{Y} = \frac{1}{n} \sum_{i=1}^{n} (X_i + k)$	
11	
$= \frac{1}{n} \sum_{i=1}^{n} X_{i} + \frac{1}{n} \sum_{i=1}^{n} k$	
$=\overline{X}+\frac{1}{n}.$ nk	
$=\overline{X} + k^{n}$	
Question 4	
If $y = 3 + 1.9 x$, and mode of x is	
(a) 15.9	(b) 27.8 (d) 21.5
(c) 35.7	(d) 31.5
Answer: Options (d)	
Question 5	
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The mean deviation of the numbers 3, 10 (correct to one decimal place)	J, 6, 11, 14,17,9,8,12 about the mean is	
(a) 8.7	(b) 4.2	
(c) 3.1	(d) 9.8	
Answer: Options (c)		
Question 6		
The standard deviation of 1 to 9 natural	number is	
(a) 6.65	(b) 2.58	
(c) 6.75	(d) 5.62	
Answer: Options (b)		
Question 7		
The probable value of mean deviation w	hen $Q_3 = 40$ and $Q_1 = 15$ is	
(a) 15	(b) 18.75	
(c) 17.50	(d) 0	
Answer: Options (a)		
Explanation: Q3=40 Q1=15		
QD = Q3 - Q1 / 2		
QD = 40-15 / 2		
=25 / 2		
=12.5		
WKT, 6QD=5MD=4SD		
MD= 6 * 12.5 /5 MD=15		
MD-15		
Question 8		
If the numbers are 5, 1, 8, 7, 2, then the c		
(a) 56.13%	(b) 59.13% (d) 44.13%	
(c) 48.13% Answer: Options (b)	(u) 44.13 <i>%</i>	
Question 9		
If every observation is increased by 7 the		
(a) Standard Deviation increases by 7	(b) Mean deviation increases by 7 (d) Quartile Deviation increases by 7	
(c) Not affected at all Answer: Options (c)	(d) Quartile Deviation increases by 7	
Question 10		
If a school has 14 teachers, their heights	(in cm) are:	
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	14.64	

172, 173, 164, 178, 168, 169, 173, 172, 173, 164, 178, 168, 169, 173, then average deviation of this data is (a) 2.43 approx. (b) 3.93 approx. (c) 3.43 approx. (d) 2.92 approx. **Answer: Options (c) Ouestion 11** If the relationship between x and y is given by 2x + 3y = 10 and the range of y is **10**, then what is the range of x? (a) 10 (b)18 (c) 8 (d) 15 **Answer: Options (d) DEC 2021 Question 1** If there are 3 observations 15, 20, 25 then the sum of deviation of the observations from their AM is (a) 0 (b) 5 (c) -5 (d) 10 **Answer:** a **Explanation:** Sum of deviations from their Arithmetic Mean is always zero. **Ouestion 2** If the AM and GM for 10 observations are both 15, then the value of HM is (a) less than 15 (b) more than 15 (c) 15 (d) cannot be determined **Answer**: **Explanation:** If both AM and GM are 15, it means that all the observations are constant, i.e., 15. Therefore. HM will also be 15. **Ouestion 3** If average mark for a group of 30 girls is 80, a group of boys is 70 and combined average is 76, then how many are in the boy's group? (a) 21 (b) 20 (c) 22 (d) 19 Answer: b **Explanation**: We have $n_1 = 30$; $\overline{X_1} = 80$; $n_2 = ?$; $\overline{X_2} = 70$; $=\overline{X} = 76$

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We know that $\overline{X} = \frac{n_1 \overline{X_1} + n_2 \overline{X_2}}{n_1 \overline{X_1} + n_2 \overline{X_2}}$	
$\binom{n_1+n_2}{(30\times80)} + (n_2\times70)$	
We know that $\bar{X} = \frac{n_1 \overline{X_1} + n_2 \overline{X_2}}{n_1 + n_2}$ Therefore, 76 = $\frac{(30 \times 80) + (n_2 \times 70)}{30 + n_2}$	
Now, try the options. $30 + h_2$	
Option (a) -21	
$RHS = \frac{(30 \times 80) + (21 \times 70)}{30 + 21} = 75.88 \neq 76$	
Option (b) - 20 $(30 \times 80) + (20 \times 70)$	
$RHS = \frac{(30 \times 80) + (20 \times 70)}{30 + 20} = 76 = LHS$	
30 ± 20	
Question 4	
If two variables a b and b are related by C	= ab then G.M. of c is equal to
(a) G.M. of a + G.M. of b	(b) G.M. of a x G.M. of b
(a) G.M. of a + G.M. of b (c) G.M. of a - G.M. of b	(d) G.M. of a / G.M. of b
Answer: b	
Explanation:	
If two variables a and b are related by c = ab b	o then GM of c = GM of a × GM of b
Oracetican F	
Question 5	modion is twice the mean then the
For a moderately skewed distribution the mode is times the median.	median is twice the mean, then the
(a) 3	(b) 2
(c) 2/3	(d) 3/2
Answer: b	(())))
Explanation:	
We know that for a moderately skewed distri	bution,
Mode = 3 Median - 2Mean Eq. (1)	
Given:	
Median = 2 Mean	
Therefore, Mean = Median/ 2	
Putting	
the value of Mean = Median $/ 2$	
in Eq. (1), we get:	
Mode= 3 Median - 2 Median) Mode= 3 Median - Median = 2 Median	
Therefore, Mode is two times of Median.	
Therefore, mode is two times of medial.	
Question 6	
The median value of the set of observation	ns 48, 36, 72, 87, 19, 66, 56, 91 is
(a) 53	(b) 87

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(c) 61	(d) 19
Answer: c	
Explanation:	
First, arrange the terms in ascending order:	
19, 36,48, 56, 66, 72, 87, 91	
Since the number of terms is even, i.e., 8, the path of the two middle terms is a 56 and 66	median will be obtained by the average of
the two middle terms, i.e., 56, and 66.	
Therefore, Median =56 + 66/2 = 61	
Median $-30 \pm 00/2 = 01$	
Question 7	
The marks secured by 5 students in a subj	ect are 82, 73, 69, 84, 66. What is the
coefficient of Range	
(a) 0.12	(b) 12
(c) 120	(d) 0.012
Answer: b	
Explanation:	
Coefficient of Range = $\frac{Largest \ Observation - Smal}{Largest \ Observation + Smal}$	
	l
Coefficient of Range $=\frac{84-66}{84+66} \times 100 = 12$	
Question 8	
For a data having odd number of values, th	
middle value is equal to the difference bet	
similarly the difference between the secon	-
second last and middle value so on. There	
	(b) Half of standard deviation
(c) Mode Answer: d	(d) Mean
Explanation:	
Here No. of data's = odd (let 3)	
i.e. a, b, c	
Difference b/w the 1 st and the middle value	
Diff. b/w the last and the middle value	
b-a=c-b	
2b = a + b	
$b = \frac{a+c}{2}$	
The middle value is known as mean and simil	arly other case is also satisfied
The initial value is known as mean and simil	arry other case is also substicu.
Question 9	
One hundred participants expressed their	opinion on recommending a new
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we duct to their friends using the attrib	auton most unlikelu not auno likelu most	-
likely. The appropriate measure of cent	outes: most unlikely, not sure, likely, most tral tendency that can be used here is	E
(a) Mean	(b) Mode	
(c) Geometric mean	(d) Harmonic mean	
Answer: b		
Explanation:		
One hundred participants expressed their	opinion on recommending a new product to)
their friends using the Attributes; most un	llikely, not sure, likely, most likely. The	
appropriate measure of central tendency t	that can be used here is Mode.	
Question 10		
•	partments, marked as 1, 2, 3, 4, 5. Number	r
	vailable. A bus stop is to be setup near one	
of the buildings so that the total distance	ce walked by the residents to the bus stop	
from their buildings must be kept mini	mum. One must consider involving	
to find the position of the bus s	stop.	
(a) Mean	(b) Mode	
(c) Median	(d) Weighted mean	
Answer:		
Explanation:		
	residents to the bus stop from their building	5
must DO kept minimum.		
Question 11		
Given that Mean = 70.20 and Mode = 70	· ·	
(a) 70.15	(b) 70.20	
(c) 70.30	(d) 70.35	
Answer:		
Explanation:		
Since Mean and Mode are different, this da		
For moderately skewed data, we know that Mode+2 Mean	at Mode= 3Median -2 Mean.	
Therefore, Median = $\frac{Mode+2 Mean}{3}$		
Median = $\frac{70.50 + (2 \times 70.20)}{3} = 70.30$		
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Question 1		
Which is not a measure of central tende	ency	
(a) Mean	(b) Median	
(c) Quartile deviation	(d) Mode	
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Answer: c

Explanation:

Quartile deviation is not a measure of central tendency.

Question 2

Mean Deviation of data 3, 10, 10, 4, 7, 18, 5 from mode is

(a) 4.39	(b) 4.14
(c) 4.70	(d) 5.24

Answer: b

Explanation:

Mean deviation from mode of following data 3, 10, 10, 4, 7, 18, 5 Here mode (Mo) = 10

Table =

X	Mode (Mo)	d = x-Mo
3	10	7
10	10	0
10	10	0
4	10	6
7	10	3
18	10	8
5	10	5
N= 7		Σ d = 29

M.D- $\frac{\sum |d|}{N} = \frac{29}{7} = 4.14$

Ouestion 3

<u>Question 5</u>	
A M and Coefficient of variat	tion of x is 10 and 40. What is the variance 30-2x
(a) 64	(b) 56
(c) 49	(d) 81
Answer: a	
Explanation:	
A.M of x = 10	
C.v. of $x = 40\%$	
$CV = \frac{S.D.}{10} \times 100$	
$CV = \frac{S.D.}{10} \times 100$ $40 = \frac{S.D.}{10} \times 100$	
S.D. = $\frac{40 \times 10}{100}$	
S.D = 4	
i.e. S.D of x=4	
Here Let $y = 30-2x$	
2x+y-30=0	

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$B = \frac{Coeff \ of \ x}{Coeff \ of \ y} = \frac{-2}{1} = -2$ S.D of y = |b| of S.D of x $= |-2| \times 4 = 2 \times 4 = 8$ = Variance of $y = (8)^2 = 64$ **Question 4** Which of the following is based on absolute deviation? (a) Standard deviation (b) Mean deviation (c) Range (d) Quartile deviation **Answer: b Explanation:** M. D is known as absolute deviation **Ouestion 5** When each value does not have equal importance then (a) A M (b) G M(c) H M (d) Weighted Average Answer: d **Explanation:** When each value does not have equal importance then we used weighted Average. **Question 6** Following are the wages of 8 workers 82, 96, 52, 75, 70, 65, 50, 70. Find range and coefficient of range? (a) 46, 32.70 (b) 43, 31.50 (d) 43, 32.70 (c) 46, 31.50 **Answer: c Explanation**: Here Smallest No (S) = 50Largest No (L) = 96 Range = L - S= 96-50= 46 Coeff. of Range = $\frac{L-S}{L+S} \times 100$ $\frac{96-50}{960+50}$ × 100 $=\frac{46}{146} \times 100$ = 31.50For more Info Visit - www.KITest.in

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Question 7 The mean of 20 observation is 38. If two observation are taken as 84 and 36 instead of 48 and 63 find new means. (a) 38.45 (b) 41.15 (c) 37.55 (d) 40.05 **Answer: c Explanation:** $\bar{X} = 38$ No of observation (N) = 20RightValues (R.V) = 48 + 63 = 111Wrong Values (W.V) = 84 + 36 = 120New (correct) mean = original mean + $\frac{R.V - W.V}{N}$ $= 38 + \frac{(111 - 120)}{2}$ 20 (-9) $= 38 + \frac{(-3)}{20}$ = 38 + 0.45= 37.55**Question 8** The 3rd decile for the numbers 15, 10, 20, 25, 18, 11, 9, 12 is (b) 10.70 (a) 13 (c) 11.00 (d) 11.50 **Answer: b Explanation:** Write the terms in Ascending order 9, 10, 11, 12, 15, 18, 20, 25 Here N = 8 $\mathbf{D}_3 = \left[\frac{3(N+1)}{2}\right]^{th}$ 3(8+1)]th th r27[°] 110 2.70th term $= 2^{\text{th}} \text{term} + 0.70 \text{ (3th term - 2th term)}$ =10 + 0.70(11 - 10) $= 10 + 0.70 \times 1$ = 10 + 0.70= 10.70

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Question 9	
Find the standard deviation and coeffici	
(a) 2.828, 49.32	(b) 2.828, 47.13
(c) 2.828, 48.13	(d) 2.828, 50.13
Answer: c	
Explanation:	
Given data	
1, 9, 8, 5, 7	
Mean $(\bar{x}) = \frac{\sum d^2}{N} = \sqrt{\frac{40}{5}} = \sqrt{8}$	
$=2\sqrt{2}$	
= .828	
$C.V = \frac{S.D}{AM} \times 100$	
$\frac{2.828}{6} \times 100 = 47.13\%$	
DEC	<u>2022</u>
Question 1	
If Mean (X) is = 10 and mode (Z) is = 7, t	hen find out the value of median (M)
a) 9	b) 17
c) 3	d) 4.33
Answer: Options (a)	
Explanation:	
Applying the relation between mean, media	an and mode formula,
Mode =3 Median –2 Mean	
Therefore, Median = $\frac{Mode+2Mean}{2}$	
3	
$=\frac{7+2\times10}{3}$	
= 27	
Median =9	
Question 2	
If the coefficient of variation and standa	rd deviation are 30 and 12 respectively,
then the arithmetic mean of the distribu	
a) 40	b) 36
c) 25	d) 19
Answer: Options (a)	
Explanation:	
C.V. – 30, S.D – 12	
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SD $CV = 100 \times \frac{100}{Mean}$ 100×12 30 = -Mean 1200 Mean = $\frac{1000}{30}$ = 40 **Ouestion 3** The relationship between two variables x and y is given by 4x-10 y = 20. If the median value of the variable x is 10 then what is median value of variable y? a) 1.0 b) 2.0 c) 3.0 d) 4.0 **Answer: Options (b) Explanation**: 4x - 10y = 20By Option b $4 \times 10 = -10 \times 2 = 20$ 40 - 20 = 20= 20 = 2.0**Question 4** Which one of the following is not a method of measures of dispersion? a) Quartile b) Mean deviation c) Range d) Standard Deviation **Answer: Options (a) Explanation**: In statistics, Quartile is not a measure of dispersion because it is the measure of central tendency. 2nd quartile is equal to median. Only range, mean deviation, standard deviation are the measure of dispersion. **Question 5** Mean deviation is minimum when deviation are taken from: a) Mean b) Median c) Mode d) Range **Answer: Options (b) Explanation**: The mean deviation is least when it is taken from median (A standard result). **Question 6** If the first quartile is 56.50 and the third quartile is 77.50, then the coefficient of quartile deviation is a) 638.09 b) 15.67 For more Info Visit - www.KITest.in 14.73 join our telegram channel @Ca foundation quiz group

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c) 63.80	d) 156.71
Answer: Options (b)	
Explanation:	
$Q_1 = 56.5$	
$Q_3 = 77.5$	
Coef. of QD = $\frac{Q_3 - Q_1}{Q_3 + Q_2} \times 100$	
$\frac{\text{Coef. of QD} = \frac{Q_3 - Q_1}{Q_3 + Q_1} \times 100}{\frac{77.5 - 56.5}{77.5 + 56.5} \times 100}$	
$\frac{1}{775 + 565} \times 100$	
$\frac{\frac{21}{134}}{134} \times 100 = 15.67$	
134	
Question 7	
The median of the observation 42, 72, 3	85 92 67 85 72 81 51 56 is
a) 69.5	b) 72
c) 64	d) 61.5
Answer: Options (a)	
Explanation:	
42, 72, 35, 92, 67, 85, 72, 81, 51, 56	
No' of observations (n) =10	
first of all we arrange the observations in a	an ascending order
35, 42, 51, 56, 67, 72, 72, 81, 85, 92	
Here observe that No' of observations (n)	is even so
Median is average of $\frac{n}{2}$ th term and $(\frac{n}{2}+1)$ the	h term
Median $\frac{\frac{n}{2}th term + (\frac{n}{2}+1)th term}{2}$	
$10 \qquad (10 \qquad)$	
$\frac{\frac{10}{2}th term + \left(\frac{10}{2} + 1\right)th term}{10}$	
5th term + 6th term	
2	
$=\frac{67+72}{1000000000000000000000000000000000000$	
120	
$=\frac{159}{2}$	
2 = 69.5	
- 09.5	
Question 8	
-	s to 3390. Number of observation are 30
and Standard deviation is 7, what is the	
a) 14	b) 11
c) 8	d) 5
Answer: Options (c)	
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Explanation :
$\Sigma \sqrt{\frac{\Sigma x^2}{n} - \left(\frac{\Sigma x}{n}\right)^2}$
$\sum \sqrt{\frac{\sum x^2}{n} - (x)^2}$
$72\frac{3390}{30} - (\bar{X})^2$
$49 = 113 - (\bar{X})^2$
$=(\bar{X})^2=113-49$
$(\bar{X})2 = 64$
$(\overline{X}) = 8$

Question 9

The mean of 50 observations is 36. If two observations 30 and 42 are to be excluded, then the mean of the remaining observation will be:

a) 36	b) 38
c) 48	d) 50
	uj 50
Answer: Options (a)	
Explanation:	

Expla

Sum of the 50 observations $=36 \times 50 = 1800$ Two observations 30 and 42 are excluded then sum of the remaining 48 observations =1800-[30+42]=1728 Therefore req. mean = 48 1728 = 36

Question 10

The average age of 15 students in a class is 9 years. Out of them, the average age of 5 students is 13 years and that of 8 students is 5 years. What is the average of remaining 2 students?

a) 5 years	b) 9 years
c) 10 years	d) 15 years

Answer: Options (b)

Explanation:

with option b applying combined AM method $5 \times 13 + 8 \times 5 + 2 \times 15$

15 Mean of 15 Student is 9

Ouestion 11

If Arithmetic Mean and Geometric Mean between Two numbers are 5 and 4 respectively, then these numbers are

a) 2&3	b) 2 & 8
c) 4 & 6	d) 1 & 16

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Answer: Options (b) Explanation: If the arithmetic mean is 5, therefore the sum of the two numbers is 10. Let the two numbers be x and 10 - xThe geometric mean is 4 So, $\sqrt[2]{x(10-x)} = 4$ On squaring both sides, we get X(10 - x) = 16 $\Rightarrow 10x - x^2 = 16$ $\Rightarrow x^2 - 10x + 16 = 0$ $\Rightarrow x^2 - 8x - 2x + 16 = 0$ $\Rightarrow x(x-8)-2(x-8)=0$ \Rightarrow (x-2)(x-8) = 0 $\Rightarrow x = 2 \text{ or } x = 8$ So, the required numbers are 2 and 8 **Ouestion 12** If Arithmetic mean between two numbers is 5 and Geometric mean is 4 then what is the value of Harmonic mean? a) 3.2 b) 3.4 c) 3.5 d) 3.6 **Answer: Options (a) Explanation**: We know If a and b are two positive numbers then, Therefore, we can conclude the relationship between A.M., G.M. & H.M. is: $G.M. = \sqrt{A.M. \times H.M.}$ Now, substituting A.M. = 5 & G.M. = 4, we get $4 = \sqrt{5 \times H.M.}$ Squaring both sides $\implies (4)^2 = (\sqrt{5 \times H.M.})^2$ $\implies 16 = 5 \times H.M.$ $\implies H.M. = \frac{16}{5}$ \implies H.M. = 3.2 Thus, the Harmonic mean between the two numbers is 3.2. **Ouestion 13** If the variance of given data is 12, and their mean value is 40, what is coefficient variation (CV)?

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a) 5.66%	b) 6.66%	
c) 7.50%	d) 8.65%	
Answer: Options (d) Explanation: Coef. of $\sigma^2 = \frac{\sigma}{x} \times 100$ $= \frac{\sqrt{12}}{40} \times 100$ = 8.65%		

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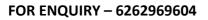
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CHAPTER - 15 PROBABILITY

PROBABILITY	The terms 'Probably' 'in all likelihood', 'chance', 'and odds in favor ',' odds against' are too familiar nowadays and they have their origin in a branch of Mathematics.		
RANDOM EXPERIMENT	An experiment is defined to be random if the results of the experiment depend on chance only.		
EXPERIMENT	An experiment may be described as a performance that produces certain results.		
EVENTS	The results or outcomes of a random experiment are known as events. Sometimes events may be combination of outcomes. The events are of two types: (i) Simple or Elementary, (ii) Composite or Compound		
MUTUALLY EXCLUSIVE EVENTS OR INCOMPATIBLE EVENTS	A set of events A_1 , A_2 , A_3 , is known to be mutually exclusive if not more than one of them can occur simultaneously		
EXHAUSTIVE EVENTS	The events A_1 , A_2 , A_3 , are known to form an exhaustive set if one of these events must necessarily occur.		
EQUALLY LIKELY EVENTS OR MUTUALLY SYMMETRIC EVENTS OR EQUI-PROBABLE EVENTS	The events of a random experiment are known to be equally likely when all necessary evidence are taken into account, no event is expected to occur more frequently as compared to the other events of the set of events.		
CLASSICAL DEFINITION OF PROBABILITY OR A PRIORDEFINITION	The probability of occurrence of the event A is defined as the ratio of the number of events Favorable to A to the total number of events. Denoting this by P (A), we have. P(A)= <u>No. of equally likely events Favorable to A</u> Total no. of equally likely events		

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	(a) Theprobabilityofaneventliesbetween0and1, both inclusive.
	When $P(A) = 0$, A is known to be an impossible event and when $P(A) = 1$, A is known to be a sure event.
	 (b) Non-occurrence of event A is denoted by A' or A^C The event A along with its complimentary A' forms a set of mutually exclusive and exhaustive events i.e., P(A) + P (A') = 1 P(A') = 1 - P(A)
	(c) The ratio of no. of favorable events to the no. of unfavorable events is known as odds in favor of the event A and its inverse ratio is known as odds against the event A i.e.,
	odds in favor of A = m _A : (m – m _A)
	and odds against A = (m - m _A) :m _A
REMEBERANCE POINT & FORMULA	 (d) For any two mutually exclusive events A and B, the probability that either A or B occurs is given by the sum of individual probabilities of A and B i.e., P (A +B)
	P(A + B) = P(A) + P(B)
	(e) For any K(+ 2) mutually exclusive events A_1 , A_2 , A_3 ,
	A_K the probability that at least one of them occurs is given by the sum of the individual probabilities of the events i.e.,
	$P(A_1 + A_2 + + A_K) = P(A_1) + P(A_2) + P(A_K)$
	 (f) For any two events A and B, the probability that either A or B occurs is given by the sum of individual probabilities of A and B less the probability of simultaneous occurrence of the events A and B i.e., P (A +B) = P(A) + P(B) - P (A +B)
	(g) For any three events A, B and C, the probability that at least one of the events occurs is given by
	P (A + B + C) = P(A) + P(B) + P(C) - P(A + B) - P(A + C) - P(B + C) + P(A + B + C)
	 (h) For any two events A and B, the probability that A and B occur simultaneously is given by the product of the unconditional probability of A and the conditional probability of B given that A has already occurred i.e., P (A *B) = P(A)×P(B/A) Provided
	P(A) >0 (i) Compound Probability or Joint Probability
	$P(B/A) = \frac{P(B+A)}{P(A)} = \frac{P(A+B)}{P(A)}$
	P(A) P(A)

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GRAPHICAL FORMULA OF PROBABILITY

$P(A) = \frac{\text{number of favourable events}}{\text{number of total events}}$
$P(A) = \frac{n(A)}{n}$
$P(B) = \frac{n(B)}{n}$
$P(A \cap B) = P(A) P(B)$
for Mutually Exclusive Events
$P(A \cup B) = P(A) + P(B)$
for non-Mutual Events
$P(A \cup B) = P(A) + P(B) - P(A \cap B)$
for Conditional probability
$P(A \mid B) = \frac{P(A \cap B)}{P(B)}$



Ouestion 1

What is the chance of picking a spade or an ace not of spade from a pack of 52 cards? (b) $\frac{4}{14}$ (d) $\frac{6}{13}$

(a)	4
(a)	13
പ	15
U	13

Answer: a

Explanation:

A pack of 52 cards contain 13 spades, 13 Hearts, 13 Clubs and 13 Diamonds. Each of these groups of 13 cards has an ace. Hence the total number of elementary events is 52 out of which 13 + 3 or 16 are favorable to the event. A representing picking a space or an ace not of spade. This we have

$$P(A) = \frac{16}{52} = \frac{4}{13}$$

Ouestion 2

A committee of 7 members is to be formed form a group comprising 8 gentlemen and 5 ladies. What is the probability that the committee would comprise: 2 ladies.

(a) $\frac{140}{429}$	(b) $\frac{14}{429}$
$(c)\frac{10}{49}$	(d) None
Answer: a	
Explanation:	

Since there is altogether 8 + 5 or 13 persons, committee 7 members can be formed in 13_{C_7} Or $\frac{13!}{7!6!}$ or $\frac{13\times12\times11\times10\times9\times8!}{7!\times6\times5\times4\times3\times2\times1}$ or $11 \times 12 \times 13$ ways.

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When the committee is formed taking 2 ladies out of 5 ladies, the remaining (7-2) or 5 committee members are to be selected from 8 gentlemen. Now 2 out of 5 ladies can be selected in 5_{C_2} ways and 5 out of 8 gentlemen can be selected in 8_{C_5} ways. Thus if A denotes the event of having the committee with 2 ladies, then A can occur in $\mathbf{5}_{C_2}$ \times $8_{C_{r}}$ OR 10 × 56 Ways thus, $P(A) \frac{10 \times 56}{11 \times 12 \times 13} = \frac{140}{429}$ **Ouestion 3** What if in above questions 2. 2 ladies be replacing by at least 2 ladies? (b) $\frac{32}{29}$ (d) None (a) $\frac{92}{429}$ (c) $\frac{392}{429}$ Answer: c **Explanation**: Since the minimum number of ladies is 2, we can have the following combinations: **Population:** 8G 5L Sample 2L + **5**G 3L + 4G or 4L + 3G or 5L + 2Gor Thus if B denotes the event of having at least two ladies in the committee, then B can occur in $5_{C_2} \times 8_{C_5} + 5_{C_3} \times 8_{C_4} + 5_{C_4} \times 8_{C_3} + 5_{C_5} + 8_{C_2}$ i.e. 1568 ways. Hence P (A) = $\frac{1568}{11 \times 12 \times 13} = \frac{392}{429}$ **Ouestion 4** A bag contains 2 red, 3 green and 2 blue balls. Two balls are drawn at random. What is the probability that none of the balls drawn is blue? (a) $\frac{10}{21}$ (b) $\frac{11}{21}$ (d) $\frac{5}{7}$ (c) $\frac{2}{7}$ Answer: a **Explanation**: Total number of balls = (2 + 3 + 2) = 7. Let S be the sample space. Then, n(S) = Number of ways of drawing 2 balls out of 7 $=7_{C_2}$ $=\frac{(7\times 6)}{(2\times 1)}$ = 21.LET e = Event of drawing 2 balls, none of which is blue. \therefore n (E) = Number of ways of drawing 2 balls out of (2 + 3) balls. $= {}^{5}C_{2}$ $=\frac{(5\times4)}{(2\times1)}$ = 10. :. P (E) = $\frac{n(E)}{n(S)} = \frac{10}{21}$

Question 5

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In a box, there are 8 red, 7 blue and 6 green balls. One ball is picked up randomly. What is the probability that it is neither red nor green?

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(a) $\frac{1}{3}$	(b) $\frac{3}{4}$ (d) $\frac{8}{21}$
(a) $\frac{1}{3}$ (c) $\frac{7}{19}$	(d) $\frac{8}{21}$
Answer: a	
Explanation:	
Total number of balls = $(8 + 7 + 6) = 21$. event that the ball drawn is neither red or n	or greeen
event that the ball drawn is blue.	
∴n (E) = 7.	
:. P (E) = $\frac{n(E)}{n(S)} = \frac{7}{21} = \frac{1}{3}$	

Question 6

What is the probability of getting a sum 9 from two throws of a dice?

		<i>•</i>	0	0	
(a) $\frac{1}{6}$					(b) $\frac{1}{8}$
$(c)\frac{1}{9}$					(d) $\frac{1}{12}$
Answer:	С				

Explanation:

In two throws a dice $n(S) = (6 \times 6) = 36$. Let E = event of getting a sum = {(3, 6), (4, 5), (5, 4), (6, 3)} \therefore P (E) = $\frac{n(E)}{n(S)} = \frac{4}{36} = \frac{1}{9}$

Question 7

Three unbiased coins are tossed. What is the probability of getting at most two heads?

(a) $\frac{3}{4}$ (b) $\frac{1}{4}$ (c) $\frac{3}{8}$ (d) $\frac{7}{8}$ Answer: d Explanation: Here S = {TTT, TTH, THT, HTT, THH, HTH, HHT} Let E = event of getting at most heads. Then E = {TTT, TTH, THT, HTT, THH, HTH, HHT}. \therefore P (E) = $\frac{n(E)}{n(S)} = \frac{7}{8}$

Question 8

Two dice are thrown simultaneously. What is the probability of getting two numbers whose product is even?

(a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{3}{8}$ (d) $\frac{5}{16}$

Answer: b Explanation:

In a simultaneously throw of two dice. We have $n(S) = (6 \times 6) = 36$.

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Then E = {(1, 2), (1, 4), (1, 6), (2, 1), (2, 2), (2, 3), (2, 4), (2, 5), (2, 6), (3, 2), (3, 4), (3, 6), (4, 1), (4, 2), (4, 3), (4, 4), (4, 5), (4, 6), (5, 2), (5,, 4), (5, 6), (6, 1), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6)} \therefore n (E) = 27. \therefore p (E) = $\frac{n(E)}{n(S)} = \frac{27}{36} = \frac{3}{4}$

Question 9

In a class, there are 15 boys and 10 girls. Three students are selected at random. The probability that 1 girl and 2 boys are selected is:

(a) $\frac{21}{46}$		(b) $\frac{25}{117}$
$\left(a \right) \frac{1}{46}$		$(0)\frac{117}{117}$
1		2
$(c)\frac{1}{50}$		(d) $\frac{3}{25}$
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Answer: a Explanation:

Let S be the sample space and E be the event selecting 1 girl and 2 boys. Then, n (S) = Number Ways of selecting 3 student out of 25

$$= 25_{C_3}$$

= $\frac{(25 \times 24 \times 23)}{(3 \times 2 \times 1)}$
= 2300
n∈ = $(10_{C_1} \times 15_{C_2})$
= $\left[10 \times \frac{(15 \times 14)}{2 \times 1}\right]$
= 1050.
∴ P (E) = $\frac{n(E)}{n(S)} = \frac{1050}{2300} = \frac{21}{46}$

Question 10

In a lottery, there are 10 prizes and 25 blanks. A lottery is drawn at random. What is the probability of getting a prize?

(a) $\frac{1}{10}$	(b) $\frac{2}{5}$
2	(d) $\frac{5}{7}$
Answer: c	,
Explanation:	
P (getting a prize) = $\frac{10}{(10+26)} = \frac{10}{35} = \frac{2}{7}$	

Question 11

From a pack of 52 cards, two cards are drawn together at random. What is the probability of both the cards being kings?

(a) $\frac{1}{15}$ (b) $\frac{25}{57}$ (c) $\frac{1}{221}$ (d) $\frac{35}{256}$ Answer: c Explanation: Let S be the sample space. Then, n(S) = ${}^{52}c_2 = \frac{(52 \times 51)}{(2 \times 1)} = 1326$. Let E = event of getting 2 kings out of 4.

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 \therefore n (E) = ${}^{4}C_{2} = \frac{(4 \times 3)}{(2 \times 1)} = 6.$:. P(E) = $\frac{n(E)}{n(S)} = \frac{6}{1326} = \frac{1}{221}$

Question 12

Two dice are tossed. The probability that the total score is a prime number is: (b) $\frac{5}{\frac{12}{12}}$ (d) $\frac{7}{9}$

(a) $\frac{1}{2}$ $(c)\frac{1}{2}$

Answer: b

Explanation: Clearly, $n(S) = (6 \times 6) = 36$. Let E = Event that the sum is a prime number. Then $E = \{(1, 1), (1, 2), (1, 4), (1, 6), (2, 1), (2, 3), (2, 5), (3, 2), (3, 4), (4, 1), (4, 3), (5, 2), (3, 4), (4, 1), (4, 3), (5, 2), (4, 3), (5, 2), (4, 3), (5$ (5, 6), (6, 1), (6, 5)∴n (E) = 15. $\therefore P(E) = \frac{n(E)}{n(S)} = \frac{15}{36} = \frac{5}{12}$

<u>Question 13</u>

A card is drawn from a pack of 52 cards. The probability of getting a queen of club or a king of heart is:

(a) $\frac{1}{\frac{13}{13}}$ (c) $\frac{1}{\frac{1}{26}}$ (b) $\frac{2}{13}$ (d) $\frac{1}{52}$ Answer: c **Explanation**: Here, n(S) = 52. Let E = event of getting a queen of club or a king of heart. Then, n(E) = 2. :. P (E) = $\frac{n(E)}{n(S)} = \frac{2}{52} = \frac{1}{26}$

Ouestion 14

Two cards are drawn together from a pack of 52 cards. The probability that one is a spade and one is a heart, is:

$(a)\frac{3}{20}$	(b) $\frac{29}{34}$
(a) $\frac{3}{20}$ (c) $\frac{47}{100}$	(b) $\frac{29}{34}$ (d) $\frac{13}{102}$
Answer: d	
Explanation:	
Let S be the sample space.	
Then, $n(S) = {}^{52}C_2 = \frac{(52 \times 51)}{(2 \times 1)} = 1326.$	
Let E = event of getting 1 spade and 1 heart.	
\therefore N (E) = number of ways of choosing 1 space	de out of 13 and 1 heart out of 13
$= (^{13}C_1 \times ^{13}C_1)$	
= (13 × 13)	
= 169.	
:. P (E) = $\frac{n(E)}{n(S)} = \frac{169}{1326} = \frac{13}{102}$	

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Question 15

One card is drawn at random from a pack of 52 cards. What is the probability that the card drawn is a face card (jack, Queen, and King only)?

(a) $\frac{1}{13}$ (b) $\frac{3}{13}$ (c) $\frac{1}{4}$ (d) $\frac{9}{52}$ Answer: b Explanation: Clearly, there are 52 cards out of which there are 12 face cards. \therefore P (getting a face card) = $\frac{15}{52} = \frac{3}{13}$

Question 16

A bag contains 6 black and 8 white balls; one ball is drawn at random. What is the probability that the ball drawn is white?

(a) $\frac{3}{4}$	(b) $\frac{4}{7}$
$(c)\frac{1}{8}$	(d) $\frac{3}{7}$
Answer: b	
Explanation:	
Let number of balls = $(6 + 8) = 14$.	
Number of white balls = 8.	

P (drawing a white ball) = $\frac{8}{14} = \frac{4}{7}$

Question 17

A bag contains 6 white and 4 black balls, 2 balls are drawn at random. Find the probability that they are of same colour.

(a) $\frac{1}{2}$	(b) $\frac{7}{15}$ (d) $\frac{1}{9}$	
(a) $\frac{1}{2}$ (c) $\frac{8}{15}$	$(d)\frac{1}{9}$	
Answer: b		
Explanation:		
Let S be the Sample space		
Then n(S) = no of ways drawing 2 balls out of	(6+4)	
$= {}^{10}C_2 = 45$		
Let E = event of getting both balls of same colour		
Then, n (E) = no of ways (2 balls out of six) or (2 balls out of 4)		
$= {}^{6}C_{2} + {}^{4}C_{2}$		
= 15+6 = 21		
Therefore, P (E) = $\frac{n(E)}{n(S)} = \frac{21}{45} = \frac{7}{15}$		
Question 18		
A problem is given to three students whose	e chance of solving is are $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$	

respectively what is the probability that the problem will be solved?

(a) $\frac{1}{4}$	•	(b) $\frac{1}{2}$	
(c) $\frac{3}{4}$		$(d)\frac{2}{1}$	2
Answer: c		1	

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Explanation:

Let A, B, C be the respective events solving the problem and \overline{A} , \overline{B} , \overline{C} be the respective events of not solving the problem. Then A, B, C are independent event $\therefore \overline{A}, \overline{B}, \overline{C}$ are independents events Now P (A) $=\frac{1}{2}$, P (B) $=\frac{1}{3}$ and P(C) $=\frac{1}{4}$ $P(\overline{A}) = \frac{1}{2}, P(\overline{B}) = \frac{2}{3}, P(\overline{C}) = \frac{3}{4}$ \therefore P (none solves the problem) = P (not A) and (not B) and (not C) $= P(\overline{A} \cap \overline{B} \cap \overline{C})$ = P (\overline{A}) P (\overline{B}) P (\overline{C}) [:: \overline{A} , \overline{B} , \overline{C} are Independent] $=\frac{1}{2} \times \frac{2}{3} \times \frac{3}{4}$ $=\frac{1}{4}$ Hence, P (the problem will be solved) = 1 - P (none solves the problem) $= 1 - \frac{1}{4} = \frac{3}{4}$

Question 19

Two cards are drawn at random from a pack of 52 cards what is the probability that either both are black or both are queen?

(b) $\frac{55}{190}$ (d) $\frac{19}{221}$ (a) $\frac{52}{221}$ (c) $\frac{55}{221}$ **Answer: c Explanation**: We have $n(s) = {}^{52}C_2 = \frac{52 \times 51}{2 \times 1} = 1326$. Let A = event of getting both black cards B = event of getting both queens $A \cap B =$ event of getting queen of black cards n (A) = $\frac{52 \times 51}{2 \times 1}$ = ${}^{26}C_2$ = 325. n (B) = $\frac{26 \times 25}{2 \times 1}$ = $\frac{4 \times 3}{2 \times 1}$ = 6 and $n(A\cap B) = {}^{4}C_{2} = 1$ $P(A) = \frac{n(A)}{n(S)} = \frac{325}{1326};$ P (B) = $\frac{n(B)}{n(s)} = \frac{6}{1326}$ and $P(A \cap B) = \frac{n(A \cap B)}{n(S)} = \frac{1}{1326}$ $P(AUB) = P(A) + P(B) - P(AB) = \frac{(325+6-1)}{1326} = \frac{330}{1326} = \frac{55}{221}$

Ouestion 20

Tickets numbered 1 to 20 are mixed up and then a ticket is drawn at random. What is the probability that the ticket drawn has a number which is a multiple of 3 or 5? (b) $\frac{3}{5}$ (d) $\frac{8}{15}$

(a) $\frac{1}{2}$		
(c) $\frac{9}{20}$		
Answer: c		
Explanation:		

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Here, S = {1, 2, 3, 4... 19, 20} Let E = event of getting multiple of 3 or 5 = {3, 6, 9, 12, 15, 18, 5, 10, 20}. P (E) $=\frac{n(E)}{n(s)} = \frac{9}{20}$.

Question 21

Two dice are tossed. The probability that the total score is a prime number is: (a) $\frac{5}{12}$ (b) $\frac{1}{6}$ (c) $\frac{1}{2}$ (d) $\frac{7}{9}$ Answer: a Explanation: Clearly, n(S) = (6×6) = 36. Let E = Event that the sum is a prime number. Then E = {(1, 1), (1, 2), (1, 4), (1, 6), (2, 1), (2, 3), (2, 5), (3, 2), (3, 4), (4, 1), (4, 3), (5, 2), (5, 6), (6, 1), (6, 5)} n (E) = 15. P (E) = $\frac{n(E)}{n(S)} = \frac{15}{36} = \frac{5}{12}$

Question 22

A man and his wife appear in an interview for two vacancies in the same post. The probability of husband's selection is $\left(\frac{1}{7}\right)$ and the probability of wife's selection is

 $\left(\frac{1}{5}\right)$. What is the probability that only one of them is selected?

(a) $\frac{2}{7}$	(b) $\frac{1}{7}$
(c) $\frac{3}{4}$	(d) $\frac{4}{5}$
4	5

Answer: a

Explanation: Let A = Event that the husband the selected And B = Event that the wife is selected Then, P (A) = $\frac{1}{7}$ and P (B) = $\frac{1}{5}$ \therefore P (\overline{A}) = $\left(1 - \frac{1}{7}\right) = \frac{6}{7}$ and P (\overline{B}) = $\left(1 - \frac{4}{5}\right) = \frac{4}{5}$ \therefore Required probability = P [(A and not B) or (B and not A)] = p [(A and \overline{B}) or (B and $\overline{A})]$ = p [(A and \overline{B}) + P (B and $\overline{A})]$ = P (A)-P(\overline{B})+P (B)-P(\overline{A}) = $\left(\frac{1}{7} \times \frac{4}{5}\right) + \left(\frac{1}{5} \times \frac{6}{7}\right) = \frac{10}{35} = \frac{2}{7}$

Question 23

A bag contains 4 white, 5 red and 6 blue balls, three balls are drawn at random from the bag. The probability that all of them are red is:

(a) $\frac{2}{91}$	(b) $\frac{1}{22}$
(c) $\frac{3}{22}$	(d) $\frac{2}{77}$
Answer: a	
Explanation:	
Let S be the sample space.	
Then, n(S) = number of ways of drawing	3 balls out of 15

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= $15C_3 = \frac{15 \times 14 \times 13}{3 \times 2 \times 1} = 455$. Let E = event of getting all the 3 red balls. n (E) = $5C_3 = \frac{5 \times 4}{2 \times 1} = 10$. => P (E) = $\frac{n(E)}{n(s)} = \frac{10}{455} = \frac{2}{91}$

Question 24

In a lottery, there are 10 prizes and 25 blanks; a lottery is drawn at random. What is the probability of getting a prize?

(a) $\frac{2}{7}$ (b) $\frac{1}{5}$ (c) $\frac{1}{5}$ (d) $\frac{1}{2}$ Answer: a Explanation:

Total number of outcomes possible, n(S) = 10 + 25 = 35P (E) = n(E)/n(S) = 10/35 = 2/7

Question 25

In a class, there are 15 boys and 10 girls. Three students are selected at random. The probability that 1 girl and 2 boys are selected is:

(a) $\frac{21}{46}$ (b) $\frac{1}{5}$ (d) $\frac{1}{50}$ (c) $\frac{3}{25}$ Answer: a **Explanation**: Let, S – sample space E – event of selecting 1 girl and 2 boys. Then, n(S) = Number ways of selecting 3 students out of 25 $= {}^{25}C_3 = 2300.$ n (E) = 10C1×15C2= 1050. \therefore P(E) = $\frac{n(E)}{n(S)} = \frac{1050}{2300} = \frac{21}{46}$ **Ouestion 26** What is the probability of getting 53 Mondays in a leap year? (b) $\frac{3}{7}$ (a) $\frac{1}{7}$ (c) $\frac{2}{7}$ (d) None of these Answer: c **Explanation**: 1 year = 365 days. A leap year has 366 days A year has 52 weeks. Hence there will be 52 Sundays for sure. 52 weeks = 52×7 = 364days 366 - 364 = 2 days In a leap year there will be 52 Sundays and 2 days will be left. These 2 days can be: 1. Sunday, Monday 2. Monday, Tuesday

3. Tuesday, Wednesday

4. Wednesday, Thursday

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5. Thursday, Friday 6. Friday, Saturday 7. Saturday, Sunday Of these total 7 outcomes, the favorable outcomes are 2. Hence the probability of getting 53 days = $\frac{2}{\pi}$

Question 27

Two dice are thrown together. What is the probability that the sum of the number on the two faces is divided by 4 or 6?

(a) $\frac{7}{18}$	(b) $\frac{14}{35}$
(c) $\frac{8}{18}$	(d) $\frac{7}{35}$

Answer: a

Explanation: Clearly, $n(S) = 6 \times 6 = 36$

Let E be the event that the sum of the b=numbers on the two faces is divided by 4 or 6, Then, E = {(1, 3), (1, 5), (2, 2), (2, 4), (2, 6), (3, 1), (3, 3), (3, 5), (4, 2), (4, 4), (5,, 1), (5, 3), (6,, 2), (6, 6)} n (E) = 14. Hence, P (E) = $\frac{n(E)}{n(S)} = \frac{14}{36} = \frac{7}{18}$

Question 28

One card is drawn at random from pack of 52 cards. What is the probability that the card drawn is face card (Jack, Queen and king only)?

(a) $\frac{3}{13}$ (b) $\frac{1}{13}$ (c) $\frac{3}{52}$ (d) $\frac{9}{52}$ Answer: a Explanation:

Clearly, there are 52 cards, out of which there are 12 face cards. P (getting a face card) = $\frac{12}{52} = \frac{3}{13}$.

Question 29

Two cards are drawn together from a pack of 52 cards. The probability that one is a spade and one is a heart, is:

(a) $\frac{3}{20}$	(b) $\frac{29}{34}$	
(a) $\frac{3}{20}$ (c) $\frac{47}{100}$	(b) $\frac{29}{34}$ (d) $\frac{13}{102}$	
Answer: d	102	
Explanation:		
Let S be the sample space.		
Then, n(S) = $52C252C2 = \frac{(52 \times 51)}{(2 \times 1)} = 132$	26	
Let E = event of getting 1 spade and 1	heart.	
n (E) = number of ways of choosing 1 spade out of 13 and 1 heart out of 13		
= 13C1×13C113C1×13C1 = 169.		
$P(E) = \frac{n(E)}{n(S)} = \frac{169}{1326} = \frac{13}{102}$		

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Question 30

A bag contains 6 black and 8 white balls; one ball is drawn at random. What is the probability that the ball drawn is white?

(a) $\frac{3}{7}$ (b) $\frac{4}{7}$ (c) $\frac{1}{8}$ (d) $\frac{3}{4}$ Answer: b Explanation: Let number of balls = (6+8) = 14. Number of white balls = 8 P (drawing a white ball) = $\frac{8}{14} = \frac{4}{7}$.

Question 31

In a class 30% of the students offered English, 20% offered Hindi and 10% offered both. If a student is selected at random. What is the probability that he, has offered English or Hindi?

(a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{4}{5}$ (d) $\frac{2}{5}$ Answer: d Explanation: P (E) $= \frac{30}{100} = \frac{3}{10}$, P (H) $= \frac{20}{100} = \frac{1}{5}$ and P (E \cap H) $= \frac{10}{100} = \frac{1}{10}$ P (E OR H) = P (E U H) = P (E) + P (H) - P (E \cap H) $= \left(\frac{3}{10} + \frac{1}{5} - \frac{1}{10}\right) = \frac{4}{10} = \frac{2}{5}$

Question 32

If two letters are taken at random from the word HOME. What is the probability that none of the letters would be vowels?

(a) $\frac{1}{6}$	(b) $\frac{1}{2}$
(c) $\frac{1}{3}$	(d) $\frac{1}{4}$

Answer: a Explanation:

P (first letter is not vowel) = 2/4P (second letter is not vowel) = 1/3So, probability that none of the letters would be vowels is = 2/4*1/3 = 1/6

Question 33

Two cards are drawn at random from a pack of 52 cards. The probability that both are the cards of space is

(a) $\frac{1}{26}$ (b) $\frac{1}{4}$ (c) $\frac{1}{17}$ (d) None of these Answer: c Explanation: Required probability $= \frac{13_{c_2}}{52_{c_2}} = \frac{13.12}{52.51} = \frac{1}{17}$

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Question 33

5 boys and 5 girls are sitting in a row randomly. The probability that boys and girls sit alternatively is:

(a) $\frac{5}{126}$ (c) $\frac{4}{126}$	(b) $\frac{1}{126}$	
$(c)\frac{4}{126}$	(d) $\frac{\frac{120}{6}}{125}$	
Answer: b		
Explanation:		
Let n = total no. of ways = 10!		
m = favorable no. of ways = $2 \times 5!$.5!		
Since the boys and girls can sit alternately in 5!.5! Ways if began with a boy and		
similarly they can sit alternately in 5!.5! Ways if we begin with a girl		
Hence, required probability = $\frac{m}{n} = \frac{2 \times 5!5!}{10!} = \frac{1}{10!}$	$\frac{2\times5!}{\times9\times8\times7\times6} = \frac{1}{126}$	

Question 34

Fifteen persons among whom are A and B, sit down at random at a round table. The probability that there are 4 persons between A and B, is

(a) $\frac{1}{3}$	(b) $\frac{2}{3}$
(c) $\frac{2}{7}$	(d) $\frac{1}{7}$

Answer: d

Explanation:

Let A occupy any seat at the round table. Then there are 14 seats available for B. If there are to be four persons between A and B

Then B has only two ways to sit, as show in the fig. hence required probability $\frac{2}{14} = \frac{1}{7}$

Question 35

From eighty cards numbered 1 to 80, two cards are selected randomly. The probability that both the cards have the numbers divisible by 4 is given by

(a) $\frac{21}{316}$	(b) $\frac{19}{316}$
(c) $\frac{1}{4}$	(d) None
Answer: b	
Explanation:	
Total numbers of ways = 80_{c}	and favorable ways = 20_{c}

Total numbers of ways = 80_{c_2} and favorable ways = 20_{c_2} Required probability P = $\frac{80_{c_2}}{20_{c_2}} = \frac{19}{316}$

Question 36

A bag contains 8 red and 7 black balls. Two balls are drawn at random. The probability that both the balls are of the same colour is

(a) $\frac{14}{15}$			(b) $\frac{11}{15}$
(c) $\frac{7}{15}$			(d) $\frac{4}{15}$
Answer: c			
Explanation:			
	1.1.1	 1 11	1

Required probability = either thee balls are red or the balls are black

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 $\frac{\frac{8_{c_2}}{15_{c_2}} + \frac{7_{c_2}}{15_{c_2}} = \frac{28 + 21}{105}}{\frac{49}{105}} = \frac{7}{15}$

Question 37

5 persons A, B, C, D and E are in queue of a shop. The probability that A and E always together, is:

(a) $\frac{1}{4}$	(b) $\frac{2}{3}$
(c) $\frac{2}{5}$	(d) $\frac{3}{5}$

Answer: c

Explanation: Total number of ways = 5! Favorable number of ways 2.4! Hence required probability

 $\frac{2.4!}{5!} = \frac{2}{5}$

Question 38

A drawer contains 5 brown socks and 4 blue socks well mixed. A man reaches the drawer pulls out 2 socks at random. What is the probability that they match?

(a) $\frac{4}{9}$	(b) $\frac{5}{8}$
(c) $\frac{5}{9}$	(d) $\frac{7}{12}$

Answer: a

Explanation:

Out of 9 socks, 2 can be drawn in 9_{c_2} ways.

Two socks drawn from the drawer will match if either both are brown of both are blue. $5_{c_2} + 4_{c_2}$

Hence the required probability = $\frac{5_{c_2} + 4_{c_2}}{9_{c_2}} = \frac{4}{9}$

Question 39

Ten students are seated at random is a row. The probability that two particular students are not seated side by side is

(a) $\frac{4}{5}$ (b) $\frac{3}{5}$ (c) $\frac{2}{5}$ (d) $\frac{1}{5}$ Answer: a Explanation: Total ways = 10! Two boys can sit by side in 2 × 9! Ways. So probability = $\frac{2 \times 9!}{10!} = \frac{1}{5}$ Thus the probability that they are not seated together is $1 - \frac{1}{r} = \frac{4}{r}$

Question 40

A fair coin is tossed 100 times. The probability of getting tails and odd number of times is

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(a) $\frac{1}{2}$ (b) $\frac{1}{8}$ (c) $\frac{3}{8}$ (d) None Answer: a Explanation: The total numbers of cases are 2^{100} The number of favorable ways $100c_1 + 100c_3 + ... + 100c_{99} = 2^{100} - 1 = 2^{99}$ $= \frac{2^{99}}{2^{100}} = \frac{1}{2}$

Question 41

Three cards are drawn at random from a pack of 52 cards. What is the chance of drawing three aces?

(a) $\frac{3}{5525}$ (b) $\frac{2}{5525}$ (c) $\frac{1}{5525}$ (d) None **Answer: c Explanation:** Required probability is $\frac{4c_3}{52c_3} = \frac{1}{5525}$

Question 42

A bag contains 4 white, 5 red and 6 green balls. Three balls are picked up randomly. The probability that a white, a red and a green ball is drawn is

(a) $\frac{15}{91}$ (b) $\frac{30}{31}$ (c) $\frac{20}{91}$ (d) $\frac{24}{91}$ Answer: d Explanation: Required probability = $\frac{4.5.6}{15_{c_3}} = \frac{24}{91}$

Question 43

Two numbers are selected randomly from the set S = {1, 2, 3, 4, 5, 6} without replacement one by one. The probability that minimum of the two numbers is less than 4 is

(a) $\frac{1}{15}$ (b) $\frac{14}{15}$ (c) $\frac{1}{5}$ (d) $\frac{4}{5}$ Answer: d Explanation: Total ways = 2! $6_{c_3} = 30$ Favorable cases = 30-6 = 24Required probability = $\frac{24}{30} = \frac{4}{5}$ Question 44

A bag contains 5 black balls, 4 white balls and 3 red balls. If a ball is selected random wise, the probability that it is a black or red ball is (a) $\frac{1}{2}$ (b) $\frac{1}{4}$

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(c) $\frac{5}{12}$ Answer: d Explanation: P (Black or Red) = $\frac{5_{c_1+3_{c_1}}}{12_{c_1}} = \frac{2}{3}$

Question 45

In a lottery there were 90 tickets numbered 1 to 90. Five tickets were drawn at random. The probability that two of the tickets drawn numbers 15 and 89 is (a) $\frac{2}{801}$ (b) $\frac{2}{623}$ (c) $\frac{1}{267}$ (d) $\frac{1}{623}$

 $(d)\frac{2}{2}$

(a) $\frac{2}{801}$ (c) $\frac{1}{267}$ Answer: a Explanation: Required probability $=\frac{88_{c_3}}{90_{c_5}}=\frac{2}{801}$

Question 46

A bag contains 3 red, 4 white, and 5 black balls. Three balls are drawn at random. The probability of being their different colors is

(a) $\frac{3}{11}$	(b) $\frac{2}{1}$
11	¢ 11
$(c)\frac{8}{11}$	(d) None
Answer: a	

Evolution

Explanation:

Total number of balls in a bag are 3 + 4 + 5 = 12

Three balls drawn at random is 12_{C_3}

When the all three ball are drawn different $3_{C_1} \times 4_{C_1} \times 5_{C_1}$

Now probability that three ball drawn from bag random and different colors

is
$$\frac{3_{C_1} \times 4_{C_1} \times 5_{C_1}}{12_{C_3}} = \frac{\left(\frac{3!}{1! \times 2!} \times \frac{4!}{1! \times 3!} \times \frac{5!}{1! \times 4!}\right)}{\frac{12!}{9! \times 3!}}$$
$$= \frac{3 \times 4 \times 5 \times 6}{12 \times 11 \times 10}$$
$$= \frac{3}{11}$$

Therefore, the probability that the three balls drawn from bag of being their different colors is $\frac{3}{11}$

Thus correct answer is option (A)

Question 47

Dialing a telephone number an old man forgets the last two digits remembering only that these are different dialed at random. The probability that the number is dialed correctly, is

(a) $\frac{1}{45}$ (b) $\frac{1}{90}$ (c) $\frac{1}{100}$ (d) $\frac{1}{80}$ Answer: b Explanation: There are 10 digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

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The last two digits can be dialed in 10_{P_2} = 9	0 ways.	
Out of which only one way is favorable. Thu		<u>1</u> 00
<u>Question 48</u> Two friends A and B have equal number tickets which are to be distributed amor probability that all the tickets go to daug	ng the daughters of A and B.	The
daughters each of them have is	20	
(a) 4	(b) 5	
(c) 6	(d)3	
Answer: d		
Explanation:		
Let A and B each have x daughters	xca	
\therefore Probability that all tickets go to all daugh	ter of A = $\frac{a_3}{2x_{C_3}}$	
$=\frac{x(x-1)(x-2)}{2x(2x-1)(2x-2)}=\frac{1}{20}$	-	
2x(2x-1)(2x-2) 20		
→ $\frac{x-2}{4(2x-1)} = \frac{1}{20}$ → 20x - 40 = 8x - 4		
$\Rightarrow 12x = 36 \Rightarrow x = 3$		
Number of daughters each have = 3		
<u>Question 49</u> From a class of 12 girls and 18 boys, two the probability that both of them are gir		mly. What is
(a) $\frac{22}{145}$	(b) $\frac{13}{15}$	
$(C)\frac{1}{8}$	(d) none	
0		
Answer: a Explanation:		
Required probability = $\frac{12_{c_2}}{30_{c_2}} = \frac{12 \times 11}{30 \times 29} = \frac{22}{145}$		
<u>Question 50</u> Twenty tickets are marked the numbers		
random, then what is the probability tha		e among them.
(a) $\frac{3}{190}$	(b) $\frac{1}{19}$	
$(c)\frac{1}{190}$	(d) None	
Answer: a		
Explanation:		
7 and 11 have always 10 be in that group o	f three, therefore 3 rd ticket ma	ay be chosen in
18 ways.		-

18 ways. Hence required probability is $\frac{18}{20_{c_3}} = \frac{18.3.2}{20.19.18} = \frac{3}{190}$

Question 51

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The letter of the word 'ASSASSIN' are written down at random in arrow. The probability that no two S occur together is

(a) $\frac{1}{35}$ (b) $\frac{1}{14}$ (c) $\frac{1}{15}$ (d) None Answer: b Explanation: Total ways of arrangements $= \frac{8!}{2!.4!}$ w·x·y·z Now S can have places at dot's and in places of w, x, y, z We have to put 2A's, one I and one N. Therefore favorable ways $= 5\left(\frac{4!}{2!}\right)$ Hence required probability $= \frac{5.4!2!4!}{21.8!}$ $= \frac{1}{14}$

Question 52

A and B are two independent events such that P (A) = $\frac{1}{2}$ and P (B) = $\frac{1}{3}$. Then P (neither A nor B) is equal to

(a) $\frac{2}{3}$ (b) $\frac{1}{6}$ (c) $\frac{5}{6}$ (d) $\frac{1}{3}$ Answer: d Explanation: P (neither A nor B) = P ($\bar{A} \cap \bar{B}$) = P (\bar{A}).P (\bar{B}) = P(\bar{A}) = 1-P (A) = $1 - \frac{1}{2} = \frac{1}{2}$ = P (\bar{B}) = 1-P(\bar{B}) = $1 - \frac{1}{3} = \frac{2}{3}$ \therefore P(\bar{A}).P(\bar{B}) = $\frac{1}{2} \times \frac{2}{3} = \frac{1}{3}$

Question 53

In a throw of a dice the probability of getting one in even number of throw is (a) $\frac{5}{36}$ (b) $\frac{5}{11}$ (c) $\frac{6}{11}$ (d) $\frac{1}{6}$ Answer: b Explanation: Probability of getting 1 on 2nd throw, P (2) $\left(\frac{5}{6}\right)\left(\frac{1}{6}\right)$ Probability of getting 1 on 4th throw, P (4) $\left(\frac{5}{6}\right)^3\left(\frac{1}{6}\right)$ Probability of getting 1 on 6th throw, P (6) $\left(\frac{5}{6}\right)^5\left(\frac{1}{6}\right)$ Therefore total probability P = P (2) + P (4) + P (6) + P = $\left(\frac{5}{6}\right)\left(\frac{1}{6}\right) + \left(\frac{5}{6}\right)^3\left(\frac{1}{6}\right) + \left(\frac{5}{6}\right)^5\left(\frac{1}{6}\right) +$

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$P = \frac{1}{6} \left[\left(\frac{5}{6} \right) + \left(\frac{5}{6} \right)^3 + \left(\frac{5}{6} \right)^5 + \cdots \right]$
By sum of an infinite geometric series,
$P = \frac{1}{6} \left[\frac{\frac{1}{6}}{(\pi)^2} \right]$

 $6\left\lfloor 1-\left(\frac{5}{2}\right)^2\right\rfloor$ $P = \frac{5}{11}$

PAST EXAMINATION QUESTIONS:

<u>MAY 2018</u>

Question 1

Two broad divisions of probability are:

(a) Subjective probability and objective probability

(c) Statistical probability and mathematical probability

Answer: a

Explanation: Two broad and divisions of probability are A. Subjective probability B. Objective probability

Question 2

The term "chance" and probability is synonyms:(a) True(b) False(c) Both(d) None

Answer: a

Explanation:

The terms "chance" and probability are synonyms is True.

Question 3

The theorem of compound probability states that for any two A and B

(a) P (A \cap B) = P (A) X P $\left(\frac{B}{A}\right)$ (c) P (A \cap B) = P (A) x P (B) (b) P (A U B) = P (A) X P $\left(\frac{B}{A}\right)$ (d) P (A U B) = P (A) + P (B) – P (A \cap B)

Answer: a

Explanation: The theorem of compound probability states that for only events A and B given by

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(b) Deductive probability and mathematical probability(d) None

d

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$P(A \cap B) = P(A) \times P\left(\frac{B}{A}\right)$

Ouestion 4

Variance of a random variable x is given by

(a) E $(X-\mu)^2$ (b) $E[X-E(X)]^2$ (d) (a) or (b) (c) E ($X^{2}-\mu$)

Answer: d

Explanation:

Variance of a random variable x is given by $V(x) = E(x-\mu)^2$

Or

 $V(x) = [E(X-E(x))]^{2}$

Ouestion 5

What is the probability of having at least one' six' year's throws of a project die? (b) $\left(\frac{5}{6}\right)^3$ (d) $1 - \left(\frac{5}{6}\right)^3$ (a) $\frac{5}{6}$

(c)	1-1	$\left(\frac{1}{2}\right)$	1
U	T -	$\left(6 \right)$	

Answer: d

Explanation:

```
For a die probability of getting six
```

```
P(A) = \frac{1}{6} \rightarrow p
P(\bar{A}) = 1 - \frac{1}{6} = \frac{5}{6} \rightarrow q
 Here n = 3
 P(getting at least '1' six) = P (X\geq1)
 = 1 - P(X < 1)
= 1 - P(X=0)
= 1 - 3_{C_0} \cdot \left[\frac{1}{6}\right]^0 \cdot \left(\frac{1}{6}\right)^{3-0}= 1 - 1 \times 1 \times \left[\frac{5}{6}\right]^3
= 1 - \left[\frac{5}{5}\right]^3
```

Question 6

Sum of all probabilities mutually exclusive and exhaustive events is equal to (a) 0 $(1)^{1}$

(a) 0	$(D) = \frac{1}{2}$
(c) $\frac{1}{4}$	(d) 1
Answer: d	

Explanation:

Sum of all probabilities mutually exclusive and exhaustive events is equal to 1

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<u>NOV 2018</u>

Question 1	
If P (A) = $\frac{1}{2}$, P (B) = $\frac{1}{3}$, and P (A \cap B) =	$\frac{1}{4}$, then P (A U B) is equal to
(a) $\frac{11}{12}$	(b) $\frac{10}{12}$
$(c) \frac{12}{12}$	$(d) \frac{1}{6}$
Answer: c	(a) ₆
Explanation:	
P (A) = $\frac{1}{2}$, P (B) = $\frac{1}{2}$, and P (A \cap B) = $\frac{1}{4}$	
We know that	
$P(A \cup B) = P(A) + P(B) - P(A \cap B)$	
1	$+\frac{1}{3}-\frac{1}{4}$
	$+\frac{1}{3}-\frac{1}{4}$
$\frac{6+4-3}{12} = \frac{7}{12}$	
Question 2 The surplus hiliter that a lease surplus for 5	
The probability that a leap year has 5	
(a) $\frac{2}{7}$	(b) $\frac{3}{5}$ (d) $\frac{1}{7}$
(c) $\frac{2}{3}$	(d) $\frac{1}{7}$
Answer: a	
Explanation:	
In a leap year, there are 366 days.	
366 days = 52 weeks and 2 days. 2 odd days may be:	
(a) Sunday and Monday	
(b) Monday and Tuesday	No. of sample space
(c) Tuesday and Wednesday n(S	
	Event (A) = 'getting Wednesday'
(e) Thursday and Friday n (A) = 2	
(f) Friday and Saturday $P(A) = \frac{2}{7}$	
(g) Saturday and Sunday	
Question 2	

Question 3

A coin is tossed six times, then the probability of obtaining heads and tails alternatively is

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(b) $\frac{1}{64}$
1
(d) $\frac{1}{16}$

(a) $\frac{1}{2}$ (c) $\frac{1}{32}$ Answer: c

Explanation: If one coin is tossed '6' times $P(H) = \frac{1}{2}, P(T) = \frac{1}{2}$ P (Alternate getting 'H' & 'T') = P (HT HT HT) + P (TH TH TH) $\frac{1}{2} \times \frac{1}{2} \times \frac$ $\frac{1}{64} + \frac{1}{64} = \frac{1}{64} = \frac{1}{32}$

Question 4

Ram is known to hit a target in 2 out of 3 shots whereas Shyam is known to hit the same target in 5 out of 11 shots. What is the probability that the target would be hit if they both try?

would be lift if they both try:
(a) $\frac{9}{11}$ (b) $\frac{3}{11}$
$(c)\frac{10}{11}$ $(d)\frac{16}{11}$
Answer: a
Explanation:
Probability of hitting the target by Ram P (A) = $\frac{2}{3}$
Probability of hitting the target by Shyam P (B) $\frac{5}{11}$
$P(\bar{A}) = 1 - \frac{2}{3} = \frac{1}{3}$ $P(\bar{B}) = 1 - \frac{5}{11} = \frac{6}{11}$
$P(\bar{B}) = 1 - \frac{5}{11} = \frac{6}{11}$
P (Target WOULT be HIT) = 1-P ($\overline{A} \cap \overline{B}$)
1- $P(\overline{A})$. $P(\overline{B})$
$1 - \frac{1}{3} \times \frac{6}{11} = 1 - \frac{2}{11} = \frac{9}{11}$
$=1-\frac{2}{2}=\frac{9}{2}$
11 11
Question 5
Two different dice are thrown simultaneously, then the probability, that the
sum of two numbers appearing on the top of dice is 9 is
(a) $\frac{8}{9}$ (b) $\frac{1}{9}$
(a) $\frac{8}{9}$ (b) $\frac{1}{9}$ (c) $\frac{7}{9}$ (d) None
Answer: b
Explanation:
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If two dice are rolled then Sample space $n(s) = 6^2 = 36$ Event (A) = Getting the sum is '9' $= \{(6, 3) (3, 6)(4, 5) (5, 4)\}$ n(A) = 4P (A) = $\frac{n(A)}{n(S)} = \frac{4}{36} = \frac{1}{9}$ **Question 6** If P (A U B) = 0.8 and P (A \cap B) = 0.3, then P(\overline{A}) + P (\overline{B}) is equal to (b) 0.5 (a) 0.3 (c) 0.7 (d) 0.9 Answer: d **Explanation:** Given $P(A U B) = 0.8 \text{ and } P(A \cap B) = 0.3$ We know that $P(A U B) = P(A) + P(B) - P(A \cap B)$ $0.8 = [1 - P(\overline{A})] + [1 - P(\overline{B}) - 0.3]$ $P(\bar{A}) + P(\bar{B}) = 2 - 0.3 - 0.8$ $P(\overline{A}) + P(\overline{B}) = 0.9$

MAY 2019

Question 1

If a coin is tossed 5 times, then the probability of getting Tail and Head occurs alternatively is:

(a) $\frac{1}{18}$ (b) $\frac{1}{16}$ (c) $\frac{1}{32}$ (d) $\frac{1}{64}$ Answer: c Explanation: $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{32}$ Question 2 According to bayee's theorem, P (E_KIA) = $\frac{P(E_K)P(\frac{A}{E_K})}{\sum_{i=1}^{n} P(E_i)P(\frac{A}{E_i})}$ here (a) E₁, E₂are mutually exclusive (b) $P(\frac{E}{A})$, $P(\frac{E}{A_2})$ are equal to 1

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(c) $P(\frac{A_t}{E})$, $P(\frac{A_2}{E})$	Are equal to 1
---	----------------

(d) A & E's are disjoint sets

Answer: a **Explanation**: **Mutually Exclusive**

Question 3

For any two events A and B:

(a) P(A - B) = P(A) - P(B)(b) $P(A - B) = P(A) - P(A \cap B)$ (c) $P(A - B) = P(B) - P(A \cap B)$ (d) $P(B - A) = P(B) + P(A \cap B)$

Answer: b

Explanation:

 $P(A \cup B) = P(A) + P(B) - P(A \cap B)$, and specialize this formula for the case (a) when A, B are mutually exclusive events and for the case (b) where A, Bare statistically independent

Ouestion 4

Five Persons A, B, C, D and E are in queue of a shop. The probability that A and E are always together, is (b) $\frac{2}{3}$ (d) $\frac{3}{5}$

(a) $\frac{1}{4}$ (c) $\frac{2}{5}$
$(c)\frac{2}{5}$
Answer: c
Explanation:
Total number of person = 5
Total outcome = 5!
A & E come together. $\underline{AE}\overline{2}\overline{3}\overline{4}$
Favorable outcome = $4! \times 2!$
probability $\frac{4! \times 2!}{5!} \left[P = \frac{favorable}{Total} \right]$
$=\frac{2}{5}$ option (c) is correct.

Ouestion 5 One card is drawn at random from a pack of 52 cards. What is the probability that the card drawn is a face (Jack, Queen, and King only)?

(a) $\frac{3}{13}$	(b) $\frac{1}{13}$
(a) $\frac{3}{13}$ (c) $\frac{3}{52}$	(d) $\frac{9}{52}$
Answer: a	
Explanation:	
Clearly, there are 52 cards, out of whi	ch there are 12 face cards.
P (getting a face card) = $\frac{12}{52} = \frac{3}{13}$.	

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NOV 2019

Question 1

Two letters are chosen from the word HOME. What is the probability that the letters chosen are not vowels? (b) $\frac{1}{6}$ (d) 0

(a) V2

$(c)\frac{2}{3}$

Answer: b

Explanation: (b) HOME Total letters = 4Total vowels = $2 \{0, E\}$ Total consonants = $2 \{H, M\}$

P (that 2 letters choosen are not vowels) $\frac{2}{4}$

P (that 2 letters choosen are consonants)
$$\frac{1}{3}$$

 $\frac{2\times 4}{1\times 3} = \frac{1}{6}$ (Required probability)

Question 2

If A, B. C are three mutually exclusive and exhaustive events such that: P(A) = 2 P(B) = 3P(C) what is P(B)?

(a) $\frac{6}{11}$	$(b)^{\frac{3}{-1}}$
1	(b) 11
$(C)\frac{1}{6}$	$(d)\frac{1}{2}$
Answer: b	з

Explanation:

(b) Since A, B, C are mutually exclusive events $P(A \cap B) = 0$, $P(B \cap C) = 0$, $P(C \cap A) = 0$ and $P(A \cap B \cap C) = 0$ Since A, B C are mutually exhaustive P(AUB) = 1We know, $P(AUB) = P(A) + P(B) + P(C) - P(A \cap B) - P(B \cap C) - P(C \cap A) + P(A \cap B \cap C)$ 1 = P(A) + P(B) + P(C) - 0 - 0 + 0P(A) + P(B) + P(C) = 1In given question; P(A) = 2P(B) = 3P(C)P(A) = 2P(B)And P (C) = $\frac{2}{3}$ P (B) Put Eq 2 and 3 in Eq 1 $2P(B) + P(B) + = \frac{2}{2}P(B) = 1$

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Explanation Given: Bag co coin =50 coin To find: the p Sol: The prob picking a one Hence the red Question 5 Is the requir No. of acc. Frequency	as in total probabilit pability of -rupee co quired pr	ty of not s f not pick oin. robability	sing a one- $y = 1 - \frac{15}{50} =$	rupee cost $\frac{35}{50} = 0.7$	in is 1 min		
Explanation Given: Bag co coin =50 coin To find: the p Sol: The prob picking a one Hence the rec Question 5 Is the requir	s in total probabilit ability of -rupee co quired pr ed prob	ty of not s f not pick oin. robability ability o	$x = 1 - \frac{15}{50} = \frac{1}{50}$	rupee cost $\frac{35}{50} = 0.7$	in is 1 min		nts?
Explanation Given: Bag co coin =50 coin To find: the p Sol: The prob picking a one Hence the red	is in total probabilit ability of -rupee co	cy of not s f not pick oin.	king a one-	rupee co		ius the pro	obability of
Explanation Given: Bag co coin =50 coin To find: the p Sol: The prob picking a one	is in total probabilit ability of -rupee co	cy of not s f not pick oin.	king a one-	rupee co		ius the pro	obability of
Explanation Given: Bag co coin =50 coin To find: the p Sol: The prob picking a one	is in total probabilit ability of -rupee co	cy of not s f not pick oin.	king a one-	rupee co		us the pro	obability of
Explanation Given: Bag co coin =50 coin To find: the p Sol: The prob	is in total probabilit pability of	ty of not s f not pick	-	-		ius the pro	obability of
Explanation Given: Bag co coin =50 coin To find: the p	is in total probabilit	y of not s	-	-			-h-sh-thten C
Explanation Given: Bag co coin =50 coin	is in total		1				
Explanation Given: Bag co	-						
		15 one r	upee coin	+25 two	rupee coi	n+10 five	rupee
	:						
Answer: d							
(a) 0.30 (c) 0.25				(d) 0.70			
random thai	n probat	mity for	not selec	(b) 0.20	e-rupee (2011 IS:	
A bag contai							selected at
Question 4	4 =		=			c	
	50						
	$=\frac{8}{36}$	$r = \frac{2}{9}$					
P (of getting s			_				
n (B) = 2		6.1	2				
B {(5, 6), (6, 5	5)}						
n(A) = 6							
A {(1, 6), (2, 5	<u> </u>		, 2), (6, 1)	ł			
B event of get	0						
n (S) = 36 A event of ge	tting sur	ע 7					
(a) When two $(S) = 36$	alces ar	e thrown	1				
Explanation							
Answer: a							
$(c)\frac{10}{36}$				(d) $\frac{2}{36}$			
$(a)\frac{2}{9}$				(b) $\frac{6}{36}$ (d) $\frac{2}{36}$			
	probabii	ity of ge	ting / or		i two uite		U W II :
vy nat is the	nrohahil	ity of go	tting 7 or	11 whor	n two dice	as aro thr	own?
<u>Question 3</u> What is the _l							
Question 3 What is the							
-							

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(a) 24

(c) 78

Answer: c

Explanation:

(No. of 4 or more accidents) = 24 + 27 + 18 +9 = 78 Total accidents = 8 + 17 + 15 + 24 + 27 + 18 + 9 = 118

DEC 2020

(b) 69 (d) 80

Question 1

When 2 fair dice are thrown. What is the probability of getting the sum which is a multiple of 3?

$(a)^{\frac{4}{-}}$	(b) $\frac{\frac{8}{36}}{\frac{12}{36}}$ (d) $\frac{\frac{12}{36}}{\frac{12}{36}}$
(a) $\frac{4}{36}$	(b) 36
(c) $\frac{2}{36}$	(d) $\frac{12}{12}$
36	36

Answer: d Explanation:

	1	2	3	4	5	6
L.	(1, 1)	(1, 2)	(1, 3)	(1, 4)	(1, 5)	(1,6)
2	(2, 1)	(2, 2)	(2, 3)	(2, 4)	(2, 5)	(2, 6)
3	(3, 1)	(3, 2)	(3, 3)	(3, 4)	(3, 5)	(3, 6)
Į.	(4, 1)	(4, 2)	(4, 3)	(4, 4)	(4, 5)	(4, 6)
)	(5, 1)	(5, 2)	(5, 3)	(5, 4)	(5, 5)	(5, 6)
5	(6, 1)	(6, 2)	(6, 3)	(6, 4)	(6, 5)	(6, 6)

Favourable outcome is = 12 Hence, $\frac{12}{36}$ is the answer

Question 2

When 3 dice are rolled simultaneously the probability of a number on the third die is greater than the sum of the numbers on two dice.

(a) $\frac{12}{216}$ (b) $\frac{36}{216}$ (c) $\frac{48}{216}$ (d) $\frac{16}{216}$	
(a) $\frac{12}{216}$ (b) $\frac{36}{216}$ (c) $\frac{48}{216}$ (d) $\frac{16}{216}$	
Answer: d	
Explanation:	
Believing all three dice are 'fair' ones.	
When three dice are thrown simultaneously; there a	are (6 * 6 * 6) = 216 possible
outcomes.	
Now, 2 ≤ Sum of those appeared on the first two dic	e ≤ 12.
But, $1 \leq$ Number appearing on third die ≤ 6 .	
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Thus, only the following outcomes on the three dice give the desired result : (1, 1, 3), (1, 1, 4), (1, 2, 4), (2, 1, 4), (1, 1, 5), (1, 2, 5), (1, 3, 5), (2, 1, 5), (3, 1, 5), (1, 1, 6), (1, 2, 5), (1, 1, 6), (1, 2, 5), (1, 2, 5), (1, 3, 5), (2, 1, 5), (3, 1, 5), (1, 1, 6), (1, 2, 5), (1, 3, 5), (2, 1, 5), (3, 1, 5), (1, 1, 6), (1, 2, 5), (1, 3, 5), (2, 1, 5), (3, 1, 5), (1, 1, 6), (1, 2, 5), (1, 3, 5), (2, 1, 5), (3, 1, 5), (1, 1, 6), (1, 2, 5), (1, 2, 5), (1, 3, 5), (2, 1, 5), (6), (1, 3, 6), (1, 4, 6), (2, 1, 6), (3, 1, 6) and (4, 1, 6). Total 16 outcomes. Thus, the required probability = (16 / 216) = (2 / 27) = 0.074074. **Question 3** If A speaks 75% of truth and B speaks 80% of truth. In what percentage both of them likely to contradict with each other in narrating the same questions (a) 0.60 (b) 0.45 (d) 0.35(c) 0.65Answer: d **Explanation**: A Speak truth 75% i.e., P (A) $=\frac{3}{4}$, $P(\bar{A}) = \frac{1}{4}$ Similarly, B speak truth 80% i.e., 75% i.e., $P(B) = \frac{4}{5}$, $P(\overline{B}) = \frac{1}{5}$ While contradicting the narration Probability = P(A) $P(\overline{B}) + P(\overline{A})P(B)$ $\frac{3}{4} \times \frac{1}{5} + \frac{1}{4} \times \frac{4}{5}$ $\frac{7}{20} = \frac{7}{20} \times 100\% = 35\%$ **Ouestion 4** If two Unbiased Coins are tossed what is Probability of getting at least one tail? (a) 1/4 (b) 3/4(c) 1/2(d) 2/3**Answer: b Explanation:** At least one tail LET A=event of getting at least one tail (HT,TH,TT) P(A) = (N(A))/(N(S)) = 3/4**IAN 2021 Ouestion 1** Two dice are thrown simultaneously. The probability of a total score of 5 from the outcomes of dice is ' (a) 1/18(b)1/12 (d) 2/5(c) 1/9 Answer: c **Explanation**: If two dice are thrown simultaneously, the total number of sample space is 36 Favourable outcomes = (1, 4), (4, 1), (2, 3) and (3, 2)Therefore, the required probability = 4/36 = 1/9.

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Question 2

If an unbiased coin is tossed twice, then the probability of obtaining at least one tail is '

(a) 1	(b) 0.5
(c) 0.75	(d) 0.25
Answer: c	
Explanation:	
we know that P(HHH)+P(HT)+ P(TH)+ P	P(TT) = 1
P(HT) + P(TH) + P(TT) = 1 - P(HH)	
$=1-\frac{1}{4}=\frac{3}{4}$	
= 0.75	

Question 3

If an unbiased coin is tossed three times. What is the probability of getting more than one head?

(a) $\frac{1}{2}$	(b) $\frac{3}{8}$
(c) $\frac{7}{8}$	(d) $\frac{1}{3}$

Answer: a

Explanation:

Given: coin tossed three times

To find: the probability of getting more than one head Sol: The sample space is {HHH, HHT, HTH, THT, THH, TTT, n(S)=8

The favourable outcomes for getting more than one head is {HHH, HHT, HTH, THH}, n(E)=4

Hence, the probability of getting more than one head is $\frac{n(E)}{n(S)} = \frac{4}{8} = \frac{1}{2}$

<u>JULY 2021</u>

Question 1

A biased coin is such that the probability of getting a head is thrice the probability of getting a tail. If the coin is tossed 4 times, what is the probability of getting a head all the times?

(b) 81/128 (d) 81/64

0 0	
(a) 2/5	
(c) 81/256	
Answer: Options (c)	
Explanation:	

Sample Space = $4 \times 4 \times 4 \times 4 = 256$

 $\therefore \text{Probability of getting a tail} = \frac{\text{Total favourable outcome}}{\text{Sample Space}} = \frac{81}{256}$

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<u>Question 2</u> If there are 16 phones, 10 of them are Android and 6 of them are of Apple, then
the probability of 4 randomly selected phones to include 2 Android and 2 Apple
phone is
(a) 0.47 (b) 0.51 (c) 0.27
(c) 0.37 (d) 0.27
Answer: Options (c)
Explanation:
· Probability of 4 randomly selected phones to include 2 Android and 2 Apple phone
$=\frac{\text{Total favourable outcome}}{\text{Sample Space}} = \frac{6}{16}$
Sample Space 16
Question 3
If there are 48 marbles marked with numbers 1 to 48, then the probability of
selecting a marble having the number divisible by 4 is
(a) 1/2 (b) 2/3
(c) 1/3 (d) 1/4
Answer: Options (b)
Explanation:
Given: Marbles with numbers marked on each of them are 1, 2, 3, 4 48
∴ Probability of selecting a marble having the number divisible by
Total favourableoutcome
$4 = \frac{10 \tan 1000 \tan 10000000000}{\text{Sample Space}}$
32 2
$\overline{48} = \overline{3}$
Question 4
In a class, 40% of the students study math and science. 60% of the students
study math. What is the probability of a student studying science given he/she
is already studying math?
(a) 0.25 (b) 0.40
(c) 0.67 (d) 0.60
Answer: Options (c)
Explanation:
P (Mands) = 0.60
P(M) = 0.60
P (S M) = $\frac{P(M \text{ and } S)}{P(S)} = \frac{0.40}{0.60} = \frac{2}{3} = 0.67$
Question 5
A begs contains 7 blue and 5 green balls. One ball is drawn at random. The

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probability of getting a Blue ball is	
(a) 5/12	(b) 12/35
(c) 7/12	(d) 0
Answer: Options (c)	
Explanation:	
Number of green balls=5 Number of blue balls=7	
Total number of balls=12	
Probability of not green balls =number of	not green balls/ total number of balls
=7/12.	0 /
<u>Question 6</u> The probability that a football team los	sing a match at Kolkata is 3/5 and wining
a match at Bengaluru is 6/7, the proba	
match is	(h) 10/25
(a) 3/35 (c) 32/35	(b) 18/35 (d) 17/35
Answer: Options (c)	(u) 17/33
Explanation:	
P (winning) + P (losing) + P (drawing) = 1	L
3/5 + 6/7 +P (drawing) =1	
P (drawing) = 32/35.	
DEC	<u>2021</u>
Question 1	
For any two dependent events A and B P(A \cap B) = 10/33. What are the values of (a) 5/9, 6/11 (c) 1/9, 2/9	<pre>, P(A) = 5/9 and P(B) = 6/11 and P(and of P (A/B) and P (B/ A)? (b) 5/6, 6/11 (d) 2/9, 4/9</pre>
Answer: a	
Explanation: $P(A \cap B) = 10/33 = 10 = 11 = 10 = 5$	
$P(A/B) = \frac{P(B)}{P(B)} = \frac{P(B)}{6/11} = \frac{P(B)}{33} \times \frac{P(B)}{6} = \frac{P(B)}{18} = \frac{P(B)}{9}$	
$P(A/B) = \frac{P(A \cap B)}{P(B)} = \frac{10/33}{6/11} = \frac{10}{33} \times \frac{11}{6} = \frac{10}{18} = \frac{5}{9}$ $P(B/A) = \frac{10/33}{5/9} = \frac{10}{33} \times \frac{9}{5} = \frac{18}{33} = \frac{6}{11}$	
5/9 33 5 33 11	
Question 2	
Which of the following pair of events E	-
	(b) E = {Sita a studies in a school} and F =
is studying in a college}	{Sita is a play back singer}
ioin our telexans chourse	15.32

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FOR ENQU	JIRY – 626296960	4			6262969699
family } and I more than or Answer: a	-			Banu studied B e and} F= {Ban	3.A. English iu can reach English
the probability	re said to be m cy of both such en options, it is	events occu	irring toget	ther is zero.	ppear together, i.e., s a 13 year old kid
Question 3					
Assume that			-		ella salesman can Rs. 100 per day if
	· ·				the salesman is
(a) 400			(b) 20		
(c) 100			(d) 0		
Answer: c					
Explanation:					
<u>X</u>		P		px 160	
400		0.4			
-100		0.6		-60 Px= 1 (00
				T A= 1	JU
Question 4					
	lity distributi	on of a rand	lom varia	ble x is given b	below:
X:	1	2	4	5	6
P :	0.15	0.25	0.2	0.3	0.1
	tandard devi	ation of x?			
(a) 1.49			(b) 1.5		
(c) 1.69 (d) 1.72					
Answer: c					
Explanation: $F(x) = \sum px = 0$		(10.25) + (1.25)		(-1, 0, 20) + (6)	0 10) - 2 55
				$(5 \times 0.30) + (6 \times 0.30) + (5^2 \times 0.30)$	$(62 \times 0.10) = 3.55$
$V(x) = E(x^2) - 4$)) + (5 ~ 0.00)	+ (02 ~ 0.10) ~ 10.10
$\sigma_{\rm x}: \sqrt{2.8475} =$, (0.00)			
UX: V 2:0 1 . C	1.07				
Question 5					
-	20 males and	d 15 females	s, 12 male	s and 8 femal	es are service
holders. Wha	it is the proba	ability that a	a person s	elected at ran	ndom from the
					15. 33

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FOR ENQUIRY – 6262969604	6262969699
group is a service holder given that the s	elected person is a male?
(a) 0.40	(b) 0.45
(c) 0.60	(d) 0.55
Answer: c	
Explanation:	
Since the selected person is a male, the tota	l number of outcomes = 20.
Number of Favourable Outcomes =12	
Probability = $\frac{\text{Number of Favourable Outcomes}}{\text{Total Number of Outcomes}}$	
Probability = $12/20 = 0.60$	
Question 6	
There are 3 boxes with the following cor	nposition:
Box I : 7 Red + 5 White + 4 Blue balls	
Box Il : 5 Red + 6 White + 3 Blue balls	
Box Ill : 4 Red + 3 White + 2 Blue balls	
One of the boxes is selected at random a	nd a ball is drawn from lt. What is the
probability the drawn ball is red?	
(a) 1249/3024	(b) 1247/3004
(c) 1147/3024	(d) 1/2
Answer: a	
Explanation:	
Case 1 - Box I is drawn.	
Probability of drawing $Box = 1/3$ and Probability of drawing a rad ball from it = 7	
Probability of drawing a red ball from it = 7	/16
Case 2 - Box I is drawn. I Probability of drawing Box II = 1/3 and	
Probability of drawing Box I $ $ = 1/3 and Probability of drawing a red ball from it = 5	/1/
Case 3 - Box III is drawn.	/14
Probability of drawing Box III = $1/3$ and	
Probability of drawing a red ball from it = 4	. /9
Therefore,	
Probability = $\left(\frac{1}{3} \times \frac{7}{16}\right) + \left(\frac{1}{3} \times \frac{5}{14}\right) + \left(\frac{1}{3} \times \frac{4}{9}\right) =$	0.4130
Now, try the options.	
Option (a) - 1249/3024	
$1249 \div 3024 = 0.4130$	
Therefore, option (a) is the answer.	
Question 7	
For a probability distribution, probabili	ty is given by, $P(Xi) = \frac{X_i}{L}$, $X_i = 1, 2$ 9.
The value of K is	

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\rightarrow 0
b) 9
d) 81
^

Answer: c

Explanation:

Note: P(X) = k should be ideally written as $P(X_i) = \frac{X_i}{k}$

We know that sum of Probabilities is 1.

Therefore,

 $\frac{1}{k} + \frac{2}{k} + \frac{3}{k} + \frac{4}{k} + \frac{5}{k} + \frac{6}{k} + \frac{7}{k} + \frac{8}{k} + \frac{9}{k} = 1$

$$\frac{1+2+3+4+5+6+7+3+9}{k} = 1$$

We know that sum of first n natural numbers is given by $\frac{n(n+1)}{2}$

Therefore,
$$\frac{9(9+1)}{2} \div k = 1$$

 $\frac{90}{2} \times \frac{1}{k} = 1$
 $\frac{45}{k} = 1$
 $k = 45$

<u>JUNE 2022</u>

Question 1

A dice is rolled twice. Find the probability of getting numbers multiple of 3 or 5 ? (a) 1/3 (b) $\frac{1}{4}$ (c) 1/2 (d) 1/6 Answer: c Explanation: If one dice is rolled twice then No of sample space n (s) = 36 Events (A) = "getting No is multiple of '3' or '5' (A) = { (2, 1), (5, 1) (1, 5) (4, 2) (2, 4) (3, 3) (6,3) (3, 6) (5,4) (4, 5) (6, 6), (4, 1) (1, 4) (2, 3) (3, 2) (6, 4) (4, 6) (5, 5)} n (A) = 18 P (A) = $\frac{n(A)}{n(S)} = \frac{18}{36} = \frac{1}{2}$

Question 2

What is the probability of occurrence of leap year having 53 Sunday? (a) 1/7 (b) 2/7

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(c) 3/7

(d) 4/7

Answer: b Explanation: There are 366 days in a year 2 days may be (i) Sunday & Monday (ii) Monday & Tuesday (;i) Tuesday & Wednesday (iv) Wednesday & Thursday (v) Thursday & Friday (vi) Friday & Saturday I (vi) Saturday & Sunday Here n(S) = 7n(A) = 2 $P(A) = \frac{n(A)}{n(S)} = \frac{2}{7}$ **Ouestion 3** If in a bag of 30 balls numbered from 1 to 30. Two balls are drawn find probability of getting a ball being multiple of 2 or 5 (a) 108/465 (b) 117/435 (c) 117/300 (d) 116/485 **Answer: b Explanation:** In a bag of 30 ball's numbered From '1 to 30'. If two balls are drawn from the ball then sample space n (s) = ${}^{30}C_2$ $=\frac{30\times29}{2\times1}=435$ A getting ball No as multiple of 2 n(A) = ${}^{15}C_2 = \frac{15 \times 14}{2 \times 1} = 105$ $P(A) = \frac{105}{435}$ B- getting ball No as multiple of 5 $n(B) = {}^{6}C_{2} = \frac{6 \times 5}{2 \times 1} = 15$ $P(B) = \frac{15}{425}$ $A \cap B$ getting bal No is multiple of 3 and 5 (10) n (A \cap B)= ${}^{3}C_{2}$ = 3 P (A∩B) = $\frac{3}{435}$ $P(2' \text{ or } '5') = P(A \cup B)$

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$= P(A) + P(B) - P(A \cap B)$	
$=\frac{105}{435}+\frac{15}{435}-\frac{3}{435}$	
435 435 435	
$=\frac{105+15-3}{436}$	
- 436	
(117)	
$=\left(\frac{117}{435}\right)$	
Question 4	
Two perfect dice are rolled what is the pr	obability that one appears at least in
one of the dice?	
	b) 11/36
	(d) 15/36
Answer: b Explanation:	
If two dice are Rolled then sample space n(s)	= 36
Event 'A "getting '1' appears at least in one of	
$\{(1,2),(1,3),(1,4),(1,5),(1,6),(1,1),(2,1),(3,1)\}$	(4, 1) (5, 1) (6, 1)}
n(A) = 11	
P (A) = $\frac{n(A)}{n(S)} = \frac{11}{36}$	
Our action F	
Question 5 If two dice are rolled and one of the dice s	hows 1 at a point then how many such
outcome can be done where it is known th	
	(b) 7
	(d) 9
Answer: a	
Explanation:	
If two dice are Rolled then sample space n(s)	
Event (A) = "getting one of the dice show as $(1,1)$ (1,2) (1,3) (1,4) (1,5) (1,6) (2,1) (3,1)	
n(A) = 11	
Question 6	
If P(A) = 0.3 ; P (B) = 0.8 and P $\left(\frac{B}{A}\right)$ = 0.5, fi	nd P(A U B)
	b) 0.95
(c) 0.55	(d) 0.5

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Answer: b

Explanation: Given P (A) = 0.3, P (B) = 0.8, P (B/A) = 0.5 P (B/A) = $\frac{P(A \cap B)}{P(A)}$ $0.5 = \frac{P(A \cap B)}{0.3}$ P (A \cap B) = 0.5 x 0.3 = 0.15 P (A \cup B) = P(A) + P (B) - P (A \cap B) = 0.3 + 0.8 - 0.15 = 1.10 - 0.15 = 0.95

Question 7

If P Q are the odds in favour of an event, then the probability of that event is

(a) p/q(b) $\frac{p}{p+q}$ (c) $\frac{q}{p+q}$ (d) q/p

Answer: b

Explanation: If odd in favour of an event = p: q Then Probability of success P (A) = $\frac{p}{(p+q)}$

DEC 2022

Question 1 A machine is made of two parts A and B. The manufacturing Process of each part is such that probability of defective in part A is 0.08 and that B is 0.05. What is the probability that the assembled part will not have any defect?

F		
a) 0.934	b) 0.864	
c) 0.85	d) 0.874	
Answer: Options (b)		
Explanation:		
Probability of Defective Part a =	9/100	
Probability of non-defective of $a = 1 - 9/100 = 91/100$		
Probability of Defective Part b = $5/100 = 1/20$		
Probability of non-defective part $b = 1 - 1/20 = 19/20$		
Assembly will not be defective if both part are non-defective		
$= (91/100) \times (19/20)$	-	
=1729/2000		
= 0.8645		

Question 2 If P(A) = $\frac{1}{3}$, P(B) = $\frac{3}{4}$ and P(A \cup B) = $\frac{11}{12}$ then P $\left(\frac{B}{A}\right)$ is: b) $\frac{4}{9}$ d) $\frac{1}{8}$ a) c) $\frac{1}{2}$ **Answer: Options (c) Explanation:** P(A) = 1/3P(B) = 1/4Now, P(AUB) = 11/12 $= P(A) + P(B) - P(A \cap B) = 11/12$ $=> P(A \cap B) = (1/3 + 3/4) - 11/12 = 2/12 = 1/6$ Therefore. $P(B/A) = P(A \cap B) / P(A)$ = (1/6) / (1/3)= 1/2**Ouestion 3** The probability that a leap year has 53 Mondays is: b) $\frac{2}{3}{\frac{3}{5}}$ a) $\frac{1}{7}$ c) $\frac{2}{7}$ **Answer: Options (c) Explanation**: 1 year = 365 daysA leap year has 366 days A year has 52 weeks. Hence there will be 52 Mondays for sure. 52 weeks =52×7=364 days 366-364=2 days In a leap year there will be 52 Mondays and 2 days will be left. These 2 days can be: Sunday, Monday Monday, Tuesday Tuesday, Wednesday Wednesday, Thursday Thursday, Friday Friday, Saturday Saturday, Sunday Of these total 7 outcomes, the favourable outcomes are 2. Hence the probability of getting 53 Mondays in a leap year $=\frac{2}{3}$

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Question 4

Suppose A and B are two independent events with probabilities $P(A) \neq 0$ and $P(B) \neq 0$. Let A' and B' be their complements. Which one of the following statements is FALSE?

b) P(A/B) = P(A)

d) $P(A' \cap B') = P(A') P(B')$

- a) $P(A \cap B) = P(A) P(B)$
- c) $P(A \cup B) = P(A) + P(B)$

Answer: Options (c) Explanation:

Since A and B are independent $P(A \cap B) = P(A). P(B)$ $P\left(\frac{A}{B}\right) = \frac{P(A \cap B)}{P(B)} = \frac{P(A) \cdot P(B)}{P(B)} = P(A)$

 $P(\bar{A} \cap \bar{B}) = P(\bar{A}). P(\bar{B}) = [1 - P(A)] [1 - P(B)]$ $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

Ouestion 5

The theorem of Compound Probability states that for any two events A and B.

- a) $P(A \cap B)=P(A) \times P(B/A)$ b) $P(A \cup B) = P(A) \times P(B/A)$ c) $P(A \cap B)=P(A) \times P(B)$ d) $P(A \cup B) = P(A) + P(B) P(B)$

d) $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

Answer: Options (d)

Explanation:

If two events, A and B, are mutually exclusive, then the probability that either A or B occurs is the sum of their probabilities.

For mutually inclusive events, P(A or B) = P(A) + P(B) - P(A and B).

Question 6

If a number is selected at random from the first 50 natural numbers, what will be the probability that the selected number is a multiple of 3 or 4?

a) 5/50	b) 12/25
c) 3/50	d) 4/25
Answer: Options (b)	
Explanation:	
n(s)=1,2,3,,50	
multiple of 3=3,6,9,,48	
number of multiples of 3=16	
number of multiples of 4=12	
number of multiples of 3 and 4=4	
∴n(A)=16+12-4=28-4=24	
P(E)= 24/ 50	
=12/25	

Question 7

If three coins are tossed simultaneously, what is the probability of getting two heads together?

a) 1/4	b) 1/8
c) 5/8	d) 3/8

Answer: Options (d)

Explanation:

When three coins are tossed then the outcome will be any one of these combinations. (TTT, THT, TTH, THH. HTT, HHT, HTH, HHH).

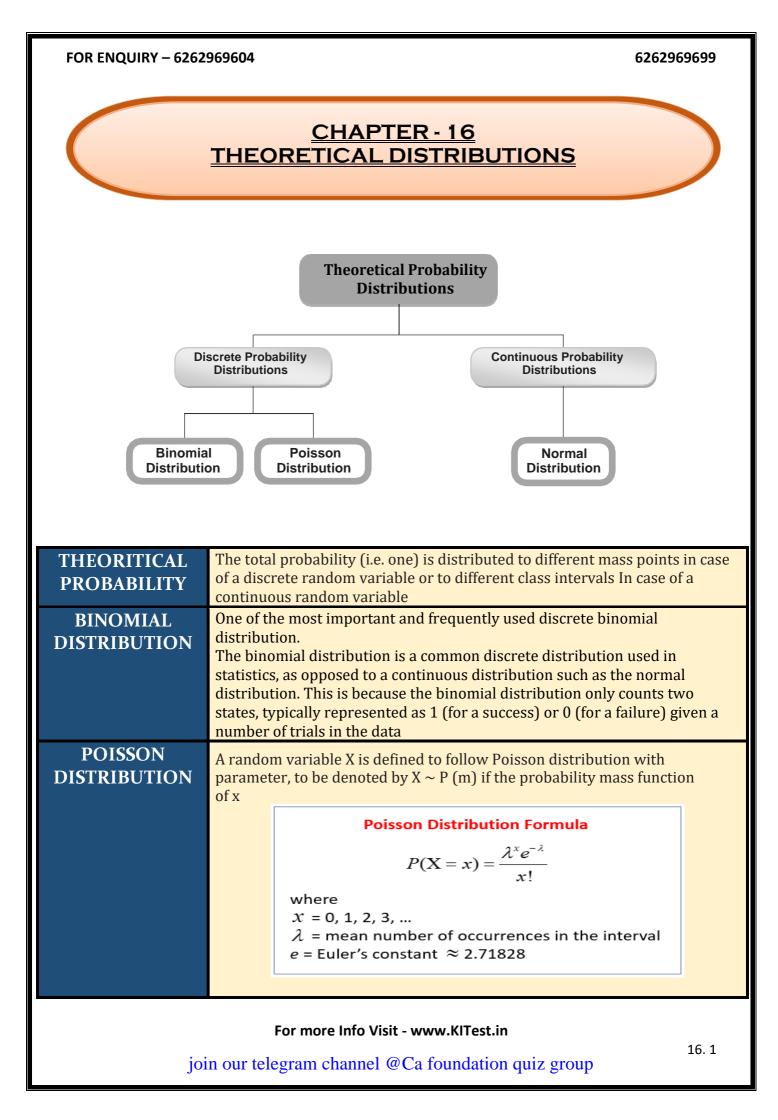
So, the total number of outcomes is 8.

Now, for exactly two heads, the favorable outcome is (THH, HHT, HTH). We can say that the total number of favorable outcomes is 3.

Again, from the formula

Probability = Number of favorable outcomes/Total number of outcomes Probability = 3/8

• The probability of getting exactly two heads is 3/8.



FOR ENQUIRY - 6262969604 6262969699 NORMAL DISTRIBUTIONS If a continuous random variable has a distribution with a graph that is symmetric and Curve is bell-shaped NORMAL and symmetric bell-shaped and can be $y = \frac{e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)}}{e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)}}$ DISTRIBUTIONS described by the equation M Value we say that it has a normal distribution. **Properties of the Normal Distribution** The normal distribution curve is bell-shaped. The mean, median, and mode are equal and located at the center of the distribution. □ The normal distribution curve is **unimodal** (single mode). The curve is **symmetrical** about the mean. The curve is **continuous**. The curve never touches the x-axis. The total area under the normal distribution curve is equal to 1 or 100%. The Standard Normal Distribution **STANDARD** If each data value of a normally distributed random NORMAL variable x is transformed into a z-score, the result will be the standard normal distribution. DISTRIBUTION Standard Normal Normal Distribution Distribution $z = \frac{x - \mu}{2}$ o μ µ=0 Use the Standard Normal Table to find the cumulative area under the standard normal curve.

POISSON DISTRIBUTION:

Question1

In a Poisson Distribution, if 'n' is the number of trials and 'p' is the probability of success, then the mean value is given by

(a) m = n p

(b) m =
$$(np)^2$$

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(c) m = n p (1-p)

(d) m = p

Answer: a **Explanation**:

For a discrete probability function, the mean value or the expected value is given by Mean $(\mu) = \sum_{x=0}^{n} xp(x)$

For Poisson Distribution P(x) = $\frac{e^{-m_m x}}{x!}$ substitute in above equation and solve to get μ = m = n p.

Question2

If 'm' is the mean of A Poisson Distribution, then variance is given by (b) $m_{\frac{1}{2}}^{\frac{1}{2}}$ (d) $m_{\frac{1}{2}}^{\frac{1}{2}}$ (a) m^2

(c) m

Answer: c

Explanation:

For a discrete probability function, the variance is given by Variance (v) = $\sum_{x=0}^{n} x^2 p(x) - \mu^2$

Where μ is the mean, substitute $P(x) = \frac{e^{-m_m x}}{x!}$ in the above equation and put $\mu = m$ to obtain V = m.

Ouestion 3

The p.d.f of Poisson distribution is given by

(a) $\frac{e^{-m_m x}}{x!}$	(b) $\frac{e^{-m_{\chi!}}}{m^{\chi}}$
(c) $\frac{x!}{m^x e^{-m}}$	(d) $\frac{e^m m^x}{x!}$
A	

Answer: a **Explanation**:

This is a standard formula for Poisson distribution, is needs no explanation. Even though if you are interested to know the derivations in detail, you can refer to any of the books or source on internet that speaks of this matter.

Question 4

If 'm' is the mean of a Poisson distribution, the standard deviation is given by

(a) $m^{1/2}$	(b) m ²
(c) m	(d) $m/_2$
Answer: a	

Explanation:

The variance of a Poisson distribution with mean 'm' is given by V = m, hence standard Deviation = $(Variance)^{1/2} = m^{1/2}$

Question 5

In a Poisson distribution the mean and variance are equal (a) True (b) False (d) Not justifiable (c) Can't say Answer: a **Explanation**: Mean = m Variance = m

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\therefore Mean = Variance.

Ouestion 6

In a Poisson distribution, if mean (m) = e, then P(x) is given by (b) $\frac{e^{-m_{x!}}}{m^x}$ (d) $\frac{e^{m_m x}}{x!}$

(a)
$$\frac{e^{-m_m x}}{\frac{x!}{x!}}$$

 $\int \frac{1}{m^x} e^{-m}$ Answer: a

Explanation: Put m = e.

```
P(x) = \frac{e^{-m}m^x}{x!}
```

Question 7

Poisson distribution is applied for

(a) Continuous Random variable (c) Irregular Random variable **Answer: b**

(b) Discrete Random variable (d) Uncertain Random Variable

Explanation:

Poisson distribution along with Binomial Distribution is applied for discrete Random variable. Speaking more precisely, Poisson Distribution is an extension of Binomial Distribution for larger values 'n'. since Binomial Distribution is of discrete nature, so is its extension Poisson Distribution.

Ouestion 8

If 'm' is the mean of Poisons Distribution, the P(0) is given by (a) e^{-m} (b) e^m (c) e (d) m^{-e} Answer: a **Explanation:** $P(x) = \frac{e^{-m_m x}}{x!}$ Put x = 0, to obtain e^{-m} .

Ouestion 9

In a Poisson distribution, the mean and standard deviation are equal (b) False (a) True (c) Can't say (d) Not justified **Answer: b Explanation**: In a Poisson distribution. Mean = mStandard deviation = $m^{1}/_{2}$: Mean and Standard deviation are not equal.

Ouestion 10

For a Poisson distribution, if mean (m) = 1, then P(1) is	
(a) $\frac{1}{e}$	(b) e
(c) $\frac{\ddot{e}}{2}$	(d) Indetermin

(d) Indeterminate

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Answer: a **Explanation:** $P(x) = \frac{e^{-m_m x}}{x!}$ Put m = x = 1, (given) to obtain $1/\rho$.

Ouestion 11

The recurrence relation between P(x) and P(x+1) in a Poisson distribution is given by (b) m P(x+1) - P(x) = 0(a) P(x+1) - m P(x) = 0(c) (x+1) P(x+1) - m P(x) = 0(d) (x+1) P(x) - x P(x+1) = 0**Answer: c Explanation**: $P(x) = \frac{e^{-m_m x}}{x!}$ $P(x+1) = e^{-m_m (x+1)}$ Divide P(x + 1) by P(x) and rearrange to obtain (x+1) P(x+1) - m P(x) = 0.

Ouestion 12

The mean value for an event X to occur is 2 in a day. Find the probability of event X to occur thrice in a day.

(a) 0.1804 (c) 0.18 **Answer: b**

Explanation:

(b) 0.1804465 (d) None

Mean, m=2 x = 3

Probability of the event to occur thrice, P (3; 2) = $e^{-2} \frac{2^3}{3!} = 0.1804465$

Ouestion 13

A man was able to complete 3 files a day on an average. Find the probability that he can complete 5 files the next day.

(a) 0.108	(b) 0.1008
(c) 0.008	(d) None
Answer: b	

Explanation:

Here we know this is a Poisson experiment with following values given:

 μ = 3, average number of files completed a day

X = 5, the number of files required to be completed next day

And e = 2.71828 being a constant

On substituting the values in the Poisson distribution formula mentioned above we get the Poisson probability in this case.

We get

P(x, μ) = $\frac{(e^{-\mu})(\mu^{x})}{x!}$ → P (5, 3) = $\frac{(2.71828)^{-3}(3^{5})}{r!}$

= 0.1008 approximately.

Hence the probability for the person to complete 5 files the next day is 0.1008 approximately.

Question 14

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The number of calls coming per minute into a hotels reservation center is Poisson random variable with mean 3. Find the probability that no calls come in a given 1-minute period

(b) e^3 (d) m^{-e}

Answer: a Explanation:

Let x denote the number of calls coming in that given 1 minute period. X ~ Poisson(3) $P(x = 0) = \frac{e^{-3}3^{0}}{0!}$

 $= e^{-3}$

(a) e^{-3}

(c) e

Question 15

 If the random variable X follows a Poisson distribution with mean 3,4, find P(x=6)

 (a) 0.071604409
 (b) 0.00125948

 (c) 0.0023698
 (d) 0.015792

 Answer: a
 Explanation:

This can be written more quickly as: if X = Po(3,4) Find (x = 6) Now $P(x = 6) = \frac{e^{-\lambda}\lambda^6}{2}$

$$1(x - 0) - \frac{6!}{6!}$$

 $= \frac{e^{-3.4}(3.4)^6}{6!} (\text{mean}, \lambda = 3.4)$ = 0.071604409 or 0.072(to 3 d.p.)

BINOMIAL DISTRIBUTION:

Question 1

In a binomial Distribution, 'if 'n' is the number of trials and 'p' is the probability of success, then the mean value is given by

(a) np	(b) n
(c) p	(d) np(1 – p)
A	

Answer: a Explanation:

For a discrete probability function, the mean value or the expected value is given by Mean $(\mu) \sum_{x=0}^{n} xp(x)$

For Binomial Distribution $P(x) = {}^{x}C_{x} p^{x}q^{(n-x)}$, substitute in the above equation and solve to get $\mu = np$.

Question 2

In the Binomial Distribution, If p, q and n are probability of success, failure and number of trials respectively then variance is given by (a) np (b) npq (c) np²q (d) npq² Answer: b Explanation:

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For a discrete probability function, the variance is given by Variance (V) = $\sum_{x=0}^{n} x^2 p(x) - \mu^2$ Where μ is the mean, substitute P(x) = P(x) = ^xC_x p^xq^(n-x), in the above equation and put μ = np to obtain V = npq.

Question 3

If 'x' is a random variable, taking values 'x' probability of success and failure being 'p' and 'q' respectively and 'n' trials being conducted, then what is the probability that 'x' takes values 'x'? Use Binomial Distribution

(a) $P(X = x) = {}^{n}C_{x}p^{x}q^{x}$ (b) $P(X = x) = {}^{n}C_{x} p^{x} q^{(n-x)}$ (c) $P9X = x) = {}^{n}C_{x} p^{x} q^{(n-x)}$ (d) $P(x = x) = {}^{x}C_{n}p^{x}q^{x}$

Answer: b

Explanation: It is the formula for Binomial Distribution that is asked here which is given by $P(X = x) = {}^{n}C_{x} p^{x} q^{(n-x)}$

Question 4

If 'p', 'q' and 'n' are probability of success, failure and number of trials respectively in a Binomial Distribution, what is its standard Deviation?

(a) $(np)^{1/2}$	(b) $(pq)^{1/2}$
(c) $(np)^2$	(d) $(npq)^{1/2}$

Answer: d

Explanation: The variance (V) for a Binomial Distribution is given by V = npq

Question 5

In a Binomial Distribution, the mean and variance are equal(a) True(b) False(c) can't say(d) Not justifiableAnswer: bExplanation:Mean = npVariance = npq∴ Mean and Variance are not equal.

Question 6

It is suitable to use Binomial Distribution only for

(a) Large value of 'n'
(b) Fractional values of 'n'
(c) Small values of 'n'
(d) Any values 'n'
Answer: c
Explanation:
As the value of 'n' increase, It becomes difficult and tedious to calculate value of "Cx.

Question 7

For larger values of 'n' Binomial Distribution		
(a) Loses its discreteness	(b) Tends to Poisson Distribution	
(c) Stays as it is	(d) Gives oscillatory values	

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Answer: b Explanation: Where m = np is the mean of Poisson Distribution. **Ouestion 8** In a Binomial Distribution, if p = q, then P(X = x) is given by (a) ${}^{n}C_{x}(0.5)^{n}$ (b) ${}^{x}C_{n}(0.5)^{n}$ (c) ${}^{n}C_{x}p^{(n-x)}$ (d) ${}^{x}C_{n}p^{(n-x)}$ Answer: a **Explanation**: If p = q then p = 0.5Substituting in $P(x) = {}^{n}C_{x}p^{x}q^{(n-x)}$ we get ${}^{n}C_{x}(0.5)$ n. **Ouestion 9 Binomial Distribution is a** (a) Continuous distribution (b) Discrete distribution (c) Irregular distribution (d) Not a Probability distribution **Answer: b Explanation**: It is applied to a discrete Random variable, hence it is discrete distribution **Ouestion 10**

15 dates are selected at random, what is the probability of getting two Sundays? (a) 0.29 (b) 34 (c) 56 (d) 78 **Answer: a Explanation:**

If X denotes the number at Sundays. Then it is obvious that X follows binomial distribution with parameter n = 15 and p = probability of a Sunday in a week = $\frac{1}{7}$ and q = 1 - p = $\frac{6}{7}$

Question 11

The incidence of occupational disease in an industry is such that the workmen have a 10% chance of suffering from it. What is the probability that out of 5 workmen, 3 or more will contract the disease?

(a) 890 (c) .00086 Answer: c Explanation; (b) .0086 (d) None

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Let x denote the number of workmen in the sample. X follows binomial with parameters n = 5 and p = probability that a workman suffers from the occupational disease = 0.1 Hence q = 1 - 0.1 = 0.9 Thus f (x) = $5_{c_x}(0.1)^x \cdot (0.9)^{5-x}$ For x = 0, 1, 25. The probability that 3 or more workmen will contract the disease = P (x \ge 3) = f (3) + f (4) + f (5) = $5_{c_3}(0.1)^3 (0.9)^{5-3} + 5_{c_4}(0.1)^4 \cdot (0.9)^{5-4} + 5_{c_5}(0.1)^5$ = 10 × 0.001 × 0.814 + 5 × 0.0001 × 0.9 + 1 × 0.00001 = 0.0081 + 0.00045 + 0.00001

= 0.0086.

Question 12

Find the probability of a success for the binomial distribution satisfying the following relation 4 P (x = 4) = P (x = 2) and having the parameter n as six.

(a) $P \neq 1$ (b) $P \neq -1$ (d) P = 0(c) P = 1**Answer: b Explanation**: We are given that n = 6. The probability mass function of x is given by $F(x) = n_{c_x} p^x q^{n-x} = 6_{c_x} p^x q^{n-x}$ For x = 0, 1,6, Thus P(x = 4) = f(4); $= 6_{c_4} p^4 q^{6-4} = 15 p^4 q^2$ And P(x = 2) = f(2) $= 6_{c_4} p^2 q^{6-2} = 15 p^2 q^4$ Hence 4 P (x = 4) = P (x = 2) $= 60 p^4 q^2 = 15 p^2 q^4$ $= 15 p^2 q^2 (4p^2 - q^2) = 0$ $=4p^{2}-q^{2}=0(as p ? 0, q ? 0)$ $=4p^{2}-(1-p)^{2}=0$ (as q = 1 - p) = (2p + 1 - p) = 0 or (2p - 1 + p) = 0 $= p = -1 \text{ or } p = \frac{1}{2} \text{ thus } p = \frac{1}{2} (\text{as } p \neq -1)$

NORMAL DISTRIBUTION:

Question 1

Normal distribution is applied for

(a) Continuous Random Distribution (c) Irregular Random Variable (b) Discrete Random Variable (d) Uncertain Random Variable

Answer: a

Explanation:

Normal Distribution is applied for Continuous Random Distribution. A discrete probability distribution is a probability distribution characterized by a probability mass function. Thus, the distribution of a random variable x is discrete, and x is called a discrete random variable, if, as u runs through the set of all possible values of x.

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<u>Question 2</u>	
The shape of the Normal curve is	
(a) Bell shaped	(b) Flat
(c) Circular	(d) Spiked
Answer: a	
Explanation:	
Due to the nature of the probability Mass fun	ction, a bell shaped curve is obtained.
Question 3	
Normal Distribution is symmetric is abou	
(a) Variance	(b) Mean
(c) Standard deviation	(d) Covariance
Answer: b	
Explanation:	
Due to the very nature of p.m.f of Normal Dis symmetric about its mean.	tribution, the graph appears such that it is
Question 4	
For a standard normal variate, the value of	of mean is
(a) ∞	(b) 1
(c) 0	(d) Not defined
Answer: c	(u) Not defined
Explanation:	
•	dand deviation = 1, then its called as standard
Normal variate. Here, the converse is asked.	dard deviation = 1, then its called as standard
<u>Question 5</u> The area under a standard normal curve i	
(a) 0 (c) ∞	(b) 1 (d) Not defined
Answer: b	(u) Not defined
Explanation:	
-	ll probabilities is 1. Area under normal curve
refers to sum of all probabilities.	in probabilities is 1. mea under normal curve
*	
Question 6	
The standard normal curve is symmetric	about the value.
(a) ∞	(b) 0
(c) 0.5	(d) 1
Answer: b	
Explanation:	
-	an, for standard normal curve or variate mean = 0.
Question 7	
Question 7 For a standard normal variate. The value	of standard deviation is
(a) 3	(b) 1
(a) 5 (c) ∞	(d) Not defined
Answer: b	(u) not defined
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Explanation:

If the mean and standard deviation of a normal variate are 0 and 1 respectively, it is called as standard normal variate.

Ouestion 8

Normal Distribution is also known as (a) Cauchy's Distribution (b) Laplacian Distribution (c) Gaussian Distribution (d) Lagrangian Distribution Answer; c **Explanation**: Named after the one who proposed it. For further details, refer to books or internet.

Ouestion 9

Skewers of Normal distribution is

(a) Negative

(b) Positive (d) Undefined

(c) 0

Answer: c

Explanation:

Since the normal curve is symmetric about its mean, its skewness is zero. This is a theoretical explanation for mathematical proofs, you can refer to books or website that Speak on the same in detail.

Ouestion 10

For a normal distribution its mean, median, mode are equal

(a) True	(b) False
(c) Not defined	(d) Can't say
Answer: a	

Explanation:

It has theoretical evidence that requires some serious background on several topics for more details you can refer to any book or website that speaks on the same.

Ouestion 11

In Normal distribution, the highest value of ordinate occurs at (-) N/

(a) Mean	(b) Variance
(c) Extremes	(d) Same value occurs at all points
Answer: a	
Evaluation	

Explanation:

This is due the behavior of the pdf of Normal distribution.

Ouestion 12

The shape of the normal curve depends on its (b) Standard deviation (a) Mean deviation (c) Ouartile deviation (d) None of these **Answer: b**

Explanation: This can be seen in the pdf on the normal distribution where standard deviation is a variable.

Question 13

The value of constant 'e' appearing in normal distribution is (b) 2.7836 (a) 2.5185

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(c) 2.1783Answer: cExplanation:This is a standard constant.

Question 14

In standard normal distribution, the value of median is

(a) 1 (c) 2

Answer: b

Explanation:

In a standard normal distribution the value of mean is 0 and in normal distribution mean, median and mode coincide.

Question 15

In a certain book, the frequency distribution of the number of words per page may be taken as approximately normal with mean 800 and standard deviation 50. If three pages are chosen at random, what is the probability that none of them has between 830 and 845 words each?

(b) 0

(d) Not fixed

(d) None of these

(a) 0.7536	(b) .7654
(c) .9084	(d) .8733
A	

Answer: a Explanation:

Let X be a normal variate which denotes the number of words per page. It is given that X - N (800, 50).

The probability that a page, select at random, does not have number of words between 830 and 845, is given by

$$1-P (830 < X < 845) 1 - P \left(\frac{830-800}{50} \le \le < \frac{845-800}{50}\right)$$

= 1 - P (0.6 < = < 0.9) = 1 - P (0< = < 0.9) + P (0< = < 0.6)
= 1 - 0.3159 + 0.2257 = 0.9098 = 0.91

Thus, the probability that none of the three pages, selected at random, have number of words lying between 830 and 845 = (0.91)3 = 0.7536.

Question 16

The distribution of 1,000 examines according to marks percentage is given below:

% Marks	less than 40	40-75	75 or more	Total
No. of examines	430	420	150	1000

Assuming the marks percentage to follow a normal distribution, calculate the mean and standard deviation of marks. If not more than 300 examines are to fail, what should be the passing marks?

(a) 30%

(c) 50%

(b) 40% (d) None

Answer: a

Explanation:

Let X denotes the percentage of marks and its mean and S.D. be m and s respectively. From the given table, we can write

P(x < 40) = 0.43 and $P(X \ge 75) = 0.15$, which can also be written as

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$P\left(=<\frac{40-\mu}{0}\right) = 0.43 \text{ and } P\left(=\geq \frac{75-\mu}{0}\right) = 0.15$	
The above equations respectively imply that	
$\frac{40-\mu}{\sigma}$ = -0.175 or 40 - μ = - 0.175 σ	(1)
And $\frac{75-\mu}{\alpha} = 1.04 \text{ or } 75 - \mu = 1.040^{\circ}$	(2)
Solving the above equations simultaneously, we get μ = 45.04 and O =	= 28.81
Let x, be the percentage or marks required to pass the examination.	
Then we have P (x < x ₁) = 0.3 or P (= $\frac{x_1 - 45.04}{28.81}$) = 0.3	
$\therefore \frac{x_1 - 45.04}{28.81} = -0.525 \rightarrow x_1 - 29.91 \text{ or } 30\% \text{ (approx)}$	

Question 17

At a petrol station, the mean quantity of petrol sold to a vehicle is 20 litres per day with a standard deviation of 10 liters. If on a particular day, 100 vehicles took 25 or more litres of petrol, estimate the total number of vehicles who took petrol from the station on the day. Assume that the quantity of petrol taken from the station by a vehicle is a normal variate.

(b) 343

(d) 567

(a) 333

(c) 324

Answer: c

Examination:

Let X denote the quantity of petrol taken by a vehicle. It is given that X – N (20, 10). ∴ P (X ≥ 25) = P (=≥ $\frac{25-20}{10}$) = P (= ≥ 0.5)

 $= 0.5000 - P(0 \le \le 0.5) = 0.5000 - 0.1915 = 0.3085$ Let N be the total number of vehicles taking petrol on that day. :. $0.3085 \times N = 100 \text{ or } N = \frac{100}{0.3085} = 324 \text{ (approx.)}$

Ouestion 18

Using the table areas under the standard normal curve, find the following probabilities: (i) P ($0 \le z \le 1.3$)

(ii) P ($-1 \le z \le 0$) (iii) P (-1 $\le z \le 12$) (a) 0 0.4032, 0.3413, 0.8185 (c) 0.40456, 0.3456, 0.8155

(b) 0.4072, 0.4413, 0.8185 (d) None

Answer: a

Explanation:

The required probability, in each question, is indicated by the shaded are of the corresponding figure.

(a) From the table.

(b) (i) we can write $P(0 \le z \le 1.3) = 0.4032$.

(c) (ii) we can write $P(-1 \le z \le 1)$, because the distribution is symmetrical.

Question 19

Determine the value or values of z in the following situations: (i) Area between 0 and z is 0.4495. (ii) Area between - ∞ to z is 0.1401. (a) -1.64, -1.08

(b) -1.08, -1.64

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(c) 1.64, 1.08 Answer: a Explanation:

(i) On locating the value of z corresponding to an entry of area 0.4495 in the table of areas under the normal curve, we have z = 1.64 we note that same situations may correspond to a negative value of z. Thus, z can be 1.64 or - 1.64.

(ii) Since the area between $-\infty$ to z<0.5, z will be negative. Further, the area between z and 0 = 0.5000 - 0.1401 = 0.3599. On locating the value of z corresponding to this entry in the table, we get z = -1.08

(d) -1.64, 1.08

PAST EXAMINATION QUESTIONS:

<u>MAY 2018</u>

Ouestion 1 The variance of a binomial distribution with the parameters n and p is: (a) $np^2(1-p)$ (b) nq(1-q)(d) $n^2 p^2 (1-p)^2$ (c) $\sqrt{np - (1 - p)}$ Answer: b **Explanation**: = npq = nqp = nq(1-q)**Ouestion 2** X is a passion variate satisfying the following condition 9 P(X = 4) + 90 (X = 6) = P (X = 2). What is the value of P (X \leq 1)? (b) 0.5655 (a) 0.5655 (c) 0.7358 (d) 0.8835 **Answer: c Explanation:** Given $X \sim P(m)$ $\frac{P(x = 2) = 9P(x = 4) + 90P(x = 6)}{\frac{e^{-m}.m^2}{2!} = +\frac{9.e^{-m}.m^4}{4!} + \frac{90.e^{-m}.m^e}{2!}}$ $\frac{90.e^{-m}.m^{e}}{2!} + \frac{9.e^{-m}.m^{4}}{4!} - \frac{e^{-m}.m^{2}}{2!} = 0$

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$e^{-m} \cdot m^2 \left[\frac{90 \cdot m^4}{6!} + \frac{9m^2}{4!} - \frac{1}{2!} \right] = 0$
$e^{-m} \cdot m^2 \left[\frac{90 \cdot m^4}{6!} + \frac{9m^2}{4!} - \frac{1}{2} \right] = 0$
$e^{-m} \cdot m^2 \left[\frac{90 \cdot m^4}{6!} + \frac{9m^2}{4!} - \frac{1}{2} \right] = 0$
$e^{-m} \cdot m^2 \left[\frac{m^4}{8} + \frac{3m^2}{8} - \frac{1}{2} \right] = 0$
$\frac{e^{-m}}{2} \left[\frac{m^4 + 3m^2 - 4}{4} \right] = 0$
$\frac{e^{m} \cdot m^2}{8} (m^4 + 3m^2 - 4) = 0$ $m^4 + 4m^2 - m^2 - 4 = 0$
$m^2 (m^2 + 4) - 1 (m^2 + 4) = 0$
$(m^2 + 4)(m^2 - 1) = 0$
If $m^2 + 4 = 0$ if $m^2 - 1 = 0$
$m^2 = -4$ if $m^2 = +1$
$m^2 = \neq \sqrt{1}$
m = (:: m > 0)
$P(x \le 1) = P(x = 0) + P(x = 1)$
$=\frac{e^{-1} \cdot 1^{0}}{0!} + \frac{e^{-1} \cdot 1!}{1!} = \frac{1}{e} + \frac{1}{e} = \frac{2}{e}$ $\frac{2}{2.7182} = 0.7358$
$\frac{2}{2.7182} = 0.7358$

Question 3

What is the first quartile of x having the following probability of function? f (x) $\frac{1}{\sqrt{72x}}e^{-(x-10)^{\frac{2}{72}}}$ for $-\infty < x < \infty$ (a) 4 (b) 5 (c) 5.95 (d) 6.75 Answer: c Explanation: Given: f (x) $\frac{1}{\sqrt{72x}}e^{-(x-10)^{\frac{2}{72}}}$ for $-\infty < x < \infty$ f(x) $\frac{1}{\sqrt{2x}}e^{-(x-10)^{\frac{2}{72}}}$ for $-\infty < x < \infty$ f(x) $\frac{1}{\sqrt{2x}}e^{-(x-10)^{\frac{2}{72}}}$ on company f (x) $\frac{1}{\sqrt{2x}}e^{\frac{-(x-\mu)^2}{2(o')^2}}$ For more Info Visit - www.KITest.in join our telegram channel @Ca foundation quiz group

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we get $0' = 6, \mu = 10$ First quartile $Q_1 = \mu - 0.6750^{\circ}$ $= 10-0.675 \times 6$ = 10-4.05= 5.95 **Ouestion 4** An example of bi-parametric discrete probability distribution is (a) Binomial distribution (b) Poisson distribution (c) Normal distribution (d) Both a and b Answer: d **Explanation**: Binomial distribution is an example of a bi- parametric discrete probability distribution. **Ouestion 5** Probability distribution may be (a) Discrete (b) Continuous (c) Infinite (d) a or b Answer: d **Explanation**: Probability distribution may be discrete or continuous. **Ouestion 6** If the area of standard normal curve between z = 0 to z = 1 is 0.3413, then the value of ø (1) is. (a) 0.5000 (b) 0.8413 (c) -0.5000 (d) 1 Answer: b **Explanation**: The area of standard of normal curve between z = 0 to z = 1 is 0.3413 then $\emptyset(1) = 0.3413 + 0.5$ 0.8413 **NOV 2018 Question 1** For a poisson variate X, P(X = 2) = 3P (X = 4), then the standard deviation of X is (b) 4 (a) 2 (d) 3 (c) $\sqrt{2}$ Answer: c

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Explanation: For Poisson Variate X, $\frac{e^{-m}m^2}{2!} = \frac{3e^{-m}m^4}{4!}$ $\frac{m^2}{2} = \frac{3m^4}{4!}$ $6m^4 = 24 m^2$ $m^2 = \frac{24}{6}$ $m^2 = 4$ m = 2S.D. = $\sqrt{m} = \sqrt{2}$

Question 2

The mean of the Binomial distribution B $(4, \frac{1}{3})$ is equal to (a) $\frac{3}{5}$ (b) $\frac{8}{3}$

(c) $\frac{3}{4}$ Answer: d Explanation: X 4 B (n, P) = B $\left(4, \frac{1}{3}\right)$ We get n = 4, P = $\frac{1}{3}$ Mean = np = 4 $\times \frac{1}{3} = \frac{4}{3}$

Question 3

If for a normal distribution Q_1 = 54.52 and Q_3 = 78.86, then the median of the distribution is

 $(d)\frac{4}{2}$

(a) 12.17 (b) 12.17 (c) 66.369 (d) None **Answer: c Explanation**: $Q_1 = 54.52$ and $Q_3 = 78.86$ We know that $Q_1 = \mu - 0.675 = 54.52$ (1) ____(2) $Q_3 = \mu - 0.675 = 78.86$ On adding $2\mu = 133.38$ $\mu = \frac{133.28}{2}$ $\mu = 66.69$ In normal distribution Mean, Median and mode are equal. For more Info Visit - www.KITest.in join our telegram channel @Ca foundation quiz group

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FOR ENQUIRY - 6262969604 6262969699 So, Median = Mean = 66.369 **Ouestion 4** What is the mean of X having the following density function? $F(X) = \frac{1}{\frac{4}{\sqrt{2x}}} e\left(\frac{x-10}{32}\right)^e \text{ for } -\infty < x < \infty$ (a) 10 (b) 4(c) 40(d) None Answer: a **Explanation:** Given Normal distribution $F(x) = \frac{1}{\sqrt[4]{2x}} e\left(\frac{x-10}{32}\right)^e \text{ for } -\infty < x < \infty$ On comparing from $f(x) = \frac{1}{\sqrt[4]{2x}} e\left(\frac{x-10}{32}\right)^e \text{for } -\infty < x < \infty$ on comparing from f (X) = $\frac{1}{\sqrt[\alpha]{2x}}e^{\frac{x-\mu}{2(0')^2}}$ we get Mean $(\mu) = 10$ 0' = 4<u>Ouestion 5</u> The probability that a student is not a Swimmer is $\frac{1}{5}$, then the probability that out of five student four are swimmer is (b) $5_{C_1} \left(\frac{1}{5}\right)^4 \left(\frac{4}{5}\right)^4$ (a) $\left(\frac{4}{5}\right)^4 \left(\frac{1}{5}\right)^4$ (c) $5_{c_4} \left(\frac{4}{5}\right)^1 \left(\frac{1}{5}\right)^4$ (d) None Answer: c **Explanation**: Given: Probability that a student is not a swimmer (q) = $\frac{1}{5}$ Probability that a student is a swimmer (P) = $1-q = 1-\frac{1}{5} = \frac{4}{5}$ Total No. of student (n) = 5P (Exactly 4 student are swimmer) = P(x=4) $5_{c_4} \left(\frac{4}{5}\right)^1 \left(\frac{1}{5}\right)^4 \{ \therefore P(x=n) = n_{c_{n,p^x}, q^{n-x}} \}$ **MAY 2019**

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<u>Question 1</u> If mean and variance are 5 and 3 respectively then relation	1 hetween n & a is
(a) $p > q$ (b) $p < q$	
(c) $p = q$ (d) p is symmetric	
Answer: b	
Explanation:	
If mean and variance are 5 and 3 respectively then relation bet	ween p & q is p < q
Question 2	
If $Y \ge x$ then mathematical expectation is	
(a) $E(X) > E(Y)$ (b) $E(X) \le E(Y)$	
(c) $E(x) = E(Y)$ (d) $E(X)$. $E(Y) = 1$	
Answer: b	
Explanation:	
$E(X) \le E(Y)$	
Question 3	
4 coins were tossed 1600 times. What is the probability the	at all 4 coins do not turn
head upward at a time?	
(a) $1600e^{-100}$ (b) $1000e^{-100}$ (c) $100e^{-1600}$ (d) e^{-100}	
Answer: d	
Probability of Head $= 1/2$	
Probability of not head = $1 - 1/2 = 1/2$	
probability that all 4 coins do not turn head upward at a time	
= 1 - Probability that 4 coins turn head upward at a time	
$= 1 - {}^{4}C_{4}(1/2)^{4}(1/2)^{0}$	
= 1 - 1/16	
= 15/16	
15/16 is the probability that all 4 coins do not turn head upwa	rd at a time
1600 * 15/16 = 1500	
1500 times all 4 coins do not turn head upward at a time	
Question 4	
In distribution, mean = variance:	
(a) Binomial (b) Poisson	
(c) Normal (d) None of these	
Answer: b	
Explanation:	
Poisson; np=npq	
Np = mean For more Info Visit - www.KITest.in	
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Npq = variance

Question 5							
In a Binomial Distribution, if p =	= a. then P(X = x) is given by						
(a) $n_{C_x}(0.5)^n$	(b) ${}^{n}C_{n}$ (0.5) n						
(c) ${}^{n}C_{x} p^{(n-x)}$	(d) ${}^{n}C_{n}p^{(n-x)}$						
Answer: a							
Explanation:							
If $p = q$, then $p = 0.5$							
Substituting in $P(x) = {}^{n}C_{x} p^{x}q^{(n-x)} w$	$re get {}^{n}C_{n} (0.5)^{n}.$						
<u>NOV 2019</u>							
Question 1							
<u>Question 1</u> Area under U = 30'							
(a) 99.73%	(b) 99%						
(c) 100%	(d) 99.37%						
Answer: a							
Explanation:							
(a) We know that 99.37 percent of the values of a normal variable lies between (u - 30')							
and (u + 30').							
Thus probability that a value of x	lies. Outside the limit is as low as						
(100 - 99.73) = 0.27%							
Question 2							
For a Poisson distribution:							
(a) mean and SD are equal	(b) mean and variance are equal						
(c) SD and Variance	(d) Both a and b						
Answer: b							
Explanation:							
(b) Poisson distribution is theoret	ical discrete probability distribution which can						
describe many processes							
Mean is given by m i.e. U = m							
Variance is also given by m i.e. o ² :							
So in pass on distribution mean an	nd variance are equal.						
Question 3							
Find mode when n = 15 and p =	$\frac{1}{4}$ in binomial distribution?						
(a) 4	⁴ (b) 4 and 3						
(c) 4.2	(d) 3.7						
Answer: b							
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Explanation:

(b) In binomial distribution, m = (n + 1) p $m = (15 + 1) \times \frac{1}{4}$ m = 4Since 4 is a integer so there will 2 modes 4 and (4 - 1) Mode = 4 and 3

Question 4

In Poisson distribution, if P (x = 2) = $\frac{1}{2}$ p (x = 3) find m? (b) $\frac{1}{6}$ (d) $\frac{1}{3}$ (a) 3 (c) 6Answer: c **Explanation:** (c) In Poisson distribution $P(x = x) = \frac{e^{-m} m^2}{x!}$ Here P (x = 2) = $\frac{1}{2}$ P(x = 3) $\frac{e^{-m} m^2}{2!} = \frac{1}{2} \times \frac{e^{-m} m^3}{3!}$ $\frac{e^{-m} \cdot m^2}{2!} = \frac{1}{2} \times \frac{e^{-m} \cdot m^3}{3!}$ $\frac{m^2}{2} = \frac{1}{2} \times \frac{m^3}{6}$ $m^2 = \frac{2}{12} = \frac{1}{6}m^3$ $m^{-1}\frac{1}{6}$ $\frac{1}{m} = \frac{1}{6} = m = 6$ **Question 5** In a binomial distribution B(n, p) $n = 4 P(x = 2) = 3 \times P(x = 3)$ find P (a) $\frac{1}{3}$ (b) $\frac{2}{3}$ (d) $\frac{4}{3}$ (c) ⁶ Answer: a

Explanation:

We know $P(x = 1) = {}^{n}C_{r}(p)^{r}(q)^{n-r}$

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Here p(x = 2) = 3 P(x = 3) $4_{c_2}(p)^2(q)^{4-2} = 3 \times {}^4c_3(p)^3(q)^1$ $\frac{4!}{(4-2)1\times 2!}(p)^2 \left(1-p^2=3\times \frac{4!}{(4-3)1\times 3!}\times (p)^3 (1-p)\right)$ Since ${}^{n}C_{r} = \frac{n!}{(n-r)!1 \times r!}$ $6 \times (1 - p) = 3 \times 4 p$ 6 - 6p = 12p18 p = 6 $P = \frac{1}{3}$ $q=1-\frac{1}{3}=\frac{2}{3}$ What is the SD and mean X if f(x) = $\frac{\sqrt{2}}{\sqrt{\pi}} \cdot e^{\frac{x-\mu}{20'^2}}$ (1)Here, $\sqrt{\frac{2}{\pi}} \cdot e^{-2}(x-3)^2$ $=\sqrt{\frac{2}{\Pi}} \cdot e - \left(\frac{1-3}{\frac{1}{2}}\right)^2$ On comparing with equation ------ (1) $2 0^2 = \frac{1}{2}u = 3$ $0^2 = \frac{1}{2}$ $0 = \frac{1}{2}$ So SD = $\frac{1}{2}$, mean = 3

DEC 2020

Question1Which of the following is uni-parametric distribution?(a) Normal(b) Poisson(c) Binomial(d) Hyper geometricAnswer: bExplanation:Poisson distribution is uniparametric distribution. the parameter is m which is mean=np

Question2

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(c) Has two modes	(d) Has median at a point > mean +
	1/2
Answer: b	
Explanation:	
Is skewed to right	
Question3	
If we change the parameter(s) of a _	distribution the Sharpe of probability
curve does not change.	
(a) Binomial	(b) Normal
(c) Poisson	(d) Non – Gaussian
Answer: b	
Explanation:	
	rmal distribution the Sharpe of probability curve
does not change.	
Question4	
Which one of the following has Pois	son distribution?
(a) The number of days to get a	(b) The number of defects per meter
complete	on
cure	Long rollOf coated polythene sheet.
(c) The errors obtained in repeated	
Measuring of The length of a rod.	by an
	Insurance agency.
Answer: b	
Explanation:	
The number of defects per meter on lo	ong roll of coated polythene sheet.
Question5	
	X, we hve $P(X = 7) = 8$. $P(X = 9)$, the mean of the
distribution is	
(a) 4	(b) 3
(c) 7	(d) 9
Answer: b	
Explanation: $17e^{-\lambda}$ $919e^{-\lambda}$ 01	
$P(X = n) = \frac{\lambda^7 e^{-\lambda}}{7!} = \frac{8 \cdot \lambda^9 e^{-\lambda}}{9!} \frac{9!}{7! \times 8} \lambda^2$	2
$\lambda = 3$ 7! 9! 7! × 8	
$\Lambda - 3$	
Question6	
	listribution with mean 10 and standard
deviation 4 is	and and and and and standard
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(a) 54.24 (c) 0.275 Answer: d Explanation: In normal distribution, quartile deviati	(b) 23.20(d) 2.70on is related to standard deviation as
Q.D. = 0.675σ Q.D. = 0.675×4 Q.D. = 2.70 Therefore, quartile deviation is 2.70. Question7	
If the parameter of poison distributi	on is m and (mean + S.D.= 25 6 then find m.
(a) $\frac{3}{25}$ (c) $\frac{4}{25}$ Answer: b	(b) $\frac{1}{\frac{25}{5}}$ (d) $\frac{3}{5}$
Explanation:	
Let, Mean of the Poisson distribute =µ For a Poisson distribution,	
Standard Deviation (SD)= \sqrt{mean}	
\Rightarrow SD= $\sqrt{\mu}$	
Mean+SD= $\frac{6}{25}$ (Given) $\mu + \sqrt{\mu} = \frac{6}{25}$ $\Rightarrow \sqrt{\mu} = \frac{6}{25} - \mu$	
$\mu + \sqrt{\mu} = \frac{6}{25}$	
$\Rightarrow \sqrt{\mu} = \frac{\sigma}{25} - \mu$ On squaring both sides,	
$(\sqrt{\mu})^2 \left(\frac{6}{25} - \mu\right)^2$	
$\mu = \mu^2 - \frac{12}{25}\mu + \frac{36}{625}$	
$\Rightarrow 0 = \mu^2 - \frac{37}{25}\mu + \frac{36}{625}$	
$\Rightarrow 0 = \left(\mu - \frac{1}{25}\right) \left(\mu - \frac{36}{25}\right)$ $\Rightarrow \mu = \frac{1}{25}, \frac{36}{25}$	
Maximum likelihood estimate of a samy which is equal to parameter of Poisson	ple from Poisson Distribution is the sample mean 's Distribution.
$\Rightarrow \mu = m = \frac{1}{25}$ $\therefore \text{ The correct option is B} \frac{1}{25}$	
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<u>JAN 2021</u>

Question1	
If X is a poisson variable, and P (X = 1	= P(X = 2), then $P(X = 4)$ is
(a) $\frac{2}{3}e^2$ (c) $\frac{3}{2}e^2$	(b) $\frac{2}{2}e^4$
$(c) \frac{3}{2}a^2$	(b) $\frac{2}{3}e^4$ (d) $\frac{3}{2}e^4$
2	$\left(u \right) \frac{1}{2} e$
Answer: a	
Explanation:	
$P(x;\mu) = \frac{c - \mu}{v!}$	
$P(x; \mu) = \frac{e^{-u}\mu^{x}}{x!}$ $P(X = 1) = P(X = 2)$	
$e^{-u}\mu^1 e^{-u}\mu^2$	
$\frac{e^{-u}\mu^1}{1!} = \frac{e^{-u}\mu^2}{2!}$	
$\mu = 2$	
$\mu = 2$ $P(X = 4) = \frac{e^{-u}\mu^{x}}{4!} = \frac{2}{3}e^{2}$	
$P(x - 4) = \frac{1}{4!} = \frac{1}{3}e^{-\frac{1}{3}}$	
Question2	and the distribution 2
Which one of the following is an unipa	
(a) Poisson (c) Binomial	(b) Normal (d) Hyper geometric
Answer: a	(u) Hyper geometric
Explanation:	
Poisson distribution is uniparametric dis	stribution. The parameter is m which is
mean=np. Bcz it has λ as a parameter.	Å
Question3	
For a normal distribution, the value o	
(a) 0	(b) 1
(c) 2	(d) 3
Answer: a	
Explanation: $F[(X_{-u})_{3}]=0$ since X_{-u} is normally distributed by $F[(X_{-u})_{3}]=0$	buted with mean zero, then expand out the
cube. If the distribution of a random vari	
	s third moment, if it exists at all, must be 0, as
must all of its odd-numbered moments.	

<u>JULY 2021</u>

Question1

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The value	of K for	the prob	ahility de	nsity fun	ction of a	variate X	is equal to
X	0	1	2	3	4	5	6
P (X)	5 5K	3K	4K	6K	7K	9K	11K
(a) 39				(b) 1	/40		
(c) 1/49					/45		
Answer: (Options (c)					
Explanati							
Note: - Su	*						
	, 5K + 3K +	+ 4k + 6k	: + 7k + 9k +	+11k = 1			
∴k=149							
Question	2						
-		iate sucl	n that I (x =	= 1) = 0.7,	P (x =2)	= 0.3, the	n P (x =0) =
(a) e ^{6/7}				(b) e			
(c) e ^{-2/3}				(d) e	-1/3		
Answer: (Options (b)					
Question	3						
-		ariate w	vith n = 1/3	3 for. the	experime	ent of 90 t	rials, then th
standard							
(a) $-\sqrt{5}$		•		(b) √	5		
(c) $2\sqrt{5}$				(b) √ (d) √	15		
Answer: (Options (c)					
Question		- C 1- 11		- 11 - C 12 -	1		(.)
				-		_	s of the batte viation of 15
							e probability
							() = 0.9082, (
0.5)							
(a) -0.408				(b) (
(c) 0.408				(d) -	0.5		
Answer: (-	c)					
Explanati	on:						
Given,							
$\mu = 50 (means of the second seco$		viation)					
$\sigma = 15$ (stan find the pr			z<70				
<u> </u>			tandard for	m			
$Z = \frac{(x-\mu)}{2}$	o the prot						
- σ							
for x=50,			For more la	ofo Vicit	ww.KlTest.i	n	
		• •					1
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Z=0

For x=70. Z= (70-50)/15=1.33 For finding the probability for 50<x<70 In the standard form 0<z<1.33 using Z-table, the area is equal to 0.4082 **DEC 2021 Ouestion 1** The average number of advertisements per page appearing in a newspaper is 3. What is the probability that in a particular page zero (a) e^{-3} (b) e^{-1} (c) e^{3} (d) e^0 Answer: a **Explanation**: Given m = 3; x = 0As per Poisson Distribution, $P(x) = \frac{e^{-m}m^x}{x!}$ $P(x = 0) = \frac{e^{-3}m^0}{0!} = e^{-3}$ **Ouestion 2** Four unbiased coins are tossed simultaneously. The expected number of heads is: (a) 1 (b) 2(c) 3 (d) 4Answer: b **Explanation:** Since four coins are being tossed, we have n = 4. Probability of getting a "heads" in each trial (p) = $\frac{1}{2}$ Expected number of Heads = $np = 4 \times \frac{1}{2} = 2$. **Ouestion 3** If, for a Poison distributed random variable X, the probability for X taking value 2 is 3 times the probability for X taking value 4, then the variance of X is (a) 4 (b) 3(c) 2 (d) 5Answer: c **Explanation:** Poisson Distribution, $P(x) = \frac{e^{-m}m^x}{x!}$ P(x = 2) = 3P(x = 4)

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 $\frac{e^{-m}m^2}{2!} = 3 \times \frac{e^{-m}m^4}{4!}$ $\frac{1}{2} = \frac{3m^2}{24}$ $\frac{6m^2}{24} = 1$ $m^2 = \frac{24}{6} = 4$ $m = \sqrt{4} = 2$

Question 4

Let X be normal distribution with mean 2.5 and variance 1. If P[a < X< 2.5] = 0.4772 and that the cumulative normal probability value at 2 is 0.9772, then a =? (a) 0.5 (b) 3

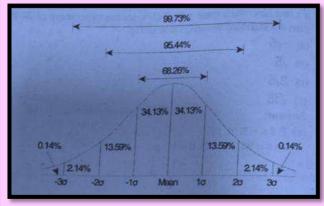
(c) -3.5 (d) -4.5

Answer: a Explanation:

We know that for a standard normal deviate, $z = \frac{x-\mu}{x}$

Therefore, for × = 2.5, $z = \frac{2.5 - 2.5}{1} = 0$

Therefore, we need the area of 0.4772 from the mean till a certain point on the left-hand side.



From the graph above, we can see that the area from mean till -2 σ is 47.72%, i.e., 0.4772.

Thus, the corresponding z for the value of x = a should be -2.

Therefore, $-2 = \frac{a-2.5}{1}$ = -2 = a - 2.5= 2.5 - 2 = a= a = 0.5

Question 5 The manufacturer of a certain electronic component is certain that 2% of his For more Info Visit - www.KITest.in

FOR ENQUIRY - 6262969604 6262969699 product is defective. He sells the components in boxes of 120 and guarantees that not more than 2% in any box will be defective. Find the probability that a box, selected at random would fail to meet the guarantee? (Given that $e^{-2.4} = 0.0907$) (b) 0.39 (a) 0.49 (c) 0.37 (d) 0.43Answer: d **Explanation:** Here, n = 120; p = 2/100 = 0.02 $m = np = 120 \times 0.02 = 2.40$ As per Poisson Distribution, $P(x) = \frac{e^{-m}m^x}{x!}$ A box, selected at random would fail to meet the guarantee if more than 2.40 components turn out to be defective. $P(x > 2.40) = 1 P(x \le 2.40)$ P(x > 2.40) = 1 - [P(x = 0) + P(x = 1) + P(x = 2)] $P(x > 2.40) = 1 - \left[\frac{e^{-240}.(2.40)^2}{0!} + \frac{e^{-240}.(2.40)^2}{1!} + \frac{e^{-240}.(2.40)^2}{2!}\right]$ $P(\times > 2.40) = 1 - \left[\frac{0.0907 \times 1}{1} + \frac{0.0907 \times 2.40}{1} + \frac{0.097^{-240} \cdot (2.40)^2}{2}\right]$ P(x > 2.40) = 0.43**Ouestion 6** A renowned hospital usually admits 200 patients everyday. One percent patients, on an average, require special room facilities. On one particular morning, it was found that only one special room is available. What is the probability that more than 3 patients would require special room facilities? (b) 0.1732 (a) 0.1428 (c) 0.2235 (d) 0.3450 Answer: a **Explanation:** Here n = 200; p = 1/100

Therefore, m = np = $200 \times 1/100 = 2$ As per Poisson Distribution, P(x) = $\frac{e^{-m}m^x}{m}$

$$P(x > 3) = 1 - P(x \le 3)$$

$$P(x > 3) = 1 - [P(x = 0) + P(x = 1) + P(* = 2) + P(x = 3)]$$

$$P(x > 3) = 1 - \frac{e^{-2} \times 2^{0}}{0!} + \frac{e^{-2} \times 2^{1}}{1!} + \frac{e^{-2} \times 2^{2}}{2!} + \frac{e^{-2} \times 2^{3}}{3!}$$

$$P(x > 3) = 1 - \frac{271828^{-2} \times 2^{0}}{0!} + \frac{271828^{-2} \times 2^{1}}{1!} + \frac{271828^{-2} \times 2^{2}}{2!} + \frac{271828^{-2} \times 2^{3}}{3!}$$

$$P(x > 3) = 1 - \frac{1}{271828^{2}} + \frac{2}{271828^{2}} + \frac{4}{2 \times 271828^{2}} + \frac{8}{3 \times 271828^{2}}$$

$$P(x > 3) = 1 - \left[\frac{1}{(2.71828)^{2}} \left\{1 + 2 + \frac{4}{2} + \frac{8}{6}\right\}\right]$$

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P(x > 3) = 1 - [0.8571] = 0.1428**IUNE 2022 Ouestion 1** If Standard Deviation is 1.732 then what is the value of poisson distribution. The P [-2.48 < × < 3.54] is (a) 0.73 (b) 0.65 (c) 0.86 (d) 0.81 Answer: b **Explanation**: Given S.D = 1.732 S.D. = $\sqrt{3}$ In Poison distribution S.D. = \sqrt{m} $\sqrt{3} = \sqrt{m}$ m = 3= P(x = 0) + P(x = 1) + P(x = 2) + P.(x = 3) $\left[\frac{e^{-3} \cdot 3^{0}}{0!} + \frac{e^{-3} \cdot 3^{1}}{1!} + \frac{e^{-3} \cdot 3^{2}}{2!} + \frac{e^{-3} \cdot 3^{3}}{3!}\right]$ $e^{-3}\left[\frac{1}{0!} + \frac{3}{1!} + \frac{9}{2!} + \frac{27}{3!}\right]$ $e^{-3}\left[1 + 3 + \frac{9}{2} + \frac{27}{6}\right]$ $\frac{1}{\rho^3}$ |1 + 3 + 4.5 + 4.5| $=\frac{1}{(2.72)^3}=\frac{13}{20.12}=0.6461=0.65$ <u>Ouestion 2</u> In a normal distribution, variance is 16 then the value of mean deviation is. (b) 3.2 (a) 4.2 (c) 4.5 (d) 2.5 **Answer: b Explanation:** Variance = 16 (In Normal Distribution) $S.D = \sqrt{16} = 4$ M.D = 0.8 S.D $= 0.8 \times 4 = 3.2$ **Question 3**

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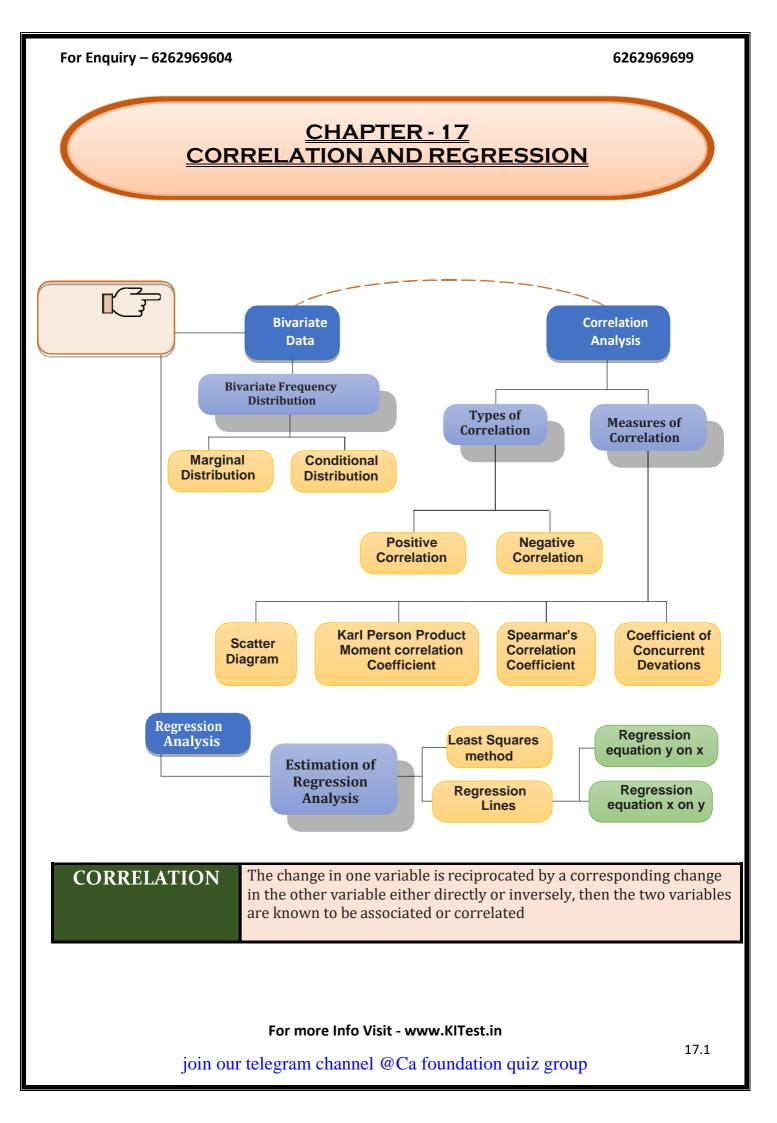
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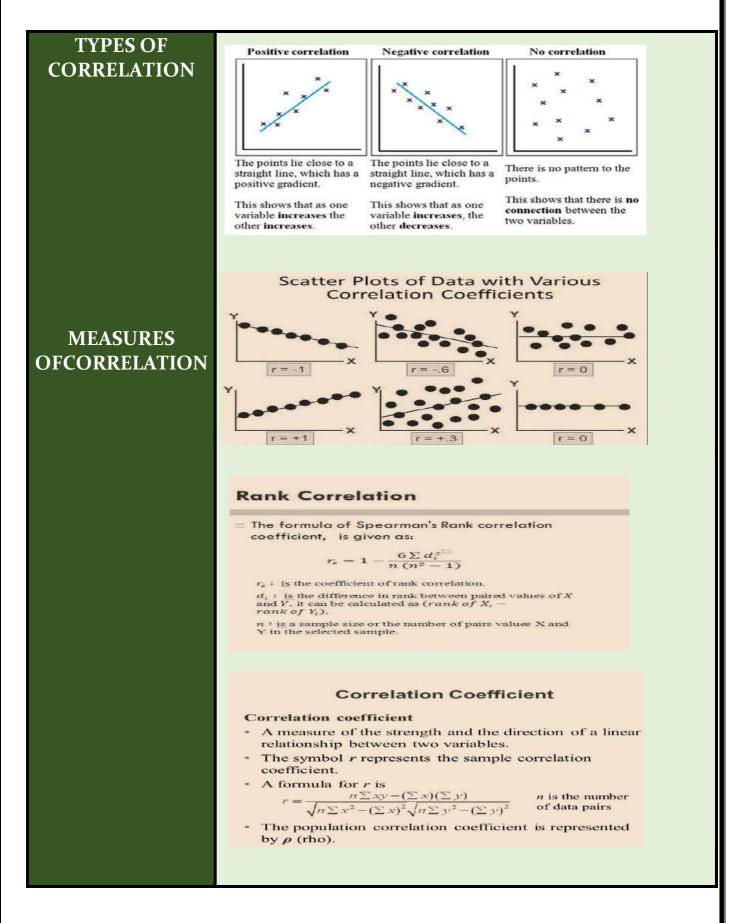
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For a binomial distribution, the	ere may be
(a) One mode	(b) Multi mode
(c) Two mode	(d) No mode
Answer:	
Explanation:	
a For a binomial distribution, ther	e may be multimode.
	<u>DEC 2022</u>
<u>Question 1</u>	
Skewness of Normal Distribution	on is
a) Negative	b) Positive
c) zero	d) Undefined
Answer: Options (c)	
Explanation:	
	oution is zero, and any symmetric data should have a
	ues for the skewness indicate data that are skewed left
	ess indicate data that are skewed right. By skewed left,
-	elative to the right tail. Similarly, skewed right means
	o the left tail. If the data are multi-modal, then this may
affect the sign of the skewness.	
<u>Ouestion 2</u>	
If a Poission distribution in suc	h that P(X=2)=P(X=3) than the variance of the
distribution is	
a) $\sqrt{3}$	b) 3
c) 6	d) 9
Answer: Options (b)	
Explanation: Mean =? Variance =?	
$P(X = x) = \frac{e^{-\lambda} \lambda^x}{x!}$	
P(x = 2) = P(X = 3) X = 2	
$\frac{e^{-\lambda}\lambda^2}{2!} = \frac{e^{-\lambda}\lambda^3}{3!}$	
$\frac{1}{2} = \frac{\lambda}{3 \times 2}$	
$\lambda = 3$	
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Question 3		
The standard Deviation o	Binomial distribution is	
a) npq	b) √npq	
c) np	d) \sqrt{np}	
Answer: Options (b)		
Explanation:		
	random variable, sample, statistical population, da the square root of its variance.	ata set
μ = np, which signifies the σ^2 = npq , σ^2 is the variance	pected number of successes.	
	n is the square root of the variance,	
Therefore, σ = Standard de		
	on for a binomial probability distribution is gi	ven
by√npq.		
	variable 'x' is 17, then what is variance of y =	2x + 5?
a) 34	b) 39	
c) 68	d) 78	
Answer: Options (c) Explanation: Var(X)=17 Var (2X+5)=(2) ² Var(X) Var(2X+5)=4×17 Var(2X+5)=92		

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POINT TO SIGNIFY	The 'coefficient of non-determination' is given by $(1-r^2)$ and can be interpreted as the ratio of unexplained variance to the total variance. The two lines of regression coincide i.e. become identical when $r = -1$ or 1 or in other words, there is a perfect negative or positive correlation between the two variables under discussion. If $r = 0$ Regression lines are perpendicular to each other The two lines of regression intersect at the point, where x and y are the variables under consideration Thereaggressioncoefficientsremainunchangedduetoashift oforiginbutchangeduetoa shift of scale.



Question 1

The table below show the height, x, in inches and the pulse rate y, per minute for 9 people find the correlation coefficient and interpret your result.

Λ 0	58	72	65	70	62	75	78	64	68
Y 9	0	85	88	100	105	98	70	65	72

(a) 0.69 (c) 0.15 (b) 0.56 (d) None For more Info Visit - www.KITest.in

Answer: c Explanation:

You may the use the fact that (double check this for practice) $\sum x = 622' \sum y = 773, \sum x^2 = \sum y^2 = 68.007, \sum x y = 53,336$ Calculate the numerator $x^2 = 43206$ $y^2 = 68007$ $n\sum (xy) - (\sum x)(\sum y) = 9.53336 - 622.773 = -782$ $\sqrt{n \sum x^2 - (\sum x)^2} \sqrt{n \sum y^2 - (\sum y)^2}$ $= \sqrt{9.43206 - (622)^2} \cdot \sqrt{9.68007 - (773)^2}$ $= \sqrt{1970} \cdot \sqrt{14534} = 5350.89$ Now, divide to get $r = \frac{-782}{5350.89} = 0.15$

Question 2

In the previous problem the researcher decides to use data only for adults age 21 to 60 to compute a correlation coefficient what value of r should he expect?

(a) $r = 0$	(b) r ≠ 0
(c) r < 0	(d) r > 0

Answer: a

Explanation:

r = 0. It is unexpected that mathematical ability and shoe size varies together

Question 3

The following data relate to the test scores obtained eight salesmen in an aptitude test and their daily sales in thousands of rupees:

	1	2	3	4	5	6	7	8
Scores	60	55	62	56	62	64	70	54
Sales	31	28	26	24	30	35	28	24

(a) 48	(b) 56
(c) 4.5	(d) 0.48

Answer: d

Explanation:

As

 $b = \frac{24+35}{2} = 30$

Scores (xi)	Sales in	ui=xi =62	Vi = yi – 30	Ui vi	$(6) = (U i)^2$	$(7) (Vi)^2$
(i)	1000(yi)	(3)	(4)	$(5)=(3)\times(4)$		
	(2)					
60	31	-2	1	-2	4	1
55	28	-7	-2	14	49	4
62	26	0	4	0	0	16
56	24	-6	-6	36	36	36
62	30	0	0	0	0	0
64	35	2	5	10	4	25
70	28	8	-2	-16	64	4

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54	24	-8	6	48	64	36
Total	1	-13	-14	90	221	122

(d) 0.7

Since correlation coefficient remain unchanged due to change of origin we have

Ouestion 4

If r = 0.7; and n = 64 find out the probable error of the coefficient of correlation. (b) 0.43

(a) 0.043 (b) 0.747, 0.657 Answer: a **Explanation**: r = 0.7: n = 64P.E. = $0.67745 \times \left[\frac{1-r^2}{\sqrt{n}}\right]$ Probable Error (P.E) = $0.6745 \times \frac{1-(0.7)^2}{\sqrt{64}}$ $= (0.6745) \times (0.06375)$ = 0.043

Ouestion 5

Compute the probable error assuming the correlation coefficient of 0.8 from a sample of 25 pairs of item

> (b) 0.0456 (d) 0.0789

(a) 0.0486 (c) 0.0567 Answer: a **Explanation**:

r = 0.8. n = 25

P.E. = 0. 6745 $1-(0.8)^2$ $\sqrt{25}$ $= 0.6745 \times 0.07 = 0.0486$

Ouestion 6

Difference between Correlation and Causation

other so that neither can be called the causes of other

(c) Pure change correlation

(a) The variable mutually influence each (b) The correlated variables are influenced By one or more variables.

Answer: d **Explanation**:

The term correlation should not be misunderstood as causation if correlation exists between two variables it must not be assumed that a changed in one variable is the cause of a change in over variable.

(d) All

Question 7

For some bivarilate data the following result were obtained the two variable X and Y: x = 53.2, y = 27.9 bvx = -1.5 bxy = -0.2The most probable value of y when x = 60 is (a) 15.6 (b) 13.4 (c) 19

9.7	(d) 17.7

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Answer: d Explanation: The regression equation of y of x is: y - y = by x (x-x)= y - 27.9 = (-1.5) (x - 53.2)Or y = 107.7 - 1.5xWhen x = 60 then $y = 107.7 - 1.5 \times 60 = 17.7$

Question 9

If the sum of square of the rank difference in mathematics and physics marks of 10 students is 22, then the coefficient of rank correlation is:

(a) 0.267 (b) 0.867 (c) 0.92 (d) None Answer: b

Explanation:

Co. efficient of rank correlation $\sqrt{\Sigma d^2}$

 $1 - \frac{6\sum d^{2}}{n(n^{2} - 1)}$ $1 - \frac{6\times 22}{10(10^{2} - 1)}$ $1 - \frac{6\times 2}{10\times 9}$ $\frac{13}{15} = 0.867 \text{ (Approx.)}$

Question 10

The coefficient of correlation r between x and y when: Cov(x, y) = -16.5, Var(x) = 2.89, Var (y) = 100 is: (a) -0.97 (b) 0.97 (c) 0.89 (d) - 0.89 Answer: a **Explanation**: $r = \frac{Cov(x,y)}{x}$ $\sigma_x \sigma_y$ *Cov* (*x*,*y*) Or r = $\frac{1}{\sqrt{vary(x) - vary(y)}}$ -16.5 $\sqrt{2.89 \times 100}$ = - 0.97 **Ouestion11** Two random variable have the regression line 3x + 2y = 26 and 6x + y = 31. The coefficient of correlation between x and y is: (a) -0.25 (b) -0.5 (c) 0.5 (d) 0.25Answer: c **Explanation**: The regression lines 3x + 2y = 26 and 6x + y = 31 are given Let first equation be y on x sand second be x only respectively therefore, 3x + 2y = 26

$$=\left(\frac{-3}{2}\right)x + 26$$

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 $\therefore byx = -3/2$ and 6x + y = 31 $= x = \left(\frac{-1}{6}\right)x + \left(\frac{31}{6}\right)$ by = -1/6 Now $r^2 byx. bxy$ $= \left(\frac{-3}{2}\right) \times \left(\frac{-1}{6}\right)$ = 0.25 r= 0.5 Hence, our assumption hold true hold and r = 0.5 (-1 r 1) Note r is negative because byx and bxy = 0

Question 12

The coefficient of correlation between X and Y is 0.6 U and V are two variable defined as $U = \frac{x-3}{2}, V = \frac{y-2}{3}$, then the coefficient of correlation between U and V is:

(a) 0.6	(b) 0.8
(c) 0.4	(d) 1

Answer: a

Explanation:

Since correlation coefficient (Karl Pearson`s) is independence of both scale and origin therefore,

p(u,v) = p(x,y) = 0.6it may be noted that if μ , = ax, + b and V; = CY; + d then r (u,v) = P (x,y) if a and c are of same signs P (x,y) if a and c are of opposite sing

Question 13

For the following data the coefficient of rank correlation is:

Rank in Botany	1	2	3	4	5
Rank in Chemistry	2	3	1	5	4

0.4 None

		(b)
		(d)

(c) 0.6 **Answer: c**

(a) 0.93

Explanation:

S No.	Rank in Botany(xi)	Rank in Chem (yi)	d = (xi) - (yi)	d ²
1	1	2	-1	1
2	2	3	-1	1
3	3	1	2	4
4	4	5	-1	1
5	5	4	1	1
Total			0	8

Hence coefficient of rank correction

 $1 - \frac{6 \times 8}{5 (5^2 - 1)}$ $S = 1 - \frac{2}{5} = 0.6$

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Question 14 The following data is given on 450 students for marks is statistics and Economic at a certain examination **Mean marks in statistics** = 40 = 48 Mean marks in economics S.D. of marks (statistics) = 12 Variance of marks (Economics) = 256 Sum of the products of deviation of Marks from their respective mean = 42075 The average marks in economics of candidates who obtained 50 marks in statistics is: (a) 45 (b) 54 (c) 54.5 (d) 47.5 **Answer: c Explanation**: Let x = marks statistics and v = marks in Economics we know that $\Gamma_{xy} = \sum \frac{(\sum dx \times dy)}{n \times \sigma_x \sigma_y}$ Where dx = $x_1 \cdot \bar{x}$ and dy = $y_1 \cdot \bar{y}$ $r_{xy} = \frac{(42075)}{450 \times 12 \times 16} = 0.49$ Now regression equation of y on x $y - \overline{y} = \frac{r \overline{o}_{y(x - \overline{x})}}{r \overline{o}_{y(x - \overline{x})}}$ $y - y = \frac{\sigma_x}{\sigma_x}$ = y - 48 = $\times \frac{0.49 \times 16}{12}$ (x-40) \rightarrow Y = 0.65 + 22 When x = 50, then y = 0.65 + 22 When x = 50, then v = 0.65x + 50 + 22 = 54.5

Question 15

For 10 pair of observation, number of concurrent deviation was found to be 4. what is the value of the coefficient deviation?

(a) $\sqrt{0.2}$ (b) $-\sqrt{0.2}$ (c) 1/3 (d) -1/3 **Answer: d Explanation:** Here C = 4, N = 10, So n = N -1 = 10 - 1 = 9 $rc = \pm \sqrt{\frac{\pm (2_{c-n})}{n}}$ $rc \pm \sqrt{\pm \frac{(2 \times 4 - 9)}{9}}$ Here (2_c - n) is negative so negative sign is take at both the place so rc = (-1)/3

Question16 Karl Pearson`s formula:

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(a) $\frac{[N \sum XY - (\sum X)[(\sum Y)]}{\sqrt{[N \sum X^2 - (\sum X^2)]}}$ (c) Either a or b **Answer: b Explanation**: $\mathbf{r} = \frac{n(\sum xy) - (\sum X)(\sum Y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$ Where N = number of pairs of scores $\sum xy = sum or the products or paired scores$ $\sum x = sum of x scores$ $\sum y = sum of y scores$ $\sum x^2$ = sum of squared x scores $\sum y^2$ = sum of squared y scores

(b) $r = \frac{n(\sum xy) - (\sum X)(\sum Y)}{\sqrt{[n \sum x^2 - (\sum x)^2][n \sum y^2 - (\sum y)^2]}}$ (d) None

Ouestion 17

If the coefficient of correlation between x and Y variable is +0. 90 then what will be coefficient of determination?

(b) 0.81

(d) None of these

(a) 0.39 (c) 0.94 **Answer: b Explanation**: If Coeff. of Correlation $\mathbb{R} = 0.90$ Coeff.of Determination = r^2 $= (0.90)^2$ = 0.81

Ouestion 18

The two lines of regression become identical when (b) 0.6 (a) 0.4(c) 0.36 (d) 0.64**Answer: c Explanation**: If r = 0.6Then Coeff, of determination = r^2 $= (0.6)^2$ = 0.36

Question 19

There two regression lines passing through

(a) Represent means (b) Represent S. Ds (c) (a) and (b) (d) None of these Answer: a

Explanation:

The two regressions lines passing through or (Intersect) at their means.

Question 20

The regression equation x and y is 3x + 2y = 100 value of b_{xy} (b) $-\frac{3}{2}$

(a) $-\frac{2}{3}$

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(c)
$$\frac{2}{3}$$
 (d) $\frac{100}{2}$
Answer: a
Explanation:
The regression equation of x & y is
 $3x + 2y - 100 = 0$
 $b_{xy} = \frac{0.000}{0.000}$ (d) $3x + 2y - 100 = 0$
 $b_{yy} = \frac{0.000}{0.000}$ (e) 0.73
(c) 0.80 (d) 0.60
Answer: b
Explanation:
Sum of squares of difference of rank (ydz) = 44
ref?
ref = $1 - 6\frac{ydz}{y(x^{2}-1)}$
 $1 - \frac{6x44}{10(x^{2}-1)}$
 $2 - \frac{2}{x^{2}}$
 $3 - \frac{2}{x^{2}}$
 $2 - \frac{2}{x^{2}}$
The coefficient of correlation between x and y is 0.6 If x and y value are multiplied by 1
then the coefficient will be
(a) 0.6 (b) $1 - 0.6$
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 $2 - 10 - 2$

(c) 1/0.6 (d) -0.6 Answer: a Explanation: The coefficient of correlation between X and Y is 0.6 If x and y values are multiplied by 1 then coefficient remains unchanged then are coefficient of correlation will be 0.6 Question 24 The coefficient of correlation between the temperature of environment and power consumption is always: (a) +ve (b) - ve (c) 0 (d) = 1 Answer: a Explanation: The coefficient of correlation between the temperature of environment and power
Answer: a Explanation: The coefficient of correlation between X and Y is 0.6 If x and y values are multiplied by 1 then coefficient remains unchanged then are coefficient of correlation will be 0.6 Question 24 The coefficient of correlation between the temperature of environment and power consumption is always: (a) +ve (b) - ve (c) 0 (d) = 1 Answer: a Explanation: The coefficient of correlation between the temperature of environment and power
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 (a) +ve (b) - ve (c) 0 (d) = 1 Answer: a Explanation: The coefficient of correlation between the temperature of environment and power
(c) 0 (d) = 1 Answer: a Explanation: The coefficient of correlation between the temperature of environment and power
Answer: a Explanation: The coefficient of correlation between the temperature of environment and power
Answer: a Explanation: The coefficient of correlation between the temperature of environment and power
Explanation: The coefficient of correlation between the temperature of environment and power
The coefficient of correlation between the temperature of environment and power
consumption is always positive.
Question 25
Out of the following the one which the regression coefficient is
(a) Change origin only (b) Change of scale only
(c) Change of scale and origin both (d) Neither a nor b
Answer: b
Explanation:
By shifting the scale, coefficient of regression is changed.
When the correlation coefficient r is equal to + 1 all the point in a scatter diagram would be(a) On a straight line direct from upper left to lower right(b) On a straight direction from lower left upper right(c) On a straight line(d) Both (a) and (b)Answer: b(d) Both (a) and (b)
Explanation:
When the correlation coefficient r is equal to + 1 all the point in a scatter diagram on a straight
line directed from lower left to upper right.
Question 27
In case of ``Insurance companies" profit and the number of claim they have to pay ther
iscorrelation.
(a) +ve (b) -ve
(c) No relation (d) None
Answer: b
Explanation:
In case of ``Insurance companies" profit and the number of claim they have to pay there pay
there is Negative correlation:
Ouestion 28
If the correlation coefficient between two variables is zero then the lines of regression
are

(a) Parallel

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(b) Perpendicular

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(c) Coincide

(d) None

Answer: b Explanation:

If the correlation coefficient between two variables is zero then the lines of regression are perpendicular

Question 29

Their competitors in a contest are ranked by two judges in the order 1,2,3 and 2,3,1 respective Calculate the spearman's rank correlation coefficient.

(a) -0.5	(b) -0.8
(c) 0.8	(d) 0.5

Answer: a

	_
Fvn	lanation:
БУЪ	anation.

Rank by 1 st judge R ₁	Rank by 2nd Judge R2	Diff $D = R_1 - R_2$	D ²
1	2	-1	1
2	3	-1	1
3	1	+2	4
			$\sum d^2 = 6$

Here n = 3

Spearman's Rank Correlation Coefficient = $1 - 6 \frac{\sum d^2}{n (n^2 - 1)}$

$$= 1 - \frac{6 \times 6}{3(3^2 - 1)}$$

= -0.5

Question 30

The strength (degree) of the correlation between a set of independent variables X and dependent variable Y is measured by

(a) Coefficient of Correlation

(c) Coefficient Determination

(b) Standard error of estimate(d) All of these

Answer: d Explanation:

The strength (degree) of the correlation between a set of independent variables X and dependent variable Y is measured through

- > Coefficient of Correlation
- Standard error of estimate
- Coefficient Determination

Question 31

The percent of told variation of the dependent variable Y explained by the set of independent variables X is measured by:

(a) Coefficient of Correlation

- (c) Coefficient Determination
- (b) Standard error of estimate
- (d) Coefficient of skewness

Answer: c

Explanation:

The coefficient of determination (denoted by R?) is a key output of regression analysis an R² of 0 means that the dependent variable cannot be predicted from the independent variable An R² of 1 means the dependents variable can be predicted without error from the independent variable variable

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Question 32

A coefficient of correlation is computed to be -0.95 means that

- (a) The relationship between two variables is weak
- (c) The relationship between two variables is strong and but negative
- (b) The relationship two variables is strong and positive
- (d) Correlation coefficient cannot have this value

Answer: c

Explanation:

A coefficient of correlation is compute to be -0.95 means that relationship between two variables is strong and but negative

Ouestion 33

Let the coefficient of determination computed to be 0.39 in a problem involving one independent variable and one dependent variable this result means that

- (a) The relationship between two variables is negative
- (c) 39% of the total variation is explained by (d) 39% of the total variation explained by the independent variable
- (b) The correlation coefficient is 0.39 also
 - the dependent variables

Answer: c **Explanation**:

The coefficient of determination computed to be 0.39 in a problem involving one independent variable and one dependent variable. 39% of the total variation is explained by the independent variable.

Ouestion 34

Relationship between correlation coefficient and coefficient of determination is that:

- (a) The coefficient of determination is the square of coefficient of correlation
- (b) The coefficient determination is the square root of the coefficient of correction (d) Both are equal

(c) Both are unrelated

Answer: a

Explanation:

Coefficient of correlation is "R" value which given in the summary table in the regression output. R square is called coefficient of determination multiply R times R to get the R value. In other word coefficient of correlation R square or Coeff.of determination shows percentage variation and in v which is explained by all the x variable together higher the better it is always between 0 and 1. It can never be negative – since is a squared value.

It is easy to explain the R square in term of regression it is not so easy to explain the R in terms of regression.

Ouestion 35

For a bivariate data two lines of regression are $40 \times -18y = 214$ and 8x - 10y + 66 = 0then find the value of x and y

(a) 17 and 13 (c) 15 and 17 **Answer: b Explanation:** Given: $40 \times -18y = 214$ (b) 13 and 17 (d) None

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8x: -10y = -66On solving (1) and (2) we get x = 13 and y = 17 \therefore x = 13 and y = 17

Question 36

In multiple regression when the global test of significance is rejected we can conclude that:

- (a) All of the net sample regression coefficient are equal to zero
- (c) At least one sample regression coefficient is not equal to zero
- (b) All of the sample regression coefficient are not equal to zero
- (d) The regression equation intersects the y – axis at zero

Answer: c

Explanation:

In multiple regression when the global test of significance is rejected we can conclude that at least one simple regression coefficient is not equal to zero.

Question 37

Correlation	Coefficient value lies between	

(a) – 1 and + 1	(b) 0 and 1
(c) -1 and 0	(d) None
Answer: a	

Explanation:

The strength of the linear association between two variables is qualified by the correlation coefficient the correlation coefficient always takes a value between -1 and 1 with 1 or -1 indicating perfect correlation (all point would lie along a straight line in this case)

Question 38

In correlation both variables are always				
(a) Random	(b) Non Random			
(c) Same	(d) None			
Answer: a				
_				

Explanation:

Complete correlation between two variables is expressed by either + 1 or -1 when one variable increases the correlation is positive when on decrease as the order increases it is negative complete absence of correlation is represented by 0.

Question 39

The table below shows the number of absence x, in a calculsis course and the final exam grade y for 7 student find the correlation coefficient.

graue y	101 / Stut	ient mu the		in coefficie	u t.		
Х	1	0	2	6	4	3	3
у	95	90	90	55	70	80	85
(a) 0.38				(b) -0.3	88		
(c)0.62	(d) -0.93						
Answer: d							
Explana	tion:						
You may	use the fa	icts that (do	uble check t	his for pract	tice)		
-		$\sum x^2 = 75, \sum y$					
		_					

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Calculate the numerator: $n \sum (xy) - (\sum x)(\sum y) = 7.1380 - 19 \times 565 = -1075$ Then the calculate the denominator;

 $\sqrt{[n(x^2) - (x)^2]}\sqrt{[n(y^2) - (y)^2]}$ (525 - 369). [327425 - 319225]

Ouestion 40

Two regression lines are parallel to each other if their slope is (b) Non Random

(a) Random

(c) Same

Answer: c **Explanation**:

When there is a reasonable amount of scatter we can draw to different regression lines depending upon which variable we consider to be the most accurate The first is a line of regression of y on x which can be used to estimate y given x the other is a line of regression of x on y used to estimate x given y Hence two regression lines are parallel to each other if their slope is same

(d) None

Ouestion 41

When regression line passes through the origin then

(a	I)	R	egress	sion	coefficient is zero
-	~				

(c) Intercept is zero

(b) Correlation is zero (d) Association is zero

Answer: c

Explanation:

Prism linear regression analysis fits a straight line through your data and lets you force the line to go through the origin this is useful when you are sure that the line must begin at the origin (x = 0 and y = 0) Prism's nonlinear regression offers the equation line through origin.

Ouestion 42

The table below shows the number of absence, x in a calculate course and the final exam grand, y for 7 student find the correlation coefficient. 0

Х	1	0	2	6	4	3	3	
у	85	80	70	55	90	90	95	
(a) 0.38				(b) 0.6				
(c) -0.38				(d) 0.62				
Answer: c	:							
Explanati	on:							
There are	7 ordered p	airs (x,y) so	n = 7 Calcul	late the nee	ded sums:			
Х	Y		X ²		Y ²	xy		
1	85		1		7225	85		
0	80		0		6400	0		
2	70		4		4900	140		
6	55		36		3025	330		
4	90		16		8100	360		
3	90		9		8100	270		
3	95		9		9025	285		
X = 19	Y =	565	X ² = 75		$Y^2 = 46775$	Xy= 1	470	

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17.15

Calculation the numerator: $n \sum (xy) - (\sum x)(\sum y)$ = 7. 1470 -19. 565 = - 445 Then calculate the denominator: $\sqrt{n \sum x^2 - (\sum x)^2} \sqrt{n \sum y^2 - (\sum y)^2}$ = $\sqrt{7.75 - (19)^2} \cdot \sqrt{746775 - (565)^2}$ = $\sqrt{164} \cdot \sqrt{8200} = 1159.66$ Now, divide to get $r = \frac{-445}{1159.66} = -0.38$

Question 43

If two variables oppose each other than the correlation will be

(a) Positive Correlation(c) Perfect CorrelationAnswer: b

(b) Negative Correlation (d) None

Explanation:

A correlation of zero means there is no relationship between the two variables, when there is a negative correlation between two variables as the value of one variable increase the value of the other variable decrease and *vise- versa*

Question 44

The time x in years that an employee spent at a company and the employee's hourly pay, y for 5 employees are listed in the table below.

(b) -097

(d) None

Calculate and interpret the correlation coefficient r. Include a plot of the data in your discussion

(a) 0.38

(c) 0.62

Answer: d Explanation:

Explanation.				
Χ	Y	X ²	Y ²	ху
5	25	25	625	125
3	20	9	400	60
4	21	16	441	84
10	35	100	1225	350
15	38	225	1444	570
X = 37	Y=139	X ² 375	Y ² = 4135	XY = 1189

Hint Calculate the numerator:

 $n \sum (xy) - (\sum x)(\sum y) = 5.1189 - 37.139 = 802$

Then calculate the denominator

 $= \sqrt{n\sum x^2 - (\sum x)^2} \sqrt{n\sum y^2 - (\sum y)^2}$

 $=\sqrt{5 \times 375 - (37)^2} \cdot \sqrt{5.4135 - (37)^2}$ $= \sqrt{506} \cdot \sqrt{1354} = 827.72$ Now divide to get r = $\frac{802}{827.72} = 0.97$

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Question45 Identify the true correlation

(a) -1 & 1

(c) 0& 1

Answer: a

Explanation:

This will always be a number between -1 and 1 (inclusive)

• If is close to 1 we say that the variables are positively correlated. This means there is likely a strong linear relationship between the two variables with a positive slope.

(b) -1 & 0

(d) All are true

- If is close to-1 we say that the variable are negatively correlated this means there is likely a strong linear relationship between the two variable with a negative slope.
- If r is close to 0, we say that the variables are not correlation this means that variables may still be related some other way.

Question 46

A researcher carefully computes the correlation coefficient between two variables and gets r = 1.23 what does this value mean?

(a) -1 <u><</u> r <u><</u> 1	(b) -1 <u>≥</u> r <u>≥</u> 1
(c) Both	(d) None
Answer: a	
Explanation:	
A error was made all correlation co	oefficient -1 <u><</u> r <u><</u> 1

Question 47

If R² is zero that is no collinearly / Multicollinearity the variance inflation factor (VIF) will be (a) 1 (b) 2 (c) 3 (d) None Answer: a Explanation: $VIF = \frac{1}{1-R^2}$

Question 48If the equation of regression line is y = 5, then what result will you take out from it?(a) The line is parallel to x- axis(b)_ The line passes through (5.0)(c) The line passes through origin(d) The line passes through originAnswer: aExplanation:y = k for one value of y there are infinite value of x

Question 49

The method of least squares finds the best fit line that the error between observed and estimated point on the line

(a) Reduces to zero (c) Minimize Answer: c Explanation:

- (b) Approaches to infinity
- (d) Maximize

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The method f least squares finds the best fit line that minimize the error between observed and estimate points on the line.

Question50

A regression model may be: (a) Linear (c) Both (a) and (b) Answer: a Explanation:

(b) Non - linear(d) Neither (a) and (b)

In the regression it appears on the left side of the equal sign, while your can use regression to predict the dependent variable your always start with a set of known y value and use these be build (or to calibrate) the regression model may be linear and nonlinear both

PAST EXAMINATION QUESTION

<u>MAY 2018</u>

(b) -ve (d) a or b

Question1

If the model points are a scatter diagram is evenly distributed then the correlation is:

(a) 0 (c) +ve

Answer: a

Explanation:

In the case of a positive correlation, the plotted points are distributed from lower left corner to upper right corner (in the general pattern of being evenly spread about a straight line with a positive slope), and in the case of a negative correlation, the plotted points are spread out about a straight line of a ...

Question2

If the plotted points in a scatter are evenly distributed, then the correlations zero.

The covariance between variable is

(a) Strictly positive

(c) Always zero.

(b) Strictly negative

(d) Either positive or negative zero.

Answer: d

Explanation:

The Co- variance between two variables is either positive or negative or zero.

Question3

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The coefficient of determination is de	fined by the formula.
(a) $r^2 = \frac{1 - unexpanding variance}{Total variance}$	(b) $r^2 = \frac{expanding d variance}{Total variance}$
(c) Both (a) and (b)	(d) None
Answer: c	(u) None
Explanation:	
The coefficient of determination	
$r^{2} = \frac{1 - unexpatianted variance}{Total variance}$	
$r^{2} = \frac{expatianted variance}{Total variance}$	
Question4	
-	ns only the directions of change (positive
direction/ Negative direction) in the	variable are taken into account for
calculation of	
(a) Coefficient of SD	(b) Coefficient of regression
(c) Coefficient of correlation	(d) None
Answer: c	
Explanation:	
-	y the direction of change (positive direction/
-	caken into account for calculation of coefficient
of correlation	
Question5	
Correlation coefficient isof the unit	ts of measurement
(a) Dependent	(b) Independent
(c) Both	(d) None
Answer: b	
Explanation:	
Correlation coefficient is Independent of	the units of measurement.
Question 6	
In case speed of an automatic and the	distance required to stop the car after
applying correlation is	
(a) +ve	(b) -ve
(c) 0	(d) None
Answer: a	
Explanation:	
	stance required to stop the car after applying
correlation is positive	
Question7	
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A relationship $r^2 = 1 - \frac{500}{300}$ i	s possible	
(a) True	(b) False	
(c) Both	(d) None	
Answer: a		
Explanation:		
$r^2 = 1 - \frac{500}{300}$ is possible		
$r^2 = 1 - \frac{\frac{300}{-200}}{300}$ is not possible		
So it is true		
Question8		
Rank correlation coefficient	nt lies between	
(a) -1 to + 1	(b) 0 to 1	
(c) -1 to 0	(d) Both	
Answer: a		
Explanation:		
Rank correlation coefficient	lies between -1 to + 1 inclusive	e of both value.
	NOV 2018	
<u>Question1</u>		
The two lines of regression	n intersect at the point	
(a) Mean	(b) Mode	
(c) Median	(d) None	
Answer: a		
Explanation:		
The two lines of regression i	ntersect at the point is Mean.	
<u>Question2</u>		
-	n are x + 2y -5 = 0 and 0, ther	n the regression line of y
on x s:		
(a)x + 2y - 5 = 0	(b) $2x + 3y - 8 = 0$	
(c) $x + 2y = 0$	(d) $2x + 3y = 0$	
Answer: a		
Explanation:		
Given two regression line ar		
x + 2y 5 = 0 and $2x + 3y - 8 = 0$		
byx = $\frac{-coff.of x}{coff of y} = \frac{-1}{2}$ and bxy	$\frac{1}{coff of x} = \frac{1}{2}$	
Here, bxy× $bxy \leq 1$ which is	s satisfied	
So.1 st equation x+2y-5 =0 is	the regression equation y on x	
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Question3	
-	=y and 8y = 6x the value of correlation
coefficient is:	
(a) 0.5	(b) -0.5
(c) 0.75	(d) -0.80
Answer: a	
Explanation:	
Given	
Regression line	
3x=y and 8y=6x	
3x-y =0 and 6x-8y =0	
bxy = $\frac{-coff.of y}{coff of x}$ and byx $\frac{-coff.of x}{coff of y}$	
$\frac{-(-1)}{3} = \frac{-6}{-8} = \frac{3}{4}$	
$a^{3} = \frac{-8}{3}bxy = 3/4$	
Coff. of correlation is given by	
$r = \pm \sqrt{byx \times bxy}$	
$=$ $\pm \sqrt{\frac{3}{4} \times \frac{1}{3}}$	
$-\sqrt{4}$ 3	
$=+\frac{1}{4}$	
+1/2	
= 0.5	
Ouestion4	
The regression coefficient is indepen	dent of the change of
(a) Scale	(b) Origin
(c) Scale and Origin both	(d) None
Answer: b	
Explanation:	
The regression coefficient is independent	nt of the change of `Origin'
Question5	
If the correlation coefficient between	the variable X and Y is 0.5. then the
correlation between the variable 2x-4	
Answer:	
2x-u - 4 = 0 and $2y + v - 3 = 0$	
$b = \frac{-coff.of u}{coff of x} \text{ and } d = \frac{-coff.of v}{coff of y}$ $d = \frac{1}{2} \qquad d = \frac{-1}{2}$	
$d = \frac{1}{2}$ $d = \frac{-1}{2}$	
Here, b and d both have different sign so	$r_{uv} = -r_{xy}$
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= -0.5

<u>MAY 2019</u>

Question1

Given that					
Х	-3	-3/2	0	3/2	3
у	9	9/4	0	9/4	9
(a) Positive(b) Zero(c) Negative(d) NoneAnswer: bExplanation:					
X	y	X ²	Y ²		ху
-3	9	9	81		-27
-3/2	9/4	9/4	81/2	16	-27/8
0	0	0	0		0
3/2	9/4	9/4	81/2	16	27/8
3	9	9	81		27
0	90	Ç		2754	0
	$=\frac{45}{2}$ 4	$=\frac{45}{2}$		$\frac{16}{1377}$	
Hence Answer 0					

Question2

Given the following series:

Х	10	13	12	15	8	15
у	12	6	18	16	7	18

The rank correction coefficient r =

(a)
$$1 - \frac{6 \sum d^3 + \sum_{i=d}^2 \frac{m_2(m_2^3 - 1)}{12}}{m(n^{2-1})}$$

(c)
$$1 - \frac{6[\sum d^2 + \sum_{i=1}^3 m_2(m_1^9 - 1)]}{n(n^2 - 1)}$$

(b)
$$1 - \frac{6\left[\sum d^2 + \sum_{i=1}^3 \frac{m_2(m_1^2 - 1)}{12}\right]}{n(n^2 - 1)}$$

(d) None

Answer: b Explanation:

$$1 - \frac{6\left[\sum d^2 + \sum_{i=1}^3 \frac{m_2(m_1^2 - 1)}{12}\right]}{n(n^2 - 1)}$$

<u>Question3</u> If the regression line of y on x is given by y = x+ 2 and Karlperson`s coefficient of

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correlation is 0.5 then $\frac{\sigma y^2}{\sigma x^2}$		
(a) 3	(b) 2	
(c) 4	(d) None	
Answer: c		
Explanation:		
y on x = y = x + 2		
R = 0.5		
byx = r × $\frac{\sigma y}{\sigma x}$		
$byx = \frac{2}{0.5} \sigma x$		
$0yx - \frac{1}{0.5}$		
<u>Question4</u>		
A .M. OF regression coefficient is:		
(a) Equal to r	(b) Great than or equal to r	
(c) Half of r	(d) None of these	
Answer: b		
Explanation:		
Regression coefficient is a statistical me	asure of the average functional relationship	
between two or more variable In regres	sion analysis one variable is considered as	
dependent and other as independent, Th	nus it measure the degree of dependence of one	
variable on the order (s)		
Question5		
If the two regression lines are x + y =	-	
(a) 1,0	(b) 0,1	
(c) 1,1	(d) None of these	
Answer: d		
Explanation:		
Consider x-y =1 as equation (1) as equation (2)		
Now add both (1) and (2)		
You get $2x=2$ i.e. $x=1$		
Now put x=1 in either of equation (1) or	· (Z)	
You get y=0		
Question6		
Coefficient of correlation between X a	and Y is 0.6 if both X and Y are multiplied	
then resultant coefficient of correlation	on:	
(a) 0.6	(b) 1/0.6	
(c) Both	(d) None of these	
Answer: a		
Explanation:		
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Value of Correlation will -0.6 as if you m sign and as per property bxy , byx& r sig	ultiply x & y by -1 then this will show negative h should be equal / same	
<u>NO</u>	<u>V 2019</u>	
Question1		
If two of regression are $x + 2y - 5 = 0$ a		
(a) y on x (c) Both	(b) x on y (d) None	
Answer: a		
Explanation:		
x + 2y -5 =0 – Eq 1 2x + 3y -8 = 0- Eq2		
Let Eq 1 be y on x from Eq^2		
by $x = \frac{-cofficient of x}{cofficient of y}$ by $x = \frac{-cofficient of x}{cofficient of y}$		
by $x = \left(\frac{-1}{2}\right) \times \left(\frac{-3}{2}\right) = \frac{3}{4}$		
So, byx × bxy< 1		
So, $\times + 2y - 5 = 0$ is y on \times		
and $2x + 3y - 8 = 0$ is x on y		
Question?		
<u>Question2</u> Find the coefficient of regression.		
2x + 3y = 2		
4x + 3y = 4		
(a) 0.5	(b) -0.5	
(c) 0.25	(d) -0.25	
Answer: b Explanation:		
2x + 3y = 2 - Eq 1 ax + 3y = 4 - Eq 2		
Let Eq1 be y on x		
From Eq1		
byx = $\frac{-cofficient of x}{cofficient of y} = \frac{-2}{3}$		
From Eq2		
bxy = $\frac{-cofficient \ of \ x}{cofficient \ of \ y} = \frac{-3}{4}$		
So above assumption hold true.		
$r = \pm \sqrt{b_{yx} x b_{xy}}$		
$r = \pm \sqrt{\left(\frac{-2}{3}\right)} x \left(\frac{-3}{4}\right)$		
$r = \frac{-1}{2}$		
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r= -0.5

Question3					
What is the coefficient of correlation from the following data?					
X:	1	2	3	4	5
Y:	5	4	3	2	6
(a) 0 (b) -0.75					
(c) -0.85 (d) 0.82					
Answer: a					
Explanation:					
	Х		Y		Ху
	1		5		5
	2		4		8
	3	3 9			
	4		2		8
	5		6		30
Σρ	x = 15	$\sum x$	= 20	$\sum x_1$	v = 60

 $cov (x,y) = \frac{\sum xy}{n} - \overline{x}, \overline{y}$ $= \frac{60}{5} - \left(\frac{15}{5}\right) \times \left(\frac{20}{5}\right)$ = 12 - 12cov (x,y) = 0 $r = \frac{cov(x,y)}{\sigma_x \sigma_x}$ r = 0

Question4

If the plotted points in a scatter diagram lie from upper left to lower right, then correlation is:

(a) Positive

(c) Zero

Answer: b

(b) Negative(d) None of these

Explanation:

If the points in a scatter diagram lie from upper to left lower right them correlation us negative.

DEC 2020

<u>Question 1</u>

Which of the following is spurious correlation?

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(a) Correlation between two variables having no causal relationship	(b) Negative Correlation		
(c) Bad relation between two variable	(d) Very low correlation between two variables		
Answer: a			
Explanation:	ng ng gaugal relationship		
Correlation between two variables hav	ng no causar relationsmp		
Question 2			
Scatter diagram does not help us to			
(a) Find the type of correlation	(b) Identify whether variables correlated or not		
(c) Determine the linear (or) non – linear correlation	(d) Find the numerical value of correlation coefficient		
Answer: d			
Explanation:			
To Find the numerical value of correlation	on coefficient		
Question 3The Covariance between two variables is(a) Strictly Positive(b) Strictly Negative(c) Always Zero(d) Either positive (or) Negative (or) ZeroAnswer: dExplanation:Covariance can be positive, zero, or negative If X and Y are independent variables, then their covariance is 0: Cov $(X, Y) = E(XY) - \mu X \mu Y = E(X)E(Y) - \mu X \mu Y = 0$ The converse, however, is not always true. Cov (X, Y) can be 0 for variables that are not inde- pendent. Hence, either positive (or) Negative (or) Zero			
	<u>N 2021</u>		
Question 1 For the set of observations {(1, 2), (2, 5), (3, 7), (4, 8), (5, 10)}, the value of Karl- person's coefficient is approximately given by (a) 0.755 (b) 0.655 (c) 0.525 (d) 0.985 Answer: d Explanation:			
x y xy	x ² y ²		
1 2 2	1 4		
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2	5	10	4	25
3	7	21	9	49
4	8	32	16	64
5	10	50	25	100
Total 15	32	115	55	242
$5 \times 115 - 15 \times 32$				

$$\frac{\sqrt{5 \times 55 - (15)^2}\sqrt{5 \times 242 - (32)^2}}{95}$$

 $\sqrt{50}\sqrt{186}$

95

 $7.07106 \times 13.638 = 0.985105$

Question 2

The coefficient of correlation between x and y is 0.5, the covariance is 16, and the standard deviation of x is 4. Then the standard deviation of y is

(a) 4	(b) 8
(c) 16	(d) 64
Answer: b	
Explanation:	
cov(x, y)	
$r_{xy} = \frac{1}{\sqrt{Var(x).Var(y)}}$	
$r_{xv} = 8$	

Question 3

The intersecting point of the two regression lines: y on x and x on y is

(a) $(0_1 0)$	(b) (\bar{x}, \bar{y})
(c) (b _{yx} , b _{xy})	(d) (1, 1)

Answer: b

Explanation:

Properties of Regression Lines There are two lines of regression. Both these lines are known to intersect at a specific point (\bar{x}, \bar{y}) Here the variables under consideration are x and y.

Question 4

Given that the variance of x is equal to the square of standard deviation by and the regression line of y on x is y = 40 + 0.5 (x - 30). Then regression line of x on y is

(a) y = 40 + 4(x - 30)(b) y = 40 + (x - 30)(c) y = 40 + 2(x - 30)(d) x = 30 + 2 + 2(x - 40)Answer: d Explanation: For more Info Visit - www.KITest.in

Ouestion 5

The regression coefficient remain unchanged due to

(a) A shift of scale

(b) A shift of origin (c) Replacing x – values by $\frac{1}{r}$ (d) Replacing y values by $\frac{1}{r}$

Answer: b

Explanation:

The regression coefficient remain unchanged due to A shift of origin By properties of regression line we have, The regression coefficients remain unchanged due to a shift of origin but change due to a shift of scale.

IULY 2021

(b) Positive

(d) 10

Ouestion 1

If the sum of the product of the deviation of and Y from their means is zero correlation coefficient between X and Y is:

(c) Negative

Answer: Options (a)

Explanation:

Given: sum of the product of deviations of x and y series from their mean is zero, To Find: the coefficient of correlation r = coefficient of correlation r = Sxy / (Sx . Sy)Correlation coefficient = $cov(x,y)/(std deviation(x) \times std deviation(y))$ product of deviations of x and y series from their mean is zero => Sxy = 0=> r = 0Coefficient of correlation = 0 Ans: If the sum of the product of deviations of x and y series from their mean is zero,

then the coefficient of correlation will be ZERO

Question 2

If the slope of the regression line is calculated to be 5.5 and the intercept 15 then the value of Y when X is 6 is

(a) 88	(b) 48
(c) 18	(d) 78
Answer: Options (b)	

Explanation: The value of Y when X is 6

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a+bX 15+5.5(6) Ans: 48

Question 3

If y = 9x and X = 0.01Y, then r is equal to:				
(a) -0.1	(b) 0.1			
(c) 0.3	(d) -0.3			
Answer: Options (c)				

Question 4

The straight – line graph of the linear equation Y = a +b X, slope is horizontal if:(a) b = 1(b) $b \neq 0$ (c) b = 0(d) $a = b \neq 0$ Answer: Options (c)

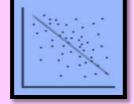
Question 5

If $\mathbf{b}_{xy} = -1.6$ and $\mathbf{b}_{xy} = -0.4$, then \mathbf{r}_{xy} will be	
(a) 0.4	(b) -0.8
(c) 0.64	(d) 0.8
Answer: Options (b)	

DEC 2021

Question 1

(a) Direct (c) Indirect Answer: c Explanation: (b) Imperfect indirect(d) Imperfect direct



This is a Perfect Negative correlation, or indirect correlation.

Question 2 For any two variables x and y the regression equations are given as 2x + 5y - 9 = 0

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and 3x - y - 5 = 0. What are the A.M. of x and y?						
(a) 2, 1 (b) 1, 2						
(c) 4, 2 (d) 2, 4						
Answer: a						
Explanation:						
The regression lines intersect at the means of x and y. Therefore, the	e common point of					
intersection of these two lines will give the means of X and y. This r	neans that the					
means of x and y will satisfy these two equations simultaneously.						
We can either solve these two equations simultaneously or find out	the values of x and					
y, which will give uS our means; or, we can simply try the options.						
Option (a) - 2, 1						
Putting the value of \times = 2, and y = 1 in the equation						
2x + 5y - 9 = 0, we get						
LHS = $2(2) + 5(1) - 9 = 0 = RHS$						
Putting the value of $x = 2$, and $y = in$ the equation						
3x - y - 5 = 0, we get						
LHS = 3(2) - 1 - 5 = 0 = RHS						
Therefore, option (a) is the answer.						
Question 3						
The intersecting point of two regression lines falls at X-axis. If						
values is 16, the standard deviations of X and Y are respectivel	y, 3 and 4, then the					
mean of Y-values is						
(a) 16/3 (b) 4						
(c) 0 (d) 1						
Answer: c						
Explanation:						
The intersecting point of two regression lines gives the means of x a point of intersection falls on the x-axis, the value of x is 0. Therefore						

point of intersection falls on the x-axis, the value of y is 0. Therefore, the mean of y-values is zero.

Question 4

The regression coefficients remain unchanged due to

(a) Shift of origin(c) Always

(b) Shift of scale(d) Never

Answer: a Explanation:

The regression coefficient remain uncharged due to shift of origin.

JUNE 2022

Question 1

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If Coefficient of correlation for 3X+ 4y = 6 is 0.5. Find the coefficient of						
correlation for of $3u + 9v = 7$ for u and v.						
(a) -(0.5)	(b) (0.5)					
(c) ‡ 0.5	(d) 0.25					
Answer: b						
Explanation:						
We know that shift of scale coefficient of (un correlation is change	nder consideration) then $r_{xy} = r_{uv} = 0.5$					
Question 2						
Karl Pearson Correlation Coefficient met						
(a) Any data	(b) Scattered data					
(c) Grouped data	(d) Ungrouped data					
Answer: d						
Explanation:						
Karl Pearson Correlation Coefficient method	a is used for ungrouped data.					
Question 3						
If the plotted point in a scatter diagram l	ie from lower left to upper right then					
correction is:						
(a) Positive	(b) Negative					
(c) Perfectively Negative	(d) Zero					
Answer: a						
Explanation: If the plotted point in a scatter diagram lie f	rom lower left to upper right then it is said					
to be positive correlation.	rom lower left to upper right them it is salu					
Question 4						
If concurrent coefficient is $\frac{1}{\sqrt{3}}$. If sum of definitions of the second	eviation is n 6 for n pairs of data?					
(a) 9	(b) 8					
(c) 10	(d) 11					
Answer: c						
Explanation:						
Given $r_c = \frac{1}{\sqrt{3}}$, n= ?						
C=6						
Coeff of concurrent deviation						
$r_c = \pm \sqrt{\frac{2c - m}{m}}$						

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$$\frac{1}{\sqrt{3}} = \pm \sqrt{\frac{2 \times 6 - m}{m}}$$
On squaring both side
$$\left[\frac{1}{\sqrt{3}}\right]^2 = \left[\pm \sqrt{\frac{12 - m}{m}}\right]^2$$

$$\frac{1}{3} = \frac{12 - m}{m}$$
m = 36 - 3m
m + 3m = 36
4m = 36
4m = 36
m = \frac{36}{4} = 9
n = m + 1 = 9 + 1 = 10

Question 5

Which of the following is used he find correlation between two qualitative characteristics

- (a) Karl Pearson
- (c) Concurrent deviation

(b) Spearman rank correlation

(d) Scatter diagram

Answer: b

Explanation:

Spearman's rank correlation coefficient is used to find correlation between two qualitative characteristics.

Question 6

Scattered diagram is used the plot	
(a) Quantitative data	(b) Qualitative data
(c) Discrete data	(d) Continuous data
Answer: a	
Explanation:	
	and the second sec

Scattered diagram is used to plot quantitative data.

DEC 2022

Question 1

The equations of the two lines of regression are 4x+3y+7=0 and 3x+4y+8=0, Find the correlation coefficient between x and y?

a) -0.75	b) 0.25
c) -0.92	d) 1.25
Answer: Ontions (a)	

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Explanation:

4x+3y-7(i) 3x+4y -8(ii) Eqn.(i) \times 3 –eqn (ii) \times 4 12x + 9y = -21-12x-16y = 32-7y = 11 $y = \frac{-11}{7}$ Putting value of y in eqn (i) x = -4/7. Therefore, $\bar{x} = -\frac{4}{7}; \bar{y} = -\frac{11}{7}$ Coefficient of Correlation $|r| = b_{yx}b_{xy} = \sqrt{\frac{-3}{4} \times \frac{-3}{4}}$ $r = \pm \frac{-3}{4} = -0.75$ **Ouestion 2** If the regression equation are 2x+3y+1 = 0 and 5x + 6y + 1 = 0, then Mean of x and y respectively are a) -1, -1 b) -1, 1 c) 1, -1 d) 2, 3 **Answer: Options (c) Explanation**: By option c Putting x=1 y=-1 2(1) + 3(-1) + 1 = 05(1) + 6(-1) + 1 = 0x= 1, y = -1 **Question 3** If b yx = 0.5, b xy = 0.46 then the value of correlation coefficient r is: a) 0.23 b) 0.25 d) 0.48 c) 0.39 **Answer: Options (d) Explanation:** Correlation coefficient is the geometric mean between regression coefficients i.e., $r = \pm \sqrt{b_{\nu x} b_{x \nu}}$ $r = +\sqrt{0.5 \times 0.46} = +0.479$ = 0.48For more Info Visit - www.KITest.in join our telegram channel @Ca foundation quiz group

Ouestion 4

The coefficient of rank correlation between the ranking of following 6 students in two subjects Mathematics and Statistics is :

the subjects Mat	nematics and sta	usuc	5 15 1					
	Mathematics	3	5	8	4	7	10	
	Statistics	6	4	9	8	1	2	
				•				
a) 0.25			b)	0.35				
c) 0.38			d)	0.20				
Answer: Options	(a)							
Explanation :								
Mathematics	Statistics	C	l= r 1	- r ₂		d ²		
3	6	6.0	3			9		
5	4	1	l			1		
8	9	1	l			1		
4	8	Z	1			16		
7	1	6	5			36		
10	2	8	3			64		
Total	6					$\sum d^2$	= 12	7
	1						2	

According to spearman's rank correlation coefficient $p = \frac{1-6\sum d^2}{n(n^2-1)}$

 $1-6 \times 127$

6(36-1)

= 0.25

Ouestion 5

Pearson's correlation coefficient between x and y is

a)	$\frac{Cov(x,y)}{S_x S_y}$	b) $\frac{Cov(x,y)}{S_x S_y}$
c)	Cov(x,y)	d) None
۰J	σχσγ	

Answer: Options (c)

Explanation:

Pearson correlation coefficient (rxy), named after the English mathematician and biostatistician Karl Pearson, is a statistical measure of the degree of linear correlation

between these two variables and is defined as follows $\frac{Cov(x,y)}{r}$

Question 6

The speeds of a number of bikes follow a normal distribution model with a mean of 83km/ hr and a standard deviation of 9.4 km/hr. Find the probability that a bike picked at random is travelling at more than 95 km/hr? b) 0.38

a) 0.1587

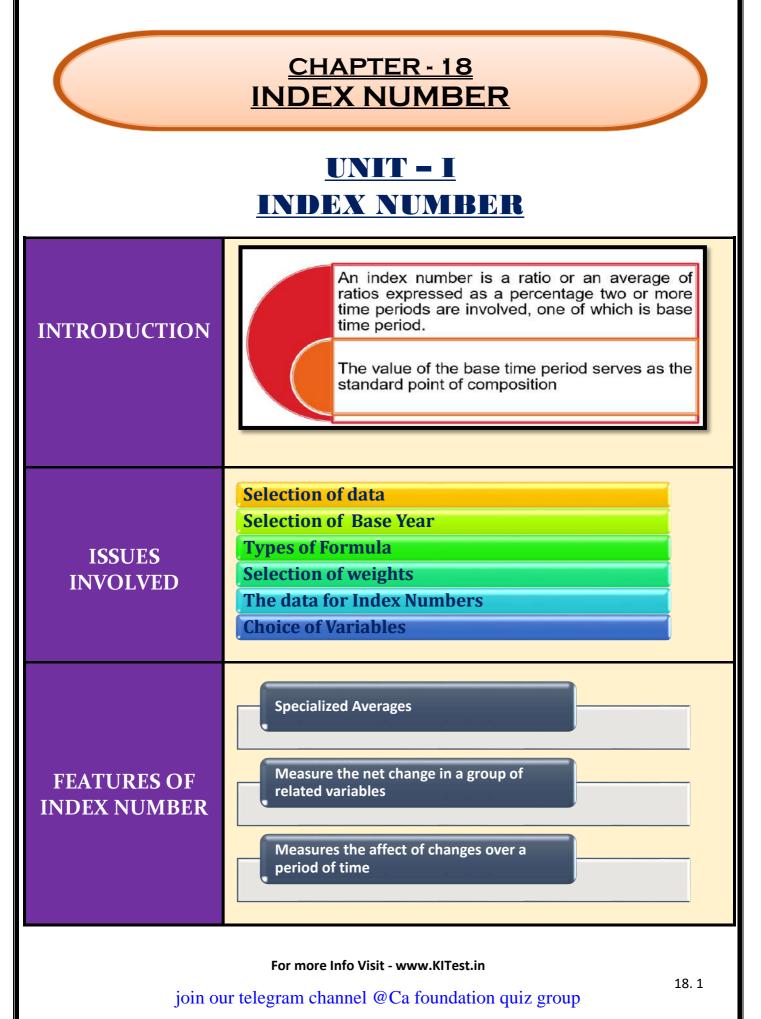
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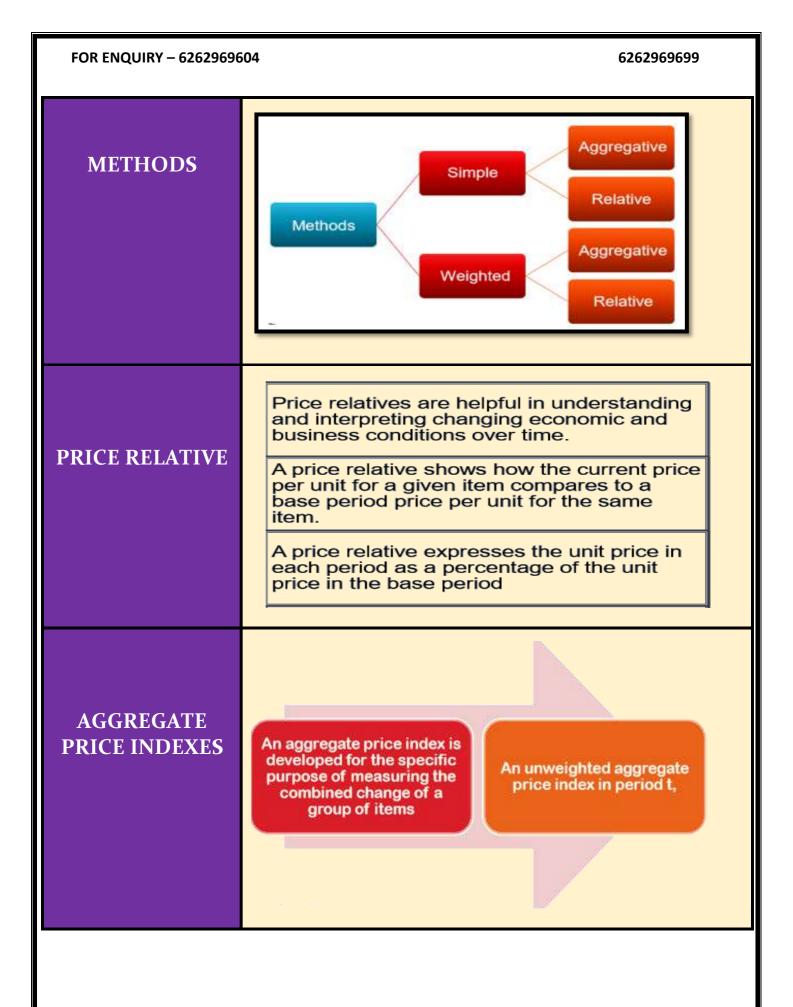
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c) 0.49	
Answer: Options	(b)

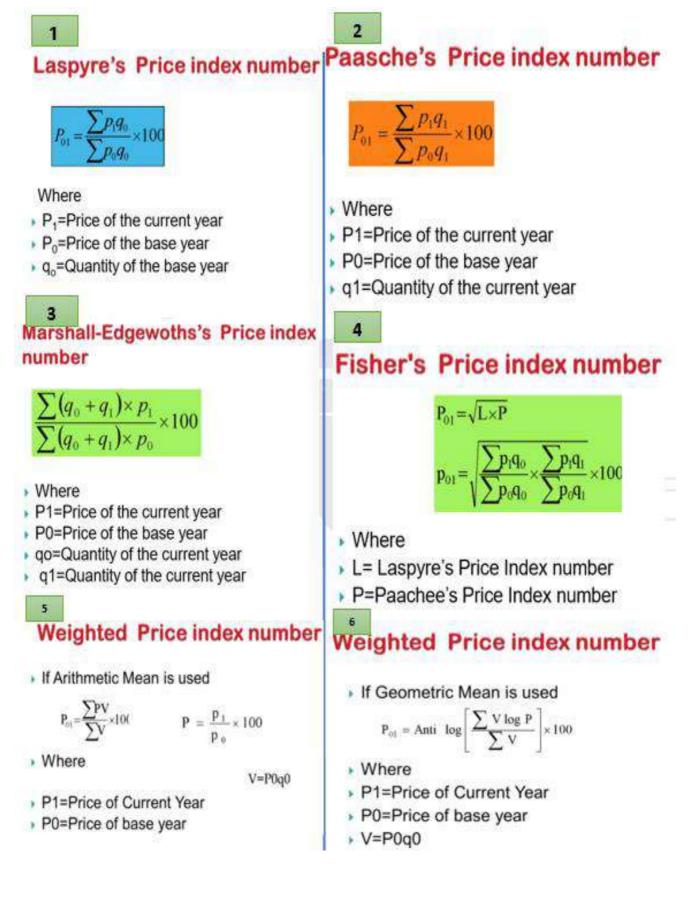
d) 0.278

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QUANTITY INDEXES	An index that measures changes in quantity levels over time is called a quantity Index. Probably the best known quantity Index is the Index of Industrial Production.			
QUANTITY INDEXES NUMBERS	1. Simple Aggregate of Quantities = $\frac{\sum Q_n}{\sum Q_0}$ 2. The simple average Quantity relatives $\frac{\sum Q_n}{\sum Q_0}$ 3. Weighted Aggregate Quantity indices i. With base your weight (Laspyres's Index) $\frac{\sum Q_n p_0}{\sum Q_0 p_0} \times 100$ ii. With Current year weight (Paasche's Index) $\frac{\sum Q_n p_n}{\sum Q_0 n} \times 100$ iii. Geometric Mean of (1) and (2) $\sqrt{\frac{\sum Q_n P_0 \sum Q_n P_n}{\sum Q_0 P_n} \times 100}$ iv. Base year average of quantity relatives $\frac{\sum Q_n P_0 \sum Q_n P_n}{\sum P_0 Q_0} \times 100$			
VALUE INDEX NUMBER	$\frac{\sum V_n}{\sum V_0} = \frac{\sum P_n Q_n}{\sum P_0 Q_0}$			
TEST OF ADEQUACY OF INDEX NUMBERS	Unit Test Time Reversal Test Factor Reversal Test Circular Test			
UNIT TEST	The Unit test requires that the formula for constructing an index should be independent of the units in which, prices and quantities are quoted. All formulae except thee simple (un weighted) aggregate index formula satisfy this test.			
joi	For more Info Visit - www.KITest.in 18. 4 join our telegram channel @Ca foundation quiz group			

FOR ENQUIRY – 6262	FOR ENQUIRY – 6262969604 6262969699					
TIME REVERSAL TEST	Where P_{01} is the P_{10} is the index n the base,	es time reversal test if it give price index number for the c umber of the base year, takin without the factor 100.	current year			
FACTOR REVERSAL TEST	Where P_{01} is the p q_{01} is the quantit	A method satisfies factor reversal test if it gives $P_{01} \times q_{01} = \frac{\sum p_1 q_1}{\sum p_0 q_0}$ Where P_{01} is the price index for the current year q_{01} is the quantity index for the current year Fishers index umber only satisfies the factor reversal test				
CHAIN BASE INDEX NUMBERS	Chain base index numbers is one in which the figures for each are first expressed s percentage of the preceding year. The percentage of chained together by successive multiplication to form a series of chain index, in chain base year index method the base year changes from year to year <u>Link realtive of current year × chain index Previous year</u> $\frac{100}{Current year Price Index}$					
	1000000000000000000000000000000000000					
SPLICING	Technique of linking two or more index number series with same items and a common overlapping year but with different base period in order to form a continuous series. Splicing may be forward or backward Forward Splicing					
	SplicingIndex no. of old seriesIndex no. of new seriesBackwardNo change= (Index number of old series/100)×Giv en index No. of new series					
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	Index number using new base Index Number using new base Old index number using old base Index number Corresponding new base	year × 100	
USES OF INDEX NUMBERS	1. As the indices are constructed mostly from d samples, chances of errors creeping in canno avoided. 2. Since index numbers are based on some sele simply depict the broad trend and not the re 3. Since may methods are employed for constru- numbers, the result gives different values and create confusion. Deflated Time series using index Numbers Delated Value = $\frac{Current \ value}{Price \ index \ of \ the \ current \ year} \ or$ = Current Value × $\frac{Base \ price \ (P_0)}{Current \ Price \ (P_n)}$	ot be always ected items, they al picture. ucting index	
LIMITATIONS OF INDEX NUMBERS	As we know, our indices are of prices and quant question is: does our index reflect a change in the product or item? Apart from quantity changes, there are other as pertinent while we are interpreting index numb ask whether the weights assigned to different it appropriate.	he quantity of a spects that are bers. We have to	
METHODS OF CONSTRUCTING CONSUMER PRICE INDEX	Aggregate Expenditure method Family budget in Aggregate expenditure method is a weighted ag index where weights are the base period quant Index number) $CPI = \frac{\sum p_1 q_0}{\sum p_0 q_0} \times 100$	gregated price	
FAMILY BUDGET METHOD	Weighted Aggregated of price relatives Index is obtained by taking the average of weight relatives and the value weights are used $CPI = \frac{\sum p_v}{v} \frac{p_1}{p_0} \times 100$ $V = P_0. Q_0$	hted price	
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Ouestion 1 Construct the following indices by taking 1997 as the base: (i) Simple Aggregative price Index

Item	Α	В	С	D	E
Price Rs. (1997)	6	2	4	10	8
Price Rs. (1998)	10	2	6	12	12
Price Rs. (1999)	15	3	8	14	16

(b) 120.90, 140.6

(d) 56,420

(a) 140, 186.67

(c) 140, 120.90

Answer: A

Explanation:

Item	Po	P ₁	P ₂	$\mathbf{P_1} = \frac{P_1}{p_0} \times 100$	$\mathbf{P}_2 = \frac{p_2}{P_0} \times 100$
А	6	10	15	166.67	250
В	2	2	3	100.00	150
С	4	6	8	150.00	200
D	10	12	14	120.00	140
Е	8	12	16	150	200
	$\sum P_0 = 30$	∑P1=42	$\sum P_2 = 56$	$\sum \left(\frac{P_1}{P_0} \times 100 \right) = 686.67$	$\sum \left(\frac{P_2}{P_0} \times 100\right) = 940$

Simple Aggregative Price Index: $P_{01} = \frac{\sum p_1}{\sum P_0} \times 100 \frac{42}{30} \times 100 = 140 \text{ (for 1998)}$ $P_{02} = \frac{\sum P_2}{\sum P_0} \times 100 \frac{56}{30} \times 100 = 186.67 \text{ (for 1999)}$

Question 2

A composite price index where the prices of the item composite are weighted by their relative importance is known as the

(b) CPI

(d) None of these

(a) Price relative

(c) Weight aggregate price

Answer: C

Explanation:

Weight aggregate price index the ratio of the sum of weighted price of current and base time period multiplied by 100 is called weight aggregate price index. This index is calculated allocating weight to each commodity on the basis of their relative importance

Question 3

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A weighted aggregate price index where the weight for each item is its current period quantity is called the

(a) Aggregate index

(c) Laspeyres index

Answer: D

Explanation:

Paasche index, index developed by German economist Herman Paasche for measuring current price or quantity levels relative to those of selected base period. It differs from the Laspeyres index in that it uses current - period weight

Ouestion 4

An index that is designed to measure changes in quantities over time is known as				
(a)Quantity index	(b) Time index			
(c) Paascho indox	(d) None of these			

(c) Paasche index

(a) None of these

(b) Consumer index

(d) Paasche index

Answer: A **Explanation**:

Index number. As index number is an economic data figure reflecting price or quantity compared with a standard or base value. The base usually equals 100 and the index number is usually 100 times the ratio the base value.

Ouestion 5

Index number is expressed in:

(a) Ratio (c) Percentages (b) Squares (d) Combination

Answer: C Explanation:

Index numbers are value expressed as percentage of a single base figure. For example if annual production of a particulars. Chemical rose by 35 % output in the second year was 135% of that in the first year. Index terms, output in the two years was 100and 135 respectively. Index numbers have no units

Ouestion 6

Indices calculated by the chain base method are free from:

(a) Seasonal variation	(b)Errors
(c) Percentages	(d) Ratio
Answer: A	

Explanation:

A value in any specific time period base on the value of the same entity in the preceding period. Changes in the value can be compared between sequential time periods. This differs from a fixed base index in which value in any period are based o the initial value.

Ouestion 7

Consumer price index number is obtained by:

(a) Laspeyres formula (c) Marshall Edgeworth formula **Answer: A Explanation**:

- (b) Fisher ideal formula (d) Paasche formula
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Laspeyres formula.Laspeyres suggested this index formula in 1871, in case of calculating the price index, assuming that for individual item. Price at the base period to be $P_i 0$, and quantity at the base period to be $Q_1 0$, the following equation is called ``Laspeyres formula".

Question 8

The most appropriate average the price relatives is:(a) Median(b) Harmonic mean(c) Article mean(d) Geometric meanAnswer: D

Explanation:

Geometric mean index number is a multiplicative aggregation of (price or quantity) ratio with their importance exponents /weight derived from one or literature on index number theory

Question 9

The test which is lot obeyed by any of the weighted index numbers unless the weights are constant:

(a) Circular test(c) Factor reversal test

(b) Time reversal test(d) None of them

Answer: A Explanation:

According to this rest the product of price index must be equal to the value index Note1. Since Fisher index number satisfied both time reversal test, it is called an ideal index number, Circular test it is generalized of the time reversal test.

Question 10

Index number having upward basis is:

(a) Laspeyres index(c) Fisher`s index

(b) Paasche`s index(d) Marshall Edgeworth index

Answer: B Explanation:

Paasche index, index developed by German economist Herman Paasche for measuring current price or quantity level relative to those of a selected base period. it differs from the Laspeyres index in that uses current period weighting

Question 11

Marshall Edgeworth price index was proposed by:

(a) One English economist(b) Three English economist

(b) Two English economist(d) Many English economist

Answer: b Explanation:

The Marshall – Edge worth index credited to Marshall (1887) and Edge worth (1925) is a weight relative of current period to base period set o price This index uses the arithmetic average of the current and based period quantities for weighted it is considered a pseudo – superlative formula and is symmetric.

Question 12

Panache's price index number is also called

(a) Base year weight

(c) Simple aggregative index

(b) Current year weight(d) Consumer price index

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Answer: B

Explanation:

Passche index, index developed by German economist Herman Passche for measuring current price of quantity level to those of selected base period. it differs from the Laspeyres index in that it uses current period weight

Question 13

The major groups for whom the consu	mer price index number are constructed in India
-------------------------------------	---

(a) The industrial workers

(c) The urban agriculture

(b) The urban non- manual workers and (d) All of these

Answer: D

Explanation: Consumer price index member are having types: The industrial worker The urban non – manual worker and The agriculture labors.

Question 14

From the following data construct price index of 1995 taking 1990 as base by using Average price Relative Method:

Commodity	Α	В	С	D
Price in 1990 Rs.	60	45	80	25
Price in 1995 Rs.	75	50	70	40

(b) 12.60

(d) 12.888

(a) 120.90

(c) 809.56

Answer: A

Explanation:

Laplanation.			
Commodity	Po	P1	$\frac{P_1}{P_0} \times 100$
А	60	75	125
В	45	50	111.11
С	80	70	87.50
D	25	40	160
Total	210	235	

Question 15

Calculating weighted aggregate price index from the following data using Laspeyre's method

Base Period	Current period				
Price	Quantity Price Quantity				
А	2	10	4	5	
В	5	12	6	10	
С	4	20	5	15	
D	2	15	3	10	

(a) 155.09 (c) 135.26 **Answer: C** (b) 12.60 (d) 12.888

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Explanation:

Commodity	Price	Quantity (Q_0)	Price	Quantity	P ₀ Q ₀	P_1Q_0
Α	2	10	4	5	20	40
В	5	12	6	10	60	72
С	4	20	5	15	80	100
D	2	15	3	10	30	45
					$\sum_{n=190}^{10} P_0 Q_0$	$\sum_{=257}^{P_0Q_0}$

Laspeyre's Method

 $P_{01} = \frac{\sum P_1 Q_0}{\sum P_0 Q_0} \times 100 = \frac{257}{19} \times 100 = 135.2$

Question 16

Calculate weighted aggregate price index member from the following data by using paasches method

Commodity	Base year		Current	
	Price	Quantity	Price	Quantity
Α	10	30	12	50
В	8	15	10	25
С	6	20	6	30
D	4	10	6	20

(b) 119.79

(d) 12.888

(a) 199.79 (c) 135.26 **Answer: B Explanation:**

P_0Q_0	P_0Q_1	P_1Q_0	P_1Q_1
300	500	360	600
120	200	150	250
120	180	120	180
40	80	60	120
$\sum 580$	\sum 960	$\sum 690$	$\sum 1150$

Paasche's price index: $P_{01} = \frac{\sum P_1 Q_0}{\sum P_0 Q_1} \times 100 = 119.79$

Question 17

Calculate Laspeyres and Passche index for the following data:

Commodity	1970		1990	
	Price	Expenditure	Price	Expenditure
Α	8	100	10	90
В	10	60	11	66
С	5	100	5	100
D	3	30	2	24

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Е	2	8	4	20

(a) 109.73, 107.91

(b) 119.79, 169.56 (d) 135.26, 0.465

(c) 135.26, 0.465

Answer: A

Explanation:

Since we are given the expenditure and price we can obtain the quantity by dividing expenditure by the price for each commodity.

Commodity	19	970	19	990				
	P ₀	q_0	P ₁	q_1	P_0q_0	P_1q_0	P_0q_1	P_1q_1
А	8	12.5	10	9	100	125	72	90
В	10	6	11	6	60	66	60	66
С	5	20	5	20	100	100	100	100
D	3	10	2	12	30	20	36	24
Е	2	4	4	5	8	16	10	20
					$\sum P_0 q_0 = 298$	$\sum P_1 q_0 =$	$\sum P_0 q_1 =$	$\sum P_1 q_1 =$
						327	278	300

(i) Laspeyre's Method: $P_{01} = \frac{\sum p_1 q_0}{\sum p_0 q_0} \times 100$

- $=\frac{327}{298} \times 100$
- = 109.73

(ii) Paasche's Method: $P_{01} = \frac{\sum p_1 q_1}{\sum p_0 q_1} \times 100$

 $=\frac{300}{278} \times 100$

=107.91

Question 18

Calculate weighted average of price relative index from the following data

Item	Weight in % (Rs)	Base year Price (Rs)	Current year Price (Rs)
Α	40	2	4
В	30	5	6
С	20	4	5
D	10	2	3

(a) 215 (c) 965 Answer: B Explanation:			(b) 15 (d) 32		
Item	W	P ₀	P ₁	$R = \frac{p_1}{p_0} \times 100$	RW
А	40	2	4	$\frac{4}{2} \times 100 = 200$	8000
В	30	5	6	$\frac{6}{5} \times 100 = 120$	3600
С	20	4	5	$\frac{5}{4} \times 100 = 125$	2500
D	10	2	3	$\frac{3}{2} \times 100 = 150$	1500

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_				
	Total	$\sum \dots$		$\Sigma RW = 15600$
	Total	> W = 10		$\sum n n = 15000$

 $P_{01} = \frac{\sum RW}{\sum W} - \frac{15600}{100} - 156$

Question 19

The monthly capital expenditure incurred by worker of an industrial center during 1980 and 2005 on the following item are given below: The weights of these item are 75,10,5,6 and 4 respectively Prepare a weighted index number cost of living for 2005 with 1980as base.

Item	Price in 1980	Price in 2005
Food	100	200
Clothing	20	25
Fuel and Lighting	15	20
Music	30	40
House Rent	35	65

(a) 185	
---------	--

(c) 165

(b) 156 (d) 325

Answer: A Explanation.

Item	W	P ₀	P ₁	$\mathbf{R} = \frac{P_1}{P_0} \times$	RW
Food	75	100	200	100 200	15000
Clothing	10	20	25	125	1250
Fuel and Light	5	15	20	133.33	666.65
Music	6	30	40	133.33	799.98
House Rent	4	35	65	185.71	742.84
					∑PW=18459.47

 $CPI = \frac{\Sigma RW}{\Sigma W} = \frac{18459.47}{100} \, 184.59 = 185 \text{ (Approx)}$

Question20

An enquiry into the budget of the middle-class families in a certain city gave the following information:

Expenses on I	tem	Food	Fuel	Clothing	-	Music	
		35%	10%	20%	15%	20%	
Price in 2004 (Rs.)	1500	250	750	300	400	
Price in 1995 (Rs.)	1400	200	500	200	250	
What is the cos	st of livin	g index of 200	4 as compared	d with 1995?)		
(a) 165.62		-	(b) 1	34.5			
(c) 165.60			(d) 3	325.8			
Answer: B							
Explanation:							
Item	Win	% I	20	P ₁]	$R=\frac{p_1}{p_0}\times 100$	RW	
Food	35	14	ł00	1500	107.14	3750	
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Fuel	10	200	250	125.00	1250
Clothing	20	500	750	150.00	3000
Rent	15	200	300	150.00	2250
Music	20	250	400	160.00	3200

 $CPI = \frac{\sum RW}{\sum W} = \frac{13450}{100} = 134.5$

Question 21 Calculate the cost of living index number using family budget method

Commodities Unit	s Wheat 200	Rice 50	Pulses 56	Ghee 20	Sugar 40	Oil 50	Fuel 60	Cloths 10
consumed in Price Rs. in	1.0	3.0	4.0	20.0	2.5	10.0	2.0	15.0
Bose Price Rs. InC.	Y 1.2	3.5	5.0	30.0	5.0	15.5	2.5	18.0
(a) 166.62 (b) 136.88 (c) 165.870 (d) 325.8 Answer: B Explanation:								
Commodities	Q 0	P ₀	P ₁		$R = \frac{P_1}{P_0} \times 10$	0 W=F	$P_0 q_0 = R$	W
Wheat	200	1.0	1.2		120.00	200	24	4000
Rice	50	3.0	3.5		116.67	150	1'	75.00.5
Pulses	56	4.0	5.0		125.00	224	2	8000
Ghee	20	20.0	30.0)	150.00	400	6	0000
Sugar	40	2.5	5.0		200.00	100	20	0000
Oil	50	100	15.5	5	155.00	500	7	7500
Fuel	60	2.0	2.5		125.00	120	1	5000
Cloths	40	15.0	18.0)	120.00	600	71	2000
						∑w=	-22 Σ	RW=

 $\mathbf{CPI} = \frac{\sum RW}{\sum W} = \frac{314000.5}{2294} = 136.88$

Question 22

If the salary of person in the base year is Rs. 4,000 per annum and the current year salary is Rs. 6,000 by how much should hid salary rise to maintain the same standard of living if The CPI of the current year is 400?

(b) 13688 (d) 16000

(a)	T	U	U	U	U	
< >		-		~ •		

(c) 165870

Answer: D

Explanation:

Salary required in the current year to maintain the same standard of living of base year. Base year salary $\times \frac{CPI \ OF \ CURRENT \ YEAR}{CPI \ OF \ base \ year} = 4000 \times \frac{400}{100} \text{Rs. 16,000}$ Current year salary = Rs. 16,000

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The increase in current Year salary required = 16000- 6000 = Rs. 10,000

Question 23

Given the following data:

Year	1995-	1996-	1997-	1998-	1999-	2000-	2001-	2002-
WPI	121,6	127.2	132.8	140.7	145.7	155.7	161.3	161
(1993								
Calculate th	e inflati	on of yea	ar 1998 –	99				
(a) 5.94%				(b)	59.89%			
(c) 4.4%				(d)	None			
Answer: A								
Explanation								
Year 1996-9	$7 = \frac{X_1 - X_t}{1 - X_t}$	$\frac{1}{-i} \times 100^{-1}$	127.2-121.6	× 100 = 4.6	5%			
	Xt-	i	121.6					
Veer 1007 0	$0 - X_{1-} X_{t-}$	-i 100 ¹³	2.8-127.2	100 - 4 40	07			
Year 1997-9	$o = \frac{Xt - i}{Xt - i}$	- ×100-	127.2	$100 = 4.40^{\circ}$	70			
	V V		140 1000					
Year 1998- 9	$99 = \frac{X_t - X_t}{V}$	$\frac{t-i}{2} \times 100 =$	122.8	×5.94%				
	1		152.0					
Ouestion 2 4	ł							
What will b		al wage o	of the con	sumer if h	is monev	wages Rs.	10 and th	e cost of
living index		•			- J			0-
(a) 1900				(h)	1.901			

(a) 1900	(b) 1.901
(c) 2186	(d) 4664
Answer: B	
Explanation:	
Real wages = $\frac{Money Wage}{a}$	$\frac{2s}{10000} \times \frac{10.000}{500} \times 100 = \text{Rs. } 1.901$
Cost of living i	$ndex^{-}$ 526 x^{-} 100 $ RS. 1.901$

Question25

Index for base period is always taken as:				
(a) 100	(b) 0			
(c) 200	(d) 1			
Answer: A				

Explanation:

The index at the base period is usually scaled to 100 or 1000. for example, that the index at the chosen base period is set to 1000. if at another period is 2000 then the value indicated by the index (e.g., prices) would be estimate double what it was during the base period.

Question 26

When the prices of rice are to be co	ompared, we compute:
(a) Volume Index	(b) Value Index

(a) Volume Index	
(c) Price Index	
Answer: C	

Explanation:

Price index. Measure of relative price changes, consisting of a series of numbers are arranged so that a comparison between the values for any two period of places will show the average changes in price between period or the average difference in prices between places.

(d) Aggregate Index

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Question 27

Which formula is used in chain indices?

(a) $\frac{\sum P_n}{\sum P_o} \times 100$

Answer: B

Explanation:

In the chain index the comparison takes place always between successive calculation periods. In the chain index the changes in two calculation periods is used to take forward the index point figure of the desired base period in the chain index the weight are changed in principal in each calculation period.

Question 28

An index number that can serve purpose is called

(a) General purpose index

(c) Cost of living index

(b) Special purpose index(d) None of these

Answer: A

Explanation:

It is used measure the Changes in the wholesale price level of country over a period of time. It is used measure the changes in the cost of living of a certain selected people living in a certain locally.

(d) 109

It is very much used by the government agencies to for policies on different matter viz.

Question 29

Laspeyres index = 110, Paasche index = 108 then fisher ideal index equal to: (a) 110 (b) 108

(a) 110 (c) 100 **Answer: D Explanation:** $F = \sqrt{L \times P}$ So. $\sqrt{110 \times 108} = 109$

Question 30

Consumer price indexes are obtained by:

(a) Paasche formula(c) Marshall Edgeworth formula

(b) Fisher`s ideal formula

(d) Family budget method formula

Answer: d Explanation:

A consumer price index (CPI) measure changes in the price level of market basket of consumer goods and services purchased by household, The CPI is a statistical estimate constructed using the price of a simple of representative item whose prices are collected periodically.

Question 31

Which of the following satisfy the time reversal test? (a) $P_{01} = \frac{\sum P_1 q_0}{\sum P_0 q_0}$ (b) $P_{01} = \frac{\sum P_1 q_1}{\sum P_0 q_1}$

(a) $P_{01} = \frac{\sum P_1 q_0}{\sum P_0 q_0}$ (c) $P_{01} = \sqrt{\frac{\sum P_1 q_0}{\sum P_0 q_0}} \times \frac{\sum P_1 q_1}{\sum P_0 q_1}$

Answer: C

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(d) None



Explanation:

Factor reversal test time reversal test This test is proposed by Living fisher According to him an index number (formula) should be such that when the base year and current year are interchanged (reversed) the resulting number should be the reciprocal of the earlier.

Ouestion 32

Simple average method of relative method is equal to: (b) $\frac{\tilde{\Sigma}P_n}{\Sigma P_0} \times 100$ (d) $\frac{1}{N} \sum \left(\frac{P_n}{P_0}\right) \times 100$

(a) $\frac{P_n}{P_0} \times 100$ (c) $\sum \left(\frac{p_n}{P_0}\right) \times 100$

Answer: D

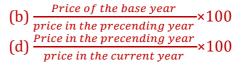
Explanation:

In case of un weighted average of relative price relative of each commodity is first calculated and then the average (mean, median, or geometric mean) of these price relatives for all the commodities is taken average of relatives can be calculated by taking arithmetic mean, geometric mean or median as average.

Ouestion 33

Link relative of current year is equal to:

- Price of the current year ×100
- price of the base year
- Price in the current year ×100 (C) $\frac{1}{price in the precending year}$



Answer: C

Explanation:

This method of finding the seasonal indices in the form of the chain relatives was

(C) $\frac{PRICE IN THE CURRENT YEAR}{PRICE IN THE PRCENDING YEAR} \times 100$

Development by Prof. Karl Person and hence this method is also known as the person method of seasonal variation Hence is correct answer.

Ouestion 34

Marshall Edge worth price index was proposed by:

- (a) Only English economist
- (c) Three English economist

(b) Two English economist (d) May English economist

Answer: B

Explanation:

The Marshall Edgeworth index credited to Marshall (1887) and Edgeworth (1925) is a weighted relative current period to base period seats of prices this index uses the arithmetic a pseudo- superlative formula and is symmetric.

Ouestion 35

Write down formula calculating inflation rate:

(a) $\frac{X_1 X_{t-1}}{X_{1-1}} \times 100$	(b) $\frac{\sum P_n q_n}{\sum P_o q_o} \times 100$
(c) $\frac{P_a}{P_{a-1}} \times 100$	(d) None
Answer: A	
Explanation:	
Inflation rate = $\frac{X_t - X_{t-i}}{x_{t-i}} \times 100$	

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Where X_t refers to WPI for the (t)thweek

X t refers to WPI for the (t - 1)th week.

Question 36

If all the values are not equal importance the index number is called

(a) Simple(c) WeightedAnswer: C

Explanation:

When all commodities are not equal importance, we assign to each commodity relative to its importance and the index computed from the weight is called weighted index number

Question 37

In fixed base method the base period should be:

(a) For away	
(c) Unreliable	

(b) Abnormal (d) Normal

(b) Un weighted

(d) None

Answer: D

Explanation:

The value in any specific time period is based on the value in the initial time period and this base remains unchanged through the index. This is different from chain base index in which values in any period are based on the preceding time period

Question 38

How many types are used in the calculation number?

(a) 2		(b) 3	
(c) 4		(d) 5	
	-		

Answer: B

Explanation:

Index number are used as an indicate the changes in economic activity they also provide framework for decision making and to period future event. There are three types of index number are generally used they are price index, quantity index, and value index.

PAST EXAMINATION QUESTIONS:

<u>MAY 2018</u>

Question 1

A series of numerical figure show the relative position is called:

(a) Index number

(c) Absolute number

(b) Relative number (d) None

Answer: A

Explanation:

A series of numerical figures which show the relative called Index Number:

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Our attack D	
Question 2 P01 is the index for time.	
P01 is the index for time:	(h) 0 on 1
(a) 1 on 0	(b) 0 on 1 (d) 0 on 0
(c) 1 on 1	(d) 0 on 0
Answer: A	
Explanation:	
P01 is the index number 1 on 0.	
Question 3	
-	$_{0}$ = 1344, $\sum P_{0} Q_{n}$ = 1880 then the Laspeyra`s
index number is:	
(a) 0. 71	(b) 1.39
(c) 1.75	(d) None
Answer: B	
Explanation:	
	$_{n}$ = 1344, $\sum P_{0} Q_{n}$ = 1880 then the Laspeyre's
index no. $\frac{\sum P_n Q_0}{\sum P_0 Q_0} = \frac{1900}{1360} = 1.3970$	
<u>Question 4</u> Price relative is expressed in term of	
-	
(a) $P = \frac{P_n}{P_0}$	$\left(b\right) I = \frac{P_n}{P_n}$
(c) $P = \frac{P_1}{P_0} \times 100$	(b) $P = \frac{P_0}{P_n}$ (d) $P = \frac{P_0}{P_n} \times 100$
Answer: C	¹ n
Explanation:	
Price relative $P = \frac{P_1}{P_0} \times 100$	
Question 5	
Circular test is satisfied by:	
(a) Laspeyre`s index number	(b) Paasche index number
(c) The simple geometric mean of price	
and the weighted aggregative weight	
Answer: C	
Explanation:	
-	eometric mean an of price relative weighted
aggregative with fixed weighted	internet internet of price relative weighted
Question 6	

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FOR ENQUIRY - 6262969604 6262969699 If the 1970 index with base 1956 is 200 and 1965 index weighted 150 the index 1970 on base 1960 will be: (a) 700 (b) 300 (c) 500 (d) 600 **Answer: B Explanation**: 1960 Let 1965 1970 Po **P**₁ **P**₂ $P_0 = \frac{P_2}{P_1} \times 100 = 150$ $\frac{P_1}{P_1} = \frac{150}{P_1}$ Index no. of 1965 with base year 1960 $P_0 = 100$ Index no of 1970 with the base 1965 $P\infty = \frac{P_2}{P} \times 100 = 200$ p_1 200 100 p_1 Multiply equation (1) (2) $\frac{P_1}{P_0} \times \frac{p_2}{p_1} = \frac{150}{100} \times \frac{200}{100}$ $P_0 p_1$ $\frac{p_2}{2} = 3$ p_0 $\frac{P_1}{P_1} = 100$ P_0 $\frac{p_2}{2} \times 100 = 3 \times 100$ p_1 $P\infty = 300$

Nov 2018

Ouestion 1

Which of the following statement is true?

on the base year quantity

(a) Passhe's is index number is based (b) Fisher index number is the arithmetic mean of Laspeyre's index number and Paasche's index number

(c) Arithmetic mean is the most appropriate average for constructing number the index number

(d) Fisher index number is an ideal index

Answer: d **Explanation**: Fisher index number is an ideal index NO.

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Question 2

It Laspeyre`s index	number is 250 and Paasche index number is 160 then Fisher
index number is:	
(a) 40,000	(b) $\frac{25}{2}$

(a) 40,000	(b) $\frac{25}{16}$
(c) 200	(d) $\frac{\frac{25}{25}}{16}$

Answer: C

Explanation:
Laspeyre`s index NO. (l) = 250
Paasche index NO. (p) = 160
Fisher index NO. (F) = $\sqrt{L \times P}$
$=\sqrt{250 \times 160}$
=\sqrt{40,000}
= 200

Question 4

If $\sum P_0 Q_0 = 240$, $\sum P_0 Q_1 = 480$, $\sum P_1 Q_0 = 600$, $\sum P_1 Q_1 = 192$ the Laspyres's index number is: (a) 250 (b) 300 (c) 350 (d) 200 Answer: A Explanation: If $\sum P_0 Q_0 = 240$, $\sum P_0 Q_1 = 480$, $\sum P_1 Q_0 = 600$, $\sum P_1 Q_1 = 192$ Laspeyra's index no. $\frac{\sum P_1 Q_0}{\sum P_0 Q_0} = \frac{600}{240} \times 100$ = 250

<u>May 2019</u>

Question 1

The prices and quantities of 3 commodities in base and current year are as follow:

P ₀	P ₁	Q ₀	Q 1	
12	14	10	20	
10	8	20	30	
8	10	30	10	
30	32	60	60	
The Laspeyres price index is:				
(a) 128. 13	(b) 107. 14			
(c) 120. 10	(d) None			
Answer: B				
Explanation:				
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	For more info	o Visit - www.KITest.in	1	

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 $LA = \frac{\sum P_1 Q_0}{\sum P_0 Q_0} \times 100$ = $\frac{32 \times 60}{30 \times 60} = \frac{1920}{1800} = 1.0777 \times 100$ = 107.4

Question 2

Which is called an ideal index number?

(a) Laspeyre's index number (c) Fisher index number (b) Paasche index number(d) Marshall Edgeworth number

Answer: C

Explanation:

the reason the fisher index is called the ideal index is twofold because the Paasche index and the Laspeyre's index. the index satisfies the time reversal test and the factor reversal test

Question 3

The most commonly used mathematical method for finding secular trend is:

(a) Moving average(c) Least squares

(b) Semi – average (d) None of these

Answer: B

Explanation:

This method is a simple and relatively objective as the free hand method the data is divided in two equal halves and the arithmetic mean of the two sets of modules of Y is plotted against the center of the relative time span It is the number of observations is even the division into halves will be straight forward

Question 4

Semi average method if the number of values is odd then we drop

(a) First value(c) Middle value

(b) Last value(d) Middle two value

Answer: C

Explanation: If the number of observations is even the division into halves will be straight forward however if the number of observations is odd then the middle most item i.e., $\binom{n+1}{2}$ is

dropped the two points so obtained are joined through a straight line which show the trend

Question 5

If Laspeyre's index is L and P Paasche	index is P then Fisher index F is $F_2 = 1 \times P$
(a) $F = L \times P$	(a) $F2=L \times P$
(c) F2 = $\sqrt{L + P}$	(d) $F = \frac{1}{L \times P}$

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Answer: B

Explanation:

If Laspeyre's index is L and Paasche index is P then Fisher index F is F2= L × p

<u>Nov 2019</u>

Question 1 Fisher`s index does not satisfy:

(a) Circular test(c) Factor reversal test

(b) Time reversal test(d) Unit test

Answer: A

Explanation:

Fisher's ideal formula for calculating index no. satisfies unit test as unit test require that the formula should be independent of the unit in which or for which prices and quantities are quoted and that is full filed by fisher1s ideal index Factor reversal test hold when the product of price index and quantity index should be equal to corresponding value index i.e.

P_1Q_1

 P_0Q_0

 $P_{01} \times Q_{01} = \frac{P_1 Q_1}{P_0 Q_0}$

Hence it is satisfied by Fisher's Ideal index

Time reversal test is a test to determine whether a given method will work both ways in time forward and backward So fisher's satisfies this test

Circular test: It is concerned with the measurement of price change over a period of year this is not met by Fisher ideal index no.

Question 2

The index number of prices at place in the year 2008 is 225 with 2004 as the base then there is

(a) 125% increase (c) 100% increase (b) 225% increase (d) 25% increase

Answer: A

Explanation: Let the index no. of price of base year be 100 Year index no. 2004 = 100 Increase = 225 – 100 = 25 So there is 125% increase.

Question 5 In semi average method if the no. of value is are exclude:

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(b) Last value (d) None

(a) First value (c) Middle value Answer: C

Explanation:

Semi average method is a method of measurement of secular trend. Under this method the whole the series data is classified into two equal parts and the average for each half are calculated. If the data is for even no. of year it is easily divided into two. If data is for odd no. of year then the middle year of the time series is left and the two halves are constituted with the period on each side of middle year.

DEC 2020

(b) Ratios

(d) Combinations

Question 1

Index Number are expressed as ____

(a) Squares

(c) Percentages

Answer: C

Explanation:

Index numbers provide a simple way of representing changes over time. Each value is expressed as a percentage of a base value which is the value that occurred in a base period. The index numbers below show how average earnings in different sectors changed between 2000 and 2006.

Question 2

If Laspeyre's index number is 110 and Fisher's ideal Index number is 109. Then Paasche's Index number is

(a) 108	(b) 110
(c) 109	(d) 118
Answer: A	
Explanation:	
Laspeyre's Index (L.I.) =110	
Paasche's Index (P.I.) =108	
Fisher's Ideal Index = $\sqrt{L. I. \times P. I.}$	
$=\sqrt{110 \times 109}$	
= 108	

<u>JAN 2021</u>

Question 1 The cost of living index is always

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 (c) Weighted index number Answer: C Explanation: The cost of living index is always Weighted general index, shows the difference in live the base city is always expressed as 100. 	 (b) Quantity index number (d) Value index number ed index number - The cost-of-living index, or ing costs between cities. The cost of living in The cost of living in the destination is then
(c) Time reversal test Answer: B Explanation:	(b) Circular Test (d) Factor reversal test
 same ratio, then the index numbers due (a) Equal (c) Reciprocal of Marshall Edge worth index number Answer: A Explanation: 	ned of all commodities are changing in the to Laspyres's and Paasche's will be (b) Unequal (d) Reciprocal of Fisher Index number of all commodities are changing in the same
July	<u>v 2021</u>
 240 to 540, what is the increase in real (a) 80 (c) 120 Answer: Options (c) Question 2 	m 120 to 180 when salary goes up from I terms? (b) 150 (d) 240 numbers for 2001 with 2000 as the base
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Commodity	Price (in ₹)		Quantities		
	2000	2001	2000	2001	
А	10	12	20	22	
В	8	8	16	18	
С	5 6 10 11				
D	4 4 7 8				
(a) 112.32	(b) 112.38				
(3) 112 2((4) 112 20				

(c) 112.26

(d) 112.20

Answer: Options (d)

Ouestion 3

The weighted aggregative price index numbers for 2001 with 2000 as the base vear using Marshal - Edge worth Number is

Commodity	Price (in ₹)		Quan	itities	
	2000	2001	2000	2001	
А	10	12	20	22	
В	8	8	16	18	
С	5 6 10 11				
D	4 4 7 8				
(a) 112.26 (c) 112.32	(b) 112.20				
(c) 112.32	(d) 112.38				

Answer: Options (a)

Question 4

The weighted aggregative price index numbers for 2001 with 2000 as the base year using Fisher's Index Number is

Commodity	Price (in ₹)		Quan	tities	
	2000	2001	2000	2001	
А	10	12	20	22	
В	8	8	16	18	
С	5	6	10	11	
D	4 4 7 8				
(a) 112.32	(b) 112.20				
(c) 112.32	(d) 112.38				

Answer: Options (d)

DEC 2021

Question 1

If P_{10} and P_{01} are index for 1 on 0 and 0 on 1 respectively then formula $P_{01} \times P_{10} =$

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1 is used for

(a) Unit test(c) Factor Reversal test

(c) Factor Reversal te

Answer:

Explanation:

 $P_{01} \times P_{10} = 1$ is used for 'Time Reversal Test'.

Question 2

The weighted averaged of price relatives of commodities, when the weights are equal to the value of commodities in the current year, yields ______ index number.

(a) Fisher's ideal

(c) Paasches

(b) Laspeyres's

(d) Marshall Edgeworth

(b) Time Reversal Test

(d) Circular Test

Answer: c

Explanation:

The weighted Averaged of Price relatives of commodities, when the weights are equal to the value of commodities in the current year yield Paasche's Index No.

Question 3

From the following data base year:

Comn	nodity	Base	Year	Current year
	Price	Quantity	Price	Quantity
Α	4	3	6	2
В	5	4	6	4
С	7	2	9	2
D	2	3	1	5
Fisher's ideal	Index is			
(a) 117.30			(b) 115.43	
(c) 118.35			(d) 116.48	}
Answer: a				
Explanation :				
Fisher's Index				
$= \sqrt{\frac{\sum P_n Q_0}{\sum P_0 Q_0} \times \frac{\sum P_n Q_n}{\sum P_0 Q_n}} \times 100$				
$-\sqrt{\sum P_0 Q_0}$	$\sum P_0 Q_n \times 100$			
$(6 \times 3) +$	$(6 \times 4) + (9 \times 4)$	$(\times 2) + (1 \times 3)$	$+(6 \times 2) + (6 \times 2)$	$5 \times 4)$
$=\sqrt{(4\times3)+}$	$(5 \times 4) + (7 \times 4)$	$\times 2) + (2 \times 3)$	$+(4 \times 2) + (5)$	$\overline{5} \times 4)$
63 59	100 = 117.3			
$=\sqrt{52} \times \frac{1}{52} \times $	100 = 11/.3			

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Question 4	
Index numbers are not helpful in	
(a) Framing economics policies	(b) Revealing trend
(c) Forecasting	(d) Identifying errors
Answer: d	
Explanation:	
Index numbers are not helpful in Identifyin	ng Errors.
Question 5	
The three index numbers, namely, Lasp	eyre, Paasche and Fisher do not satisfy
test.	
(a) Time reversal	(b) Factor reversal
(c) Unit	(d) Circular
Answer: d	
Explanation:	
Laspeyre, Paasche and Fisher donot satisfy	/ circular test.
IIINF	<u>E 2022</u>
Question 1	
Geometric mean method used in which	index number to find it out
(a) Laspeyres	(b) Paasches
(c) Fishers index Number	(d) None
Answer: c	
Explanation:	

Geometric mean Method used in Fisher's Index No to find it out.

Ouestion 2

Which test is known for shift base index no.

(a) Factor test (c) Circular test (b) Unit test (d) Time reveral test

Answer: c Explanation: Circular test is known for shift base Index No

Ouestion 3

Laspeyre and Paasche do not satisfy -

(a) Unit Test (c) Time Reversal Test Answer: c

(b) Factor Test (d) Bowley's Test

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Explanation:		
Laspeyre and paasche do not satisfy 'Time Reversal Test		
Question 4 Laspeyer's index number is based on?		
(a) Last year weight	(b) Present year weight	
(c) Last year value Answer:	(d) Present year value	
Explanation:		
Laspeyres Index Number is based on last year weight.		
Question 5		
Price relative is-	(b) P	
(a) $\frac{P_1}{P_0 \times 100}$		
(c) P_0	(d) $\frac{P_1}{P_0}$	
Answer: a		
Explanation: $P_1 \times 100$		
Price relative (R) $\frac{P_1}{P_0} \times 100$		
Question 6 Which one of the following is not approp (a) Unit Test (c) Circular Test Answer: b Explanation: Price Relative test is not appropriate for cal	(b) Price Relative Test(d) Time Reversal Test	
<u>DEC 2022</u>		
Question 1From the following data extract the index number by Laspeyre's method: $\sum P_1Q_1 = 460, \sum P_0Q_0 = 140, \sum P_1Q_0 = 350, \sum P_0Q_1 = 200$ a) 250b) 240c) 238.24d) 276.04Answer: Options (a)Explanation:Laspeyre's Price Index = $\frac{\sum P_1Q_0}{\sum P_0Q_0} \times 100$ = $\frac{350}{140} \times 100$		
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= 250

Ouestion 2

Which of the following index measures the changes from month to month in the cost of a representative "basket" of goods & services of the type which are bought by a typical household?

- a) Consumer Price Index
- c) Fisher's Index

Answer: Options (a)

Explanation:

The consumer price index (CPI), a common measure of inflation, measures the price change over time for a basket of goods and services. The basket is representative of consumer spending patterns, and the change in its price represents the rate of inflation faced by consumers as a whole.

Ouestion 3

Fisher's Index is called an ideal index number because it satisfying

- a) Factors reversal test
- c) Both factor and time reversal test
- b) Time reversal test

b) Laspeyre's Index

d) Paasche's Index

d) Circular test

Answer: Options (c)

Explanation:

Fisher's formula is called the ideal because of the following reasons:

i)It is based on geometric mean which is considered best for constructing index numbers.

ii) It fulfills both the time reversal and factor reversal tests.

iii) It takes into account both current year as well as base year's prices and quantities. iv)It is free from bias.

Question 4

If Laspeyre's Index is 119 and Paasche's Index is 112, then Fisher's Index number will be:

a) 113.99 b	o) 115.45
c) 115.89 c	d) 151.98
Answer: Options (b)	
Explanation:	
Laspeyre's Index (L.I.) =119	
Paasche's Index (P.I.) =112	
Fisher's Ideal Index = $\sqrt{L. I. \times P. I}$.	
$=\sqrt{119 \times 112}$	
= 115.45	

18.30

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Question 5 In price index, when a new commodity is required to be added, which of the following index is used? a) Shifted price index

- c) Deflating price index

- b) Splicing price index
- d) Value price Index

Answer: Options (a) Explanation: Splicing price index



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