CA Foundation

Quantitative Aptitude

(Charts & Mind maps)

Your Math's Buddy

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Dedicated To

My Mother
Seema Khedia

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Ratio Proportion & Indices

Ratio

1. If a: b = 3: 4, the value of (2a + 3b): (3a + 4b) is
(a) 54: 25 **(b)** 8: 25
(c) 17: 24 **(d)** none

2. If x: y = 3: 4, the value of $x^2y + xy^2$: $x^3 + y^3$ is
(a) 13: 12 **(b)** 12: 13
(c) 21: 31 **(d)** none

3. If p: q is the sub-duplicate ratio of p-x^2: q-x^2 then x^2 is
(a) $\frac{p}{p+q}$ (b) $\frac{q}{p+q}$
(c) $\frac{pq}{p+q}$ (d) none

4. The ratio compounded of 2: 3, 9: 4, 5: 6 and 8: 10 is
(a) 1: 1 **(b)** 1: 5
(c) 3: 8 **(d)** none

5. The angles of a triangle are in ratio 2: 7: 11. The angles are
(a) (20^o, 70^o, 90^o) **(b)** (30^o, 70^o, 80^o)
(c) (18^o, 63^o, 99^o) **(d)** none

6. Division of Rs. 324 between X and Y is in the ratio 11: 7. X & Y would get Rupees
(a) (204, 120) **(b)** (200, 124)
(c) (180, 144) **(d)** none

7. Anand earns Rs. 80 in 7 hours and Pramod Rs. 90 in 12 hours. The ratio of their earnings is
(a) 30: 21 **(b)** 23: 1
(c) 8: 9 **(d)** none

8. If a carton containing a dozen mirrors is dropped, which of the following cannot be the ratio of broken mirrors to unbroken mirrors
(a) 2:1 (b) 3:1
(c) 3:2 (d) 7:5

Proportion

8. The mean proportional between 25, 81 is
(a) 40 **(b)** 50
(c) 45 **(d)** none

9. The fourth proportional to 2a, a2, c is
(a) ac/2 **(b)** ac
(c) 2/ac **(d)** none

10. If four numbers ½, 1/3, 1/5, 1/x are proportional then x is
(a) 6/5 **(b)** 5/6
(c) 15/2 **(d)** none

11. If $\frac{a}{4} = \frac{b}{5} = \frac{c}{9}$ then $\frac{a+b+c}{c}$ is
(a) 4 **(b)** 2
(c) 7 **(d)** none

12. The sum of the ages of 3 persons is 150 years. 10 years ago, their ages were in the ratio 7: 8: 9. Their present ages are
(a) (45, 50, 55) **(b)** (40,60,50)
(c) (35, 45, 70) **(d)** none

13. If a: b = 4: 1 then $\sqrt{\frac{a}{b}} + \sqrt{\frac{b}{a}}$ *is*
(a) 5/2 **(b)** 4
(c) 5 **(d)** none

14. If a,b,c,d,e are in continued proportion then abde is equal to
(a) a^4 (b) b^4
(c) c^4 (d) d^4

15. If a: b = c: d = e: f = 2:5, Then value of $\frac{4a + 15c + 29e}{4b + 15d + 29f}$ is
(a) 2:4 (b) 1:5
(c) 4:5 **(d) 2:5**

16. If $\frac{\sqrt{2-x} + \sqrt{2+x}}{\sqrt{2-x} - \sqrt{2+x}} = 3$, then x is equal to
(a) -6/5 (b) -5/6
(c) -1/5 (d) 6/5

Indices

14. The value of $(8/27)^{1/3}$ is
(a) 2/3 **(b)** 3/2
(c) 2/9 **(d)** none

15. The value of $(\frac{243}{32})^{-4/5}$ is:
(a) 18/16 **(b)** 16/81
(c) 4/9 **(d)** 9/4

16. The value of $[(10)^{150} \div (10)^{146}]$ is:
(a) 1000 **(b)** 10000
(c) 100000 **(d)** $(10)^6$

17. $\left(\frac{x^b}{x^c}\right)^{(b+c-a)} \cdot \left(\frac{x^c}{x^a}\right)^{(c+a-b)} \cdot \left(\frac{x^a}{x^b}\right)^{(a+b-c)} = x$ then the value of x is :
(a) x^{abc} **(b)** 1
(c) $x^{ab+bc+ca}$ **(d)** x^{b+c+a}

18. If $2^x = 4^y = 8^z$ and $\left(\frac{1}{2x} + \frac{1}{4y} + \frac{1}{6z}\right) = \frac{24}{7}$, then the value of z is:
(a) $\frac{7}{16}$ **(b)** 7/32
(c) 7/48 **(d)** 7/64

19. If $2^x = 3^y = 6^{-z}$ then value of $\left(\frac{1}{x} + \frac{1}{y} + \frac{1}{z}\right)$ *is* :
(a) 0 **(b)** 1
(c) 3/2 **(d)** – (1/2)

20. $\sqrt{11 + 4\sqrt{7}} - \sqrt{11 - 4\sqrt{7}}$ =
(a) 8 **(b)** 2
(c) 6 **(d)** 4

21. If $x = p^{1/3} - p^{-1/3}$, then
(a) $x^3 + 3x = p + (1/p)$
(c) $x^3 + 3x = p + 1$
(b) $x^3 + 3x = p - (1/p)$
(d) none

Misc.

22. Sugar at rate Rs. 15 per kg is mixed with sugar at rate Rs. 20 per kg in the ratio 2:3. Find the price per kg of the mixture
(a) 18 **(b)** 28
(c) 20 **(d)** 15

23. An alloy is to contain copper and zinc 9: 4. The zinc required to melt with 24 kg of copper is:
(a) $10\frac{2}{3}$ **kg** (b) $10\frac{1}{3}$kg
(c) $9\frac{2}{3}$kg (d) 9 kg

24. A dealer mixes Tea costing Rs 6.92 per kg with Tea costing Rs 7.77 per kg and sells the mixture at Rs 8.80 per kg and earns a profit 17.5% on his sale price. In what proportion does he mix them?
(a) 1: 2 (b) 4: 1
(c) 3: 4 (d) 5: 3

25. Gold is 19 times as heavy as Water and Copper is 9 times as heavy as Water. In what ratio should these be mixed to get an alloy 15 times as heavy as water?
(a) 1: 1 (b) 2: 3
(c) 1: 2 **(d) 3: 2**

26. If $x = \sqrt{2 - \sqrt{2 - \sqrt{2}}} \ldots \alpha$ the value of x is given by
(a)-2 (b) 1
(c) 2 (d) 0

27. If $2^{x^2} = 3^{y^2} = 12^{z^2}$ then
(a) $\frac{1}{x^2} + \frac{1}{y^2} = \frac{1}{z^2}$ (b) $\frac{1}{x^2} + \frac{2}{y^2} = \frac{1}{z^2}$
(c) $\frac{2}{x^2} + \frac{1}{y^2} = \frac{1}{z^2}$ (d) None

Previous Year Questions

Level-1

June-2009

If $x = 3^{1/3} + 3^{-1/3}$ then find value of $3x^3 - 9x$
(a) 3 (b) 9
(c) 12 **(d) 10**

Dec-2009

If $2^x \times 3^y \times 5^z = 360$ Then what is the value of x, y, z,?
(a) 3,2,1 (b) 1,2, 3
(c) 2, 3, 1 (d) 1,3,2

June-2010

The students of two classes are in the ratio 5:7, if 10 students left from each class, the remaining students are in the ratio of 4: 6 then the number of students in each class is:
(a) 30, 40 (b) 25, 24
(c) 40, 60 **(d) 50, 70**

June-2011

In a film shooting, A and B received money in a certain ratio and B and C also received the money in the same ratio. If A gets Rs. 1,60,000 and C gets Rs. 2,50,000. Find the amount received by B?
(a) Rs. 2,00,000 (b) Rs. 2,50,000
(c) Rs. 1,00,000 (d) Rs. 1,50,000

Dec-2011

If X Varies inversely as square of Y and given that Y = 2 for X = 1, then the Value of X for Y = 6 will be:
(a) 3 (b) 9
(c) 1/3 **(d) 1/9**

Level-2

Dec-2013

If $\sqrt[3]{a} + 3\sqrt{b} + 3\sqrt{c}$ then the value of $\left(\frac{a+b+c}{3}\right)^3 = 0$
(a) abc (b) 9abc
(c) $\frac{1}{abc}$ (d) $\frac{1}{9abc}$

June-2014

If the salary of P is 25% lower than that of Q and the salary of R is 20% higher than that of Q, the ratio of the salary of R and P will be:
(a) 5: 8 **(b) 8: 5**
(c) 5:3 (d) 3: 5

June-2015

A dealer mixes rice costing Rs. 13.84 per Kg. with rice costing Rs. 15.54 and sells the mixture at Rs. 17.60 per Kg. So, he earns a profit of 14.6% on his sale price. The proportion in which he mixes the two qualities of rice is:
(a) 3: 7 (b) 5: 7
(c) 7:9 (d) 9: 11

June-2015

The value of $\frac{2^n+2^{n-1}}{2^{n+1}-2^n}$ is:
(a) $\frac{1}{2}$ **(b)** $\frac{3}{2}$ (c) $\frac{2}{3}$ (d) 2

Dec-2016

If abc = 2, then the value of $\frac{1}{1+a+2b^{-1}} + \frac{1}{1+\frac{1}{2}b+c^{-1}} + \frac{1}{1+c+a^{-1}}$ is:
(a) 1 (b) 2 (c) 3 (d) $\frac{1}{2}$

Level-3

June-2017

If $a = \frac{\sqrt{6}+\sqrt{5}}{\sqrt{6}-\sqrt{5}}$ and $b = \frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}}$ then the value of $\frac{1}{a^2} + \frac{1}{b^2}$ is equal to:
(a) 480 **(b) 482** (c) 484 (d) 486

Nov-2018

$\frac{3x-2}{5x+6}$ is the duplicate ratio of $\frac{2}{3}$ then find the value of x:
(a) 2 **(b) 6** (c) 5 (d) 9

Nov-2018

$$\frac{2^{m+1} \times 3^{2m+n+3} \times 5^{n-m+4} \times 6^{2n+m}}{6^{2m+n} \times 10^{n+1} \times 15^{m+3}}$$

(a) 3^{2m+2n} (b) 3^{2n-2m}
(c) 1 (d) None

Nov-2018

If x: y: z = 7: 4: 11 then $\frac{x+y+z}{z}$ is:
(a) 2 (b) 3 (c) 4 (d) 5

Nov-2018

If $x = \sqrt{3} + \frac{1}{\sqrt{3}}$ then $\left(x - \frac{\sqrt{126}}{\sqrt{42}}\right)\left(x - \frac{1}{x-\frac{2\sqrt{3}}{3}}\right)$ =?
(a) 5/6 (b) 6/5 (c) 2/3 (d) - 3/5

Nov-2019

Value of $\left[9^{n+\frac{1}{4}} \cdot \frac{\sqrt{3.3^n}}{3\cdot\sqrt{3^{-n}}}\right]^{\frac{1}{n}}$
(a) 9 **(b) 27**
(c) 81 (d) 3

Logarithm

Basics

1. $\log_2 8$ is equal to
(a) 2 **(b)** 8
(c) 3 **(d)** none

2. $\log_{2\sqrt{3}} 1728$ is equal to
(a) $2\sqrt{3}$ **(b)** 2
(c) 6 **(d)** none

3. The value of log 0.0001 to the base 0.1
(a) – 4 **(b)** 4
(c) ¼ **(d)** none of these

4. If $\log x + \log y = \log (x+y)$, y can be expressed as
(a) x - 1 **(b)** x
(c) x/x-1 **(d)** none

5. If $\log_2 x + \log_4 x + \log_{16} x = 21/4$, then x is equal to
(a) 8 **(b)** 4
(c) 16 **(d)** none of these

6. The simplified value of $2\log_{10}5 + \log_{10} 4$ is
(a) ½ **(b)** 4
(c) 2 **(d)** none

7. If $2 \log x = 4 \log 3$, the x is equal to
(a) -4 **(b)** 9
(c) 2 **(d)** none of these

8. log 0.0625 to the base 2 is equal to
(a) 4 **(b)** 5
(c) 1 **(d)** none of these

9. $\log \frac{a^2}{bc} - \log \frac{ca}{b^2} + \log \frac{c^2}{ab} =$
(a) 0 **(b)** 1
(c) log a **(d)** None of these.

10. The value of
$16\log \frac{64}{60} + 12 \log \frac{50}{48} + 7 \log \frac{81}{80} + \log 2$
(a) 0 **(b) 1** **(c)** 2 **(d)** -1

Finding Value Problem

8. Given log2 = 0.3010 and log3 = 0.4771 the value of log 6 is
(a) 0.9030 **(b)** 0.9542
(c) 0.7781 **(d)** none

9. Given that $\log_{10}2 = x$ & $\log_{10}3 = y$, the value of $\log_{10}60$ is expressed as
(a) x – y + 1 **(b)** x + y +1
(c) x – y - 1 **(d)** None of these

10. Given that $\log_{10}2 = x$, $\log_{10}3 = y$, then $\log_{10}1.2$ is expressed in terms of x and y as
(a) x + 2y + 1 **(b)** x + y – 1
(c) 2x + y - 1 **(d)** None

11. Given that $\log x = m + n$ and $\log y = m - n$, the value of **$\log 10x/y^2$** is expressed in terms of m and n as
(a) 1 – m + 3n **(b)** m – 1 + 3n
(c) m + 3n + 1 **(d)** None

Advance Problems

24. If $\log (a) = \frac{1}{2}\log (b) = \frac{1}{5} logc$ then value of $a^4b^3c^{-2}$ is
(a) 0 **(b)** 1
(c) -1 **(d)** None

25. If $x^{18} = y^{21} = z^{28}$, then 3,3 $\log_y x$, 3 $\log_z y$, 7 $\log_x z$ are in:
(a) A. P **(b)** G. P
(c) H. P **(d)** None

Chain Based Problem

12. The value of $\log_2 \log_2 16$
(a) 0 **(b)** 2
(c) 1 **(d)** none

13. The value of
$\log_2 [\log_2 \{\log_3 (\log_3 27^3)\}]$ is equal to
(a) 1 **(b)** 2
(c) 0 **(d)** none

14. On solving the equation
$\log_3 [\log_2(\log_3 t)] = 1$ we get the value of t as
(a) 8 **(b)** 18
(c) 81 **(d)** 6561

15. On solving the equation
$\log_{1/2}[\log_t (\log_4 32)] = 2$ we get the value of t as
(a) $5/2$ **(b)** $25/4$
(c) $625/16$ **(d)** None

Assuming Value Problem

21. For any three consecutive integers $x\,y\,z$ the equation **$\log (1+xz) - 2\log y = 0$** is
(a) True **(b)** False

22. If $x = \log_a bc$, $y = \log_b ca$, $z = \log_c ab$ then the value of xyz – x – y – z is
(a) 0 **(b)** 1
(c) -1 **(d)** 2

23. If $\log_x yz = p$, $\log_y zx = q$, $\log_z xy = r$,
Then $\frac{1}{p+1} + \frac{1}{q+1} + \frac{1}{r+1} =$ is
(a) 0 **(b)1** **(c)** 2 **(d)** None

Base Changing Theorem

16. $\frac{1}{\log_{ab}(abc)} + \frac{1}{\log_{bc}(abc)} + \frac{1}{\log_{ca}(abc)}$ is equal to
(a) 0 **(b)** 1
(c) 2 **(d)** -1

17. $\frac{1}{1+\log_a(bc)} + \frac{1}{1+\log_b(ca)} + \frac{1}{1+\log_b(ab)}$ is equal to
(a) 0 **(b)** 1
(c) 3 **(d)** -1

18. $\log_b\left(a^{\frac{1}{2}}\right).\log_c(b^3).\log_a(c^{\frac{2}{3}})$ is equal to
(a) 0 **(b)** 1
(c) -1 **(d)** None

Principle Identity

19. The value of $16^{\log_4 5}$ is
(a) 15 **(b)** 40
(c) 20 **(d)** 25

20. The value of the expression
$a^{\log_a b.\log_b c.\log_c d.\log_d t}$
(a) t
(b) abcdt
(c) (a + b + c + d + t)
(d) none

Cyclic Order

26. If p + q + r = 0, find the value of
$\frac{1}{a^q+a^{-r}+1} + \frac{1}{a^r+a^{-p}+1} + \frac{1}{a^p+a^{-q}+1}$
(a) **(b)** 2
(c) 1 **(d)** None

Previous Year Questions

Level-1

June-2009

1. $\log_4 (x^2 + x) - \log_4(x+1) = 2$. Find x
(a) 16 (b) 0
(c) -1 (d) None of these.

Dec-2009

2. Find the value of
$[\log_{10} \sqrt{25} - \log_{10} (2)^3 + \log_{10} (4)^2]^x$
(a) x (b) 10
(c) 1 (d) None.

Dec-2010

The value of
$2 \log x + 2 \log x^2 + 2 \log x^3 + \text{--------} + 2 \log x^n$ will be:
(a) $\frac{n(n+1)\log x}{2}$ (b) n (n + 1) log x
(c) $n^2 \log x$ (d) None of these.

June-2011

If n = m! where ('m' is a positive integer > 2) then the value of:
$\frac{1}{\log_2^n} + \frac{1}{\log_3^n} + \frac{1}{\log_4^n} + \ldots\ldots + \frac{1}{\log_m^n}$
(a) 1 (b) 0
(c) -1 (d) 2

June-2012

If $\log_x y = 100$ and $\log_2 x = 10$, then the value of 'y' is
(a) 2^{10} (b) 2^{100}
(c) $2^{1,000}$ (d) $2^{10,000}$

Level-2

June-2013

For what value of x, the equation $(\log_{\sqrt{x}} 2)^2 = \log_x^2$ is true?
(a) 16 (b) 32
(c) 8 (d) 4

June-2014

The value of $\log_4 9 . \log_3 2$ is:
(a) 3 (b) 9
(c) 2 (d) 1

June-2014

If $x^2 + y^2 = 7xy$, then $\log \frac{1}{3}(x + y)$ = _____.
(a) (log x + log y) (b) $\frac{1}{2}$ (log x + log y)
(c) $\frac{1}{3}$ (log x / log y) (d) $\frac{1}{3}$ (log x + log y)

June-2014

If $x = 1 + \log_p qr$, $y = 1 + \log_0 rp$ and $z = 1 + \log_r pq$ then the value of $\frac{1}{x} + \frac{1}{y} + \frac{2}{z}$ = _____
(a) 0 (b) 1 .
(c) -1 (d) 3

June-2017

The value of **log ($1^3 + 2^3 + 3^3 + \ldots\ldots n^3$)** is equal to:
(a) 3 log 1 + 3 log 2 + ... + 3 log n
(b) 2 log n + 2 log (n+1) - 2 log 2
(c) log n + log (n+1) + log (2n+1) - log 6 (1 mark)
(d) 1

Level-3

May-2018

The value of the expression: $a^{\log_a b \cdot \log_b^c \cdot \log_c^d \cdot \log_d t}$
(a) t (b) abcdt
(c) (a + b + c + d + t) (d) None

May-2018

The value of the expression: $a^{\log_a b \cdot \log_b^c \cdot \log_c^d \cdot \log_d t}$
(a) t (b) abcdt
(c) (a + b + c + d + t) (d) None

June-2019

The value of
$\log_5, \left(1 + \frac{1}{5}\right) + \log_5 \left(1 + \frac{1}{6}\right) + \text{----} + \log_5, \left(1 + \frac{1}{624}\right)$
(a) 2 (b) 3
(c) 5 (d) 0

June-2019

$\log_{2\sqrt{2}} (512) : \log_{3\sqrt{2}} 324 =$
(a) 128 : 81 (b) 2 : 3
(c) 3 : 2 (d) None

Dec-21

Find the value of $\log(x^6)$, if $\log(x) + 2 \log(x^2) + 3 \log(x^3) = 14$,
(a) 3 (b) 4
(c) 5 (d) 6

Equations

Linear Equations

3. The value of y that satisfies the equation $\frac{y+11}{6}-\frac{y+1}{9}=\frac{y+7}{4}$ is
(a)-1 **(c)** 1
(b)7 **(d)** $-\frac{1}{7}$

4. The equation $\frac{12x+1}{4}=\frac{15x-1}{5}+\frac{2x-5}{3x-1}$ is true or
(a)x = 1 **(c)** x = 5
(b)x = 2 **(d)** x = 7

5. 1.5x + 3.6y = 2.1, 2.5(x +1) = 6y
(a) (0.2, 0.5) **(c)** (2, 5)
(b) (0.5, 0.2) **(d)** (-2, -5)

6. $\frac{xy}{x+y}=20,\frac{yz}{y+z}=40,\frac{zx}{z+x}=24$
(a) (120,60, 30) **(c)** (30, 120, 60)
(b) (60, 30, 120) **(d)** (30, 60, 120)

7. Solving $\frac{1}{x^2}+\frac{1}{y^2}-13=0$and $\frac{1}{x}+\frac{1}{y}-5=0$we get the roots as under
(a) $\frac{1}{8},\frac{1}{5}$
(b) $\frac{1}{2},\frac{1}{3}$
(c) $\frac{1}{13},\frac{1}{5}$
(d) $\frac{1}{4},\frac{1}{5}$

8. Solving $4^x.2^y=128$ and $3^{3x+2y}=9^{xy}$ we get the following roots
(a) $\frac{7}{4},\frac{7}{2}$ **(b)** 2,3
(c) 1,2 **(d)** 1,3

Quadratic Equation

14. Solution of equ $3x^2-17x+24=0$ are
(a)(2, 3) **(c)** $(3, 2\frac{2}{3})$
(b)$(2, 3\frac{2}{3})$ **(d)** $(3, \frac{2}{3})$

15. If x = m is one of the solutions of the equation $2x^2 + 5x - m = 0$ the possible values of m are
(a)(0, 2) **(c)** (0, 1)
(b)(0, -2) **(d)** (1, -1)

16. If the roots of the equation $2x^2 + 8x - m^3 = 0$ are equal then the value of m is
(a)– 3 **(c)** 1
(b)– 1 **(d)** – 2

17. The roots of equation $x^2+(2p-1)x+p^2=0$ are real if
(a)P ≥ 1 **(c)** p ≥ ¼
(b)P ≤ 4 **(d)** p ≤ ¼

18. If αβ be the roots of the equation $2x^2 - 4x - 3 = 0$ the value of $\alpha^2 + \beta^2$ is
(a)5 **(c)** 3
(b)7 **(d)** -4

19. If α and β are the roots of $x^2 = x + 1$ then the value of $\frac{\alpha^2}{\beta}-\frac{\beta^2}{\alpha}$ is
(a)$2\sqrt{5}$ **(c)** $3\sqrt{5}$
(b)$\sqrt{5}$ **(d)** $-2\sqrt{5}$

20. If α and β be the roots of the equation $x^2+3x+4=0$, then find the equation whose roots are $(\alpha+\beta)^2$ and $(\alpha-\beta)^2$
(a) $x^2 - 2x - 63 = 0$
(c) $x^2 - 2x + 63 = 0$

Quadratic Advance Problem

1. The values of $4+\frac{1}{4+\frac{1}{4+\frac{1}{4+\cdots\infty}}}$
(a)$1\pm\sqrt{2}$ **(c)** $2\pm\sqrt{5}$
(b)$2+\sqrt{5}$ **(d)** none of these

2. If the sum of the roots of the quadratic equation $ax^2 + bx + c = 0$ is equal to the sum of the squares of their reciprocals then $\frac{b^2}{ac}+\frac{bc}{a^2}$ is equal to
(a)2 **(c)** 1
(b)-2 **(d)** -1

Cubic Equations

21. The cubic equation $x^3 + 2x^2 - x - 2 = 0$ has 3 roots namely.
(a)(1, -1, 2) **(c)** (-1, 2, -2)
(b)(-1, 1, -2) **(d)** (1, 2, 2)

22. Factors of the equation $3x^2 + 5x^2 - 3x - 5 = 0$ are
(a) $x-1, x-2, x-5/3$
(b) $x-1, x+1, 3x+5$
(c) $x+1, x-1, 3x-5$
(d) $x-1, x+1, x-2$

Word Problems

9.Monthly income of two persons are in the ratio 4: 5 and their monthly expenses are in the ratio 7: 9. If each saves Rs 50 per month find their monthly income.
(a)(500, 400) **(c)** (300, 600)
(b)(400, 500) **(d)** (350, 550)

10. The age of a person is twice the sum of the ages of his two sons and five years ago his age was thrice the sum of their ages. Find his present age.
(a)60 years **(c)** 51 years
(b)52 years **(d)** 50 years

11. The hypotenuse of a right-angled triangle is 20 cm. the difference between its other two sides be 4 cm. the sides are
(a)(11cm, 15cm) **(c)** (20cm, 24cm)
(b)(12cm, 16cm) **(d)** none

12. The sides of an equilateral triangle are shortened by 12 units, 13 units and 14 units respectively and a right-angle triangle is formed. The sides of the equilateral triangle is
(a)17 units **(c)** 15 units
(b)16 units **(d)** 18 units

13. The sum of two irrational numbers multiplied by the larger one is 70 and their difference is multiplied by the smaller one is 12; the two numbers are
(a)$3\sqrt{2}, 2\sqrt{3}$ **(c)** $2\sqrt{2}, 5\sqrt{2}$
(b)$5\sqrt{2}, 3\sqrt{5}$ **(d)** none of these

Previous Year Questions

Level-1

Dec-2010

Positive value of 'k' for which the roots of equation $12x^2 + kx + 5 = 0$ are in ratio 3:2, is:
(a) 5/12 (b) 12/5
(c) $\frac{5\sqrt{10}}{2}$ **(d) $5\sqrt{10}$**

June-2011

If roots of equation $x^2 + x + r = 0$ are 'α' and 'β' and $\alpha^3 + \beta^3 = -6$. Find the value 'r'?
(a) $\frac{-5}{3}$ (b) $\frac{7}{3}$
(c) $\frac{-4}{3}$ (d) 1

Dec-2011

If p & q are the roots of the Equation x^2- bx + C = 0, then what is the Equation whose roots are (pq + p + q) and (pq - p - q)?
(a) x^2-2cx + c^2-b^2 = 0 (b) x^2 - 2bx + c^2 + b^2 = 0
(c) $8cx^2$ - 2(b + c)x + c^2 = 0 (d) x^2 + 2bx - (c^2 - b^2) = 0

June-2012

If one of the roots of the equation $x^2 + px + \underline{a}$ is $\sqrt{3}$+2, then the value of 'p' and '$\underline{a}$' is:
(a) - 4, -1 (b) 4, -1
(c) – 4, 1 (d) 4, 1

Dec-2012

If |x - 2| + |x - 3| = 7 then, 'x' will be equal to
(a) 6 (b) -1
(c) 6 and – 1 (d) None of the above

Level-2

Dec-2013

A seller makes an offer of selling certain articles that can be described by the equation x = 25 - 2y where 'x' is the price per unit and 'y' denotes the number of units. The cost price of the article is Rs. 10 per unit. The maximum quantity that can be offered in a single deal to avoid loss is _____.
(a) 6 **(b) 7** (c) 8 (d) 9

June-2016

If difference between the roots of the equation $x^2 – kx + 8 = 0$ is 4, then the value of K is:
(a) 0 (b) ±4 (c) $\pm 8\sqrt{3}$ **(d) $\pm 4\sqrt{3}$**

June-2017 **May-2018** **Nov-2018**

If α, β are the roots of the 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) $\frac{14}{5}$**

Dec-2017

The difference between the roots of the equation $x^2 – 7x - 9 = 0$ is:
(a) 7 **(b) $\sqrt{85}$** (c) 9 (d) $2\sqrt{85}$

Dec-2017

If $u^{5x} = v^{5y} = w^{5z}$ and $u^2 = vw$, then the value of xy + xz - 2yz will be:
(a) 5 (b) 2 (c) 1 **(d) 0**

June-2019

Find the condition that one roots is double the other of $ax^2 + bx + c = 0$
(a) 2 b^2 = 3ac **(b) $2b^2 = 9ac$**

Level-3

Jan-2021

The value of P for which the difference between the root of equation $x^2 + px + 8 = 0$ is 2
(a) ±2 (b) ±4 **(c) ±6** (d) ±8

Jan-2021

If the quadratic equation $x^2 + px + q = 0$ and $x^2 + qx + p = 0$ have a common root then p + q = ?
(a) 0 (b) 1 **(c) -1** (d) 2

Jan-2021

The harmonic mean of the roots of the equation $(5 + \sqrt{2})$ x 2 - $(4 + \sqrt{5})$x + 8 + $2\sqrt{5}$ = 0 is
(a) 2 **(b) 4** (c) 6 (d) 8

July-2021

If 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 of the following is true?
(a) $k^2 + 3k - 2 = 0$ (b) k^2-2k+ 3 = 0
(c) k^2-2k-3 = 0 **(d) $k^2 - 3k + 2 = 0$**

July-2021

The sum of square of any real positive quantity and its reciprocal is never less than:
(a) 1 **(b) 2** (c) 3 (d) 4

Dec-2021

If one root is half of the other of a quadratic equation and the difference in roots is a, then the equation is
(a) $x^2 + ax + 2a^2 = 0$ **(b) $x^2 - 3ax + 2a^2 = 0$**

Linear Inequalities

Formation of Inequality

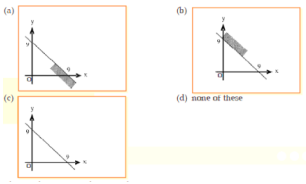
6. An employer recruits experienced (x) and fresh workmen (y) for his firm under the condition that he cannot employ more than 9 people. X and y can be related by the inequality
(a) $X + y \neq 9$
(b) $x + y \geq 9, x \geq 0, y \geq 0$
(c) $x + y \leq 9, x \geq 0, y \geq 0$
(d) none of these

7. On the average experienced person does 5 units of work while a fresh one 3 units of work daily but the employer has to maintain an output of al least 30 units of work per day. This situation can be expressed as
(a) $5x + 3y \leq 30$
(b) $5x + 3y \geq x \geq 0, y \geq 0$
(c) $5x + 3y > 30$
(d) none of these

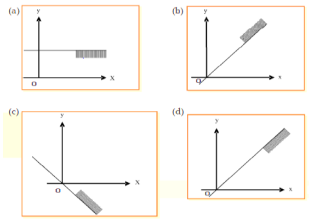
8. The rules and regulations demand that the employer should employ not more than 5 experienced hands to 1 fresh one and this fact can be expressed as
(a) $Y \geq x/5$ **(c)** $5y \geq x$
(b) $5y \leq x$ **(d)** none

Inqⁿ is Given Graph is asked

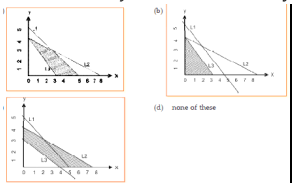
3. The graph to express the inequality $x + y \leq 9$ is



4. The graph to express the inequality $y \leq \left(\frac{1}{2}\right) x$ is indicated by

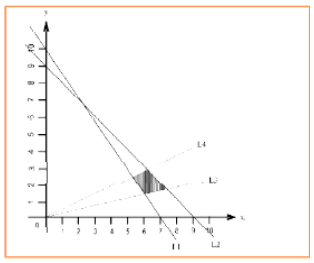


5. The common region satisfying the set of inequalities$x \geq 0, y \geq 0$,
L1 : $x + y \leq 5$, **L2** : $x + 2y \leq 8$ and
L3 : $4x + 3y \geq 12$ is indicated by



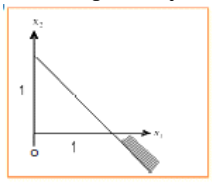
Graph is given Inqⁿ is asked

1. The common region (shaded part) shown in the diagram refers to



Ans:

2. The region is expressed as



(a) $X_1 - x_2 \geq 1$
(b) $X_1 + x_2 \leq 1$
(c) $\mathbf{X_1 + x_2 \geq 1}$
(d) None of these

Finding Solution

9.On solving the inequalities $6x + y \geq 18$, $x + 4y \geq 12$, $2x + y \geq 10$, we get the following situation
(a) (0, 18), (12, 0), (4, 2) and (2, 6)
(b) (3, 0), (0, 3), (4, 2) and (7, 6)
(c) (5, 0), (0, 10), (4, 2) and (7, 6)
(d) (0, 18), (12, 0), (4, 2), (0, 0) and (7, 6)

Coverage of Inequality

10. If $\left|x + \frac{1}{4}\right| > \frac{7}{4}$, then:
(a) $x < \frac{-3}{2}$ or $x > 2$ **(b)** $x < -2$ or $x > \frac{3}{2}$
(c) $-2 < x < \frac{3}{2}$ **(d)** none of these

11. The common region represented by the inequalities $2x + y \geq 8$, $x + y \geq 12$, $3x + 2y \leq 34$ is
(a) Unbounded
(b) In feasible
(c) Feasible and bounded
(d) Feasible and unbounded

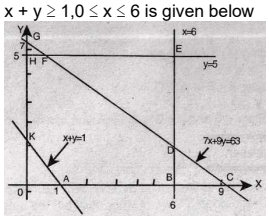
12. If $a > 0$ and $b < 0$, it followings that:
(a) $\frac{1}{a} > \frac{1}{b}$ **(b)** $\frac{1}{a} < \frac{1}{b}$
(c) $\frac{1}{a} = \frac{1}{b}$ **(d)** none of these

Previous Year Questions

Level-1

June-2014

The graph of linear inequalities $7x + 9y \le 63$, $x + y \ge 1, 0 \le x \le 6$ is given below

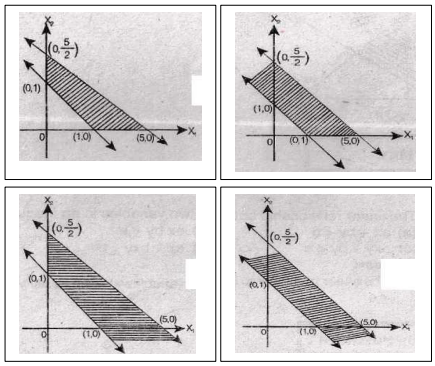


Common region of the inequalities is:

(a) BCDB and DEFD (b) Unbounded
(c) HFGH **(d) ABDFHKA**

June-2017

The common region by the inequalities $x_1 + 2x_2 \le 5$, $x_1 + x_2 \ge 1$ $x_1 \ge 0$, $x_2 \ge 0$ is given as shaded portion in:



Level-2

Nov-2019

On solving the inequalities; $6x + y \ge 18$, $x + 4y \ge 12$, $2x + y \ge 10$we get

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

Nov-2020

Solve for x of the Inequalities
$2 \le \frac{3x-2}{5} \le 4$ where $x \leftarrow N$
(a) {5, 6, 7}
(b) {3, 4, 5, 6}
(c) {4, 5, 6}
(d) None

Jan-2021

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

Jan-2021

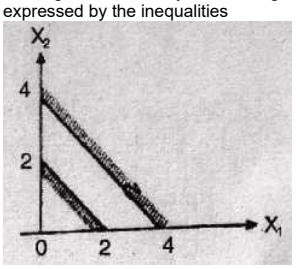
XVZ Company has a policy for its recruitment as: it should not recruit more than eight men (x) to three women (y). How can this fact be expressed in inequality?

(a) $3y \ge 8x$ (b) $3y \le x/8$
(c) $8y \ge 3x$ (d) $8y \le 3x$

Level-3

Dec-2022

The region indicated by the shading in the graph is expressed by the inequalities



(a) $x_1 + x_2 \le 2$;
$x_1 + x_2 \ge 4$;
$x_1 \ge 0$, $x_2 \ge 0$

(b) $x_1 + x_2 \le 2$;
$x_2 x_1 + x_2 \le 4$;
$x_1 \ge 0$, $x_2 \ge 0$

(c) $x_1 + x_2 \ge 2$;
$x_1 + x_2 \ge 4$;
$x_1 \ge 0$, $x_2 \ge 0$

(d) $x_1 + x_2 \le 2$;
$x_1 + x_2 \ge 4$;
$x_1 \ge 0$, $x_2 \ge 0$

Dec-2022

If $2x + 5 > 3x + 2$ and $2x - 3 <= 4x - 5$, the 'x' can take which of the following values?

(a) 4 (b)-4
(c) 2 (d)-2

Time Value of Money

Simple Interest

9. S.I on Rs. 3500 for 3 years at 12% per annum is
(a) Rs. 1200 **(b)** 1260
(c) 2260 **(d)** none of these

10. A certain sum of money trebles itself in 10 years at a certain rate of S.I. p.a. then the rate of interest is
(a) 20% **(b)** 10% **(c)** 5% **(d)** None

11. A sum of money amount to Rs. 6200 is 2 years and Rs. 7400 in 3 years. The principal and rate of interest are
(a) Rs. 3800 31.57%
(b) Rs. 3000, 20%
(c) Rs. 3500, 15%
(d) none of these

12. A sum of Rs. 46,875 was lent out at simple interest and at the end of 1 year 8 months the total amount was Rs. 50,000. Find the rate of interest per cent per annum.
(a) 4% **(b)** 5% **(c)** 7% **(d)** None

13. It the simple interest on Rs. 20,000 increases by Rs. 4,000 with the increase of time by 4 Yrs. Find the rate per cent per annum.
(a) 0.15% **(b)** 0.5% **(c)** 5% **(d)** None

14. If the difference between simple interest on Rs. 4,000 and on Rs. 6,500 for 5 Yrs. Be Rs. 800 at same rate of simple interest per annum. Then the rate of interest is
(a) 5.3% **(b)** 6.2%
(c) 6.4% **(d)** None

Compound Interest-Basic

15. If P = Rs. 1000, R = 5% p.a., n = 4; What is Amount and C.I. is
(a) Rs. 1215.50, Rs. 215.50
(b) Rs. 1125, Rs. 125
(c) Rs. 2115, Rs. 115

16. Rs. 100 will become after 20 years at 5% p.a. compound interest amount
(a) Rs. 250 **(b)** Rs. 205
(c) Rs. 265.50 **(d)** None

17. If A = Rs. 1000, n = 2 years, R = 6% p.a. compound interest payable half-yearly, then principal (P) is
(a) 888.80 **(b)** Rs.885
(c) 800 **(d)** None

18. After Mr. Gupta introduced new norms, turnover of Gupta & sons went up from Rs. 100 million to Rs 300 million in 3 yrs. The compounded growth rate of co. is $(3^{1/2} = 1.4422)$
(a) 11.22% **(b)** 33.22%
(c) 40% **(d)** 44.22%

19. Find the amount of Rs.2000 after 10 years at 8% converted quarterly for the 1st 4 years and 6% converted monthly thereafter.
(a) Rs.4025.50 **(b)** Rs.3931.78
(c) Rs.2600.50 **(d)** None

20. A man invested one4hird of his capital at 7% one fourth at 8% and the remainder at 10%. If the annual income is Rs. 561. The capital is -
(a) Rs. 4,400 (b) Rs. 5,500
(c) Rs. 6,600 (d) Rs. 5,800

Compound Interest-Advance

3. Find the difference between the S.I. and C.I. on Rs.8000 for 3 years at 5% p.a.
(a) Rs.65 (b) Rs.62
(c) Rs.61 (d) None

4. The difference between C.I. and S.I on a certain sum of money invested for 3 years at 6% p.a is Rs. 110.16. The sum is?
(a) Rs. 3000 **(b)** Rs. 3700
(c) Rs. 12000 **(d)** Rs. 10000

5. A sum at C.I. becomes Rs. 1,020 after 3 yrs. & Rs.1,088 after 4 yrs. The rate of interest is
(a) 5.60% **(b)** 6.66%
(c) 7.66% **(d)** 8.66%

6. A sum at C.I. becomes Rs. 6,500 after 6 years &Rs. 7,800 after a further period of 2 more years. The amount due after a further period of 2 more years is –
(a) Rs. 9,360 **(b)** Rs. 6,500
(c) Rs. 9,100 **(d)** Rs. 9,390

7. Sohan deposited Rs.4800 in a bank after 4years it becomes Rs.6000 at a certain rate of compound interest what will be his amount in the bank after 12 years.
(a) Rs.9375 **(b)** Rs.9000
(c) Rs.9525 **(d)** None

8. If the compound Interest on a certain sum of money for 2 years at 4% p.a. be Rs.510, then its simple Interest (S.I.) of same time at same rate of interest is
(a) Rs.500 **(b)** Rs.510
(c) Rs.450 **(d)** None

Effective Rate

1. The effective rate of interest corresponding to a nominal rate 3% p.a. payable half yearly is
(a) 3.2%
(b) 3.25% p.a.
(c) 3.0225% p.a.
(d) None of these

2. The effective rate of interest corresponding a nominal rate of 7% p.a. convertible quarterly is
(a) 7% **(b)** 7.5%
(c) 5% **(d)** 7.18%

Depreciation

21. The useful life of a machine is estimated to be 10 years and cost Rs. 10000. Rate of depreciation is 10% p.a. The scrap value at the end of its life is
(a) Rs. 3486 **(b)** Rs. 4383
(c) Rs. 3400 **(d)** Rs. 10000

22. A machine is depreciated at the rate of 10% on reducing balance. The original cost was Rs. 10,000 and the ultimate scrap value was Rs.3,750. Find the effective life of the machine. (Given: log 2 = 0.30103, log 3= 0.47712).
(a) 5 yrs. **(b)** 5.19 yrs.
(c) 9.3 yrs. **(d)** None of these

Phase-2

Present Value

27. The present value of an annuity of Rs. 3000 for 15 years at 4.5% p.a. CI is
(a) Rs. 23809.41 **(b)** Rs. 32218.63
(c) Rs. 32908.41 **(d)** none of these

28. A loan of Rs. 10.000 is to be paid back in 30 equal instalments. The amount of each installment to cover the principal and at 4% p.a. CI is
(a) Rs. 587.87 **(b)** Rs. 587
(c) Rs. 578.87 **(d)** none

29. Y bought a TV costing Rs. 13,000 by making a down payment of Rs. 3000 and agreeing to make equal annual payment for four years. How much would be each payment if the interest on unpaid amount be 14% compounded annually?
(a) Rs. 3,432.05 **(b)** Rs. 3,932.05
(c) Rs. 15000 **(d)** none

30. Munna purchased LED TV paying Rs.5,000 down and promising to pay Rs.200 every quarter for next 10 years. The seller charges interest at the rate of 12% per annum compounded quarterly. If Munna missed the first 10 payments, what must he pay when the 11th payment is due to discharge his entire loan?
(a) Rs.5873.86 **(b)** Rs.7108.6
(c) Rs.6399.26 **(d)** None

31. Ram purchased a house for which he agreed to pay Rs.5000 at the beginning of each 3 months until he has made 10 payments. If money is worth 6% compounded quarterly, what is the equivalent cash price of the house?
(a) Rs. 46802.58 **(b)** Rs. 47108.60
(c) Rs. 46399.26 **(d)** None

Future Value

23. A person invests Rs. 500 at the end of each year with a bank which pays interest at 10% p. a. C.I. annually. The amount standing to his credit one year after he has made his yearly investment for the 12th time is.
(a) Rs. 11764.50 **(b)** Rs. 10000
(c) Rs. 12000 **(d)** none

24. Rs 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?
(a) Rs. 2044 **(b)** Rs. 5000
(c) Rs. 1200 **(d)** none

25. An annuity consisting of equal payments at the end of each month for 2 years is to be purchased for Rs. 2000. If the interest rate is 6% compounded monthly, how much is each payment?
(a) Rs.73.86 **(b)** Rs.31.60
(c) Rs.78.64 **(d)** None

26. At the Beginning of each Period Consisting of 6-months, Rs 500 is deposited into saving account that pays 5% compounded half-yearly. Find the balance in the account at the end of each year.
(a) Rs.5724 **(b)** Rs.5742
(c) Rs.5472 **(d)** None

Perpetual Annuity

36. Assuming that the discount rate is 7% p.a. how much would pay to. receive Rs. 200 growing at 5% annually for ever?
(a) Rs. 2,500 (b) Rs. 5,000
(c) Rs. 7,500 (d) Rs. 10,000

Present Value of Future Money

Find the present value of Rs. 1,00,000 to be required after 5 years if the interest rate be 9%. Given that $1,09^5$ =1.5386.
(a) 78,995.98
(b) 64,994.15
(c) 88,992.43
(d) 93,902.12

Net Present Value

33. If the cost of capital be 12% per annual, then the net present value (in nearest Rs. in thousand) from the given cash flow is given as:

Years	0	1	2	3
Operating profit	(100)	60	40	50

(a) 31048 (b) 34185
(c) 21048 **(d) 24187**

Capital Investment

35. A machine with useful life of 7 years costs Rs. 10,000 while another machine with useful life of 5 years costs Rs. 8,000. The first machine saves labor expenses of Rs. 1900 annually and the second one saves labor expenses by Rs. 2,200 annually. Determine the preferred course of action. Assume cost of borrowing as 10% per annum.
(a) First machine
(b) Second machine
(c) Any of two machines
(d) Both the machine.

Leasing Concept

32. ABC Ltd. wants to lease out an asset costing Rs. 3,60,000 for a five-year period. It has fixed a rental of Rs. 1,05,000 per annum payable annually starting from the end of first year. Suppose rate of interest is 14% per annum compounded annually on which money can be invested by the company. Is this agreement favorable to the company?
(a) Leasing is preferable
(b) Leasing is not preferable
(c) Can't say.

Valuation of Bond

34. What will be the price of a bond with a face value of Rs.1000 carrying a coupon of 10% maturing in 3 Years at 10% premium on par value?

(a) Rs.826.43 (b) Rs.7835.26
(c) Rs.1075.12 (d) Rs.1000

CAGR Model

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

Years	1	2	3	4	5	6
OP	90	100	106.4	107.14	120.24	157.34

Then the operating profit (OP) of Compound Annual Growth Rate (CAGR) for year 6 with respect to year 2 is given that:
(a) 9% (b) 12%
(c) 11% (d) 13%

Previous Year Questions

Level-1

Dec-2009

The compound interest for a certain sum @ 5% p.a. for first year is Rs. 25. The S-! for the same money @ 5% p.a. for 2 years will be.
(a) Rs. 40 (b) Rs. 50
(c) Rs. 60 (d) Rs. 70.

June-2010

if the simple Interest on a sum of money at 12% p.a. for two years is Rs. 3,600. The compound interest on the same sum for two years at the same rate is :
(a) Rs. 3,816 (b) Rs. 3,806
(c) Rs. 3,861 (d) Rs. 3,860

Dec-2010

Mr. X invests 'P' amount at Simple Interest rate 10% and Mr. Y invests 'Q' amount at Compound Interest rate 5% compounded annually. At the end of two years both get the same amount of interest, then the relation between two amounts P and Q is given by :
(a) $P = \frac{41Q}{80}$ (b) $P = \frac{41Q}{40}$
(c) $P = \frac{41Q}{100}$ (d) $P = \frac{41Q}{200}$

June-2011

If a simple interest on a sum of money at 6% p.a. for 7 years is equal to twice of simple interest on another sum for 9 years at 5% p.a. The ratio will be:
(a) 2:15 (b) 7: 15
(c) 15:7 (d) 1:7

Level-2

June-2011

By mistake a clerk, calculated the simple interest on principal for 5 months at 6.5% p.a. instead of 6 months at 5.5% p.a. If the error in calculation was Rs. 25.40. The original sum of principal was _____.
(a) Rs. 60,690 (b) Rs. 60,960
(c) Rs. 90,660 (d) Rs. 90,690

June-2014

The partners A and B together lent Rs. 3,903 at 4% per annum interest compounded annually. After a span of 7 years, A gets the same amount as B gets after 9 years. The share of A in the sum of Rs. 3,903 would have been:
(a) Rs. 1,875 (b) Rs. 2,280
(c) Rs. 2,028 (d) Rs. 2,820

Dec-2014

A certain sum of money was invested at simple rate of interest for three years, if the same has been invested at a rate that was seven percent higher, the interest amount would have been Rs. 382 more. The amount of sum invested is:
(a) Rs. 12,600 (b) Rs. 6,800
(c) Rs. 4,200 (d) Rs. 2,800

June-2015

A sum of money doubles itself in 8 years at simple interest. The number of years it would triple itself is _____.
(a) 20 years (b) 12 years
(c) 16 years (d) None of these

Level-3

June-2016

Mr. X bought an electronic item for Rs. 1,000. What would be the future value of the same item after 2 years, if the value is compounded semi. annually at 22% per annum?
(a) Rs. 1,488.40 (b) Rs. 1,518.07
(c) Rs. 2,008.07 (d) Rs. 2,200.00

June-2016

If an amount is kept at simple interest, it earns an interest of Rs. 600 in first two years but when kept at compound interest it earns an interest of Rs. 660 for the same period, then the rate of interest and principal amount respectively are:
(a) 20%, Rs. 1,200 (b) 10%, Rs. 1,200
(c) 20%, Rs. 1,500 (d) 10%, Rs. 1,500

May-2018

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) Rs. 112.50 (b) Rs. 225
(c) Rs. 125 (d)Rs. 107.50

Nov-2018

A certain sum of money Q was deposited for 5 year and 4 months at 4.5% simple interest and amounted to Rs. 248, then the value of Q is
(a) Rs. 200 (b) Rs. 210
(c) Rs. 220 (d) Rs. 240

Summary Notes

Permutation & Combination

Problems Based on Word

1. How many different words can be formed with letters of the word HARYANA?
(a) 240 **(b)** 360
(c) 840 **(d)** 640

2. The number of ways in which the letters of the word 'MOBILE' be
(a) arranged Ans :720
(b) re-arranged Ans :719
(c) vowels come together Ans :144
(d)vowels never come together Ans :1576

3. The number of ways the letters of the word "TRIANGLE" to be arranged so that the word "ANGLE" will be always present
(a) 20 **(b)** 60
(c) 24 **(d)** 32

4. The number of different words that can be formed with 12 consonants and 5 vowels by taking 4 consonants and 3 vowels in each word is
(a) $12_{C_4} \times 5_{C_3}$ **(b)** 17_{C_7}
(c) 4950 x 7! **(d)** none of these

5. The ways of selecting 4 letters from the word 'EXAMINATION' is
(a) 136 **(b)** 130
(c) 125 **(d)** none of these

6. The number of arrangements in which the letters of the word 'MONDAY' be arranged so that the words thus formed begin with M and do not end with N is
(a) 720 **(b)** 120
(c) 96 **(d)** none of these

7. The number of words that can be made by rearranging the letters of the word APURNA so that vowels and consonants appear alternate is
(a) 18 **(b)** 35
(c) 36 **(d)** none of these

Problems Based on Number

13. How many four-digit number can be formed by using the digit 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 with no digit repeated?
(a) 4536 **(b)** 3604
(c) 3354 **(d)** 5554

14. The number of 4-digit numbers greater than 5,000 can be formed out of the digits 3,4,5,6 and 7 (No Digit is repeated) the number of such is
(a) 72 **(b)** 27
(c) 70 **(d)**none

15. The number of numbers lying between 100 and 1000 can be formed with the digits 1,2,3,4, 5,6,7 is
(a) 210 **(b)** 200
(c) 110 **(d)**none

16. The number of even numbers greater than 300 can be formed with the digits 1,2,3,4,5 without repletion is
(a) 110 **(b)** 112
(c) 111 **(d)**none

17. The sum of all 4-digit number containing the digits 2, 4, 6, 8 without repetitions is
(a) 1, 33,330 **(b)** 1,22,220
(c) 2, 13,330 **(d)**none

Problems Based on Geometry

8. The number of straight lines obtained by Joining 16 points on a plane, on twice of them being on the same line is
(a) 120 **(b)** 110
(c) 210 **(d)** none of these

9. 8 Points are marked on the circumference of a circle. The number of chords obtained by joining these in pairs is
(a)25 **(b)** 27
(c) 28 **(d)** none of these

10. There are 12 points in a plane of which 5 are collinear. The number of triangles in
(a) 200 **(b)** 211
(c) 210 **(d)** none of these

11. The number of diagonals in a decagon is
(a) 30 **(b)** 35
(c) 45 **(d)** none of these

12. The number of parallelograms that can be formed from a set of four parallel lines intersecting another set of three parallel lines is
(a) 6 **(b)** 18
(c) 12 **(d)** 9

Problems Based on Theorem

1. A person has 8 friends. The number of ways in which he may invite one or more of them to a dinner is.
(a) 250 **(b)** 255
(c) 200 **(d)** none of these

2. The number of ways in which the letters of 10 different things taken 4 at a time in which one particular thing always occurs is
(a) 2015 **(b)** 2016
(c) 2014 **(d)** none of these

3. The number of arrangements of 10 things taken 4 at a time in which one particular thing never occurs is
(a) 3,020 **(b)** 3,025
(c) 3,024 **(d)** none of these

4. The number of ways in which a person can chose one or more of the four electrical appliances: T.V. Refrigerator. Washing Machine and a cooler is?
(a) 15 **(b)** 25
(c) 24 **(d)** none of these

5. The number of ways in which 12 students can be equally divided into three groups is
(a) 5775 **(b)** 7575
(c) 7755 **(d)** none of these

6. The number of ways in which 15 mangoes can be equally divided among 3 students is
(a) $15!/5!^4$ **(b)** $15!/5!^3$
(c) $15!/5!^2$ **(d)** none of these

Circular Permutation

June-2011

If 15 persons are to be seated around 2 round tables, one occupying 8 persons and another 7 persons. Find the number of ways in which they can be seated.
(a) $\frac{15!}{18!}$ (b) $^{15}C_7 \frac{7!}{8!}$
(c) 7!.8! **(d) $2.^{15}C_7$ 6! 7!**

Alternate | Non-Alternate

June-2011

A garden is having 6 tall trees in a row. In how many ways can 5 children stand, one in a gap between the trees in order to pose for a photograph?
(a) 24 **(b) 120**
(c) 720 (d) 30

Previous Year Questions

Level-1

June-2009

Number of ways of painting a face of a cube by 6 colours is_____
(a) 36 **(b) 6**
(c) 24 (d) 1

Dec-2009

Out of 4 gents and 6 ladies, a committee is to be formed. Find the number of ways the committee can be formed such that it comprises of at least 2 gents and the number of ladies should at least be double of gents.
(a) 94 (b) 132
(c) 136 (d) 104

June-2010

Six points are on a circle. The number of quadrilaterals that can be formed are:
(a) 30 (b) 360
(c) 15 (d) None of the above

June-2012

There are 12 questions to be answered in Yes or No. How many ways can these be Answered?
(a) 1024 (b) 2048
(c) 4096 (d) None

Dec-2012

A man has 3 sons and 6 schools within his reach. In how many ways, he can send them to school, if no two of his sons are to read in the same school?
(a) $^{6}P_{2}$ **(b) $^{6}P_{3}$**
(c) 6^{3} (d) 3^{6}

Level-2

June-2013

Number of ways of shaking hands in a group of 10 persons shaking hands to each other are:
(a) 45 (b) 54
(c) 90 (d) 10

Dec-2013

In how many ways can a family consist of three children having different birthdays in a leap year
(a) $^{365}C_{3}$ (b) $^{366}C_{3} - 3$
(c) 366 × 365 × 364 (d) $^{366}C_{3}$

June-2015

A person has ten friends of whom six are relatives. If he invites five guests such that three of them are his relatives, then the total number of ways in which he can invite them are:
(a) 30 (b) 60
(c) 120 (d) 75

Dec-2015

An examination paper with 10 questions consists6 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) 1005 (d) 1022

June-2016

In how many ways can a selection of 6 out of 4 teachers and 8 students be done so as to include at least two teachers?
(a) 220 **(b) 672**
(c) 596 (d) 968

Level-3

June-2016

There are 10 students in a class including 3 girls. The number of ways to arrange them in a row when any two girls out of three never comes together:
(a) $^{8}P_{3} \lfloor 7$ (b) $^{3}P_{3} \lfloor 7$ (c) $^{8}P_{3} \lfloor 10$ (d) None

June-2016

The maximum number of points of inter section of 10 circles will be:
(a) 2 (b) 20 **(c) 90** (d) 180

Nov-2018

A bag contains 4 red, 3 black and 2 white balls. In how many ways 3 balls can be drawn from this bag so that they include at least one black bail?
(a) 64 (b) 46 (c) 85 (d) None

June-2019

Which of the following is a correct statement.
(a) $^{n}P_{n} = {}^{n}P_{n-1}$ (b) $^{n}p_{n} = {}^{2n}p_{n-2}$
(c) $^{n}P_{n} = {}^{3n}P_{n-3}$ (d) $^{n}P_{n} = {}^{n(n-1)}P_{n-1}$

July-2021

The number of ways 5 boys and 5 girls can be seated at a round table, so no two boys are adjacent is:
(a) 2,550 (b) 2,880 (c) 625 (d) 2,476

Dec-2022

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

Sequence & Series

Arithmetic Progression

1. Which term of the progression -1, -3, -5, ... Is-39
(a) 21st **(b)** 20th
(c) 19th **(d)** none of these

2. The value of x such that 8x + 4, 6x – 2, 2x + 7 will form an AP is
(a) 15 **(b)** 2
(c) 15/2 **(d)** none of these

3. The number of numbers between 74 and 25556 divisible by 5 is
(a) 5090 **(b)** 5097
(c) 5095 **(d)** none of these

4. The sum of all positive integral multiples of 3 less than 100 is
(a) 1584 **(b)** 1665
(c) 1683 **(d)** None of these

5. In an A.P. 3rd term is 18 & 7th term is 30, the sum of its 17 terms is
(a) 600 **(b)** 612
(c) 624 **(d)** None of these

6. If the 9th term of an A.P. is zero, $\frac{t_{29}}{t_{19}}$ is
(a) 1 **(b)** 2
(c) 3 **(d)** 4

7. The 4 arithmetic means between -2 & 23 are
(a) 3, 13, 8, 18 **(b)** 18, 3, 8, 13
(c) 3, 8, 13, 18 **(d)** none of these

8. The first and the last term of an AP are -4 and 146. The sum of the terms is 7171. The number of terms is
(a) 101 **(b)** 100
(c) 99 **(d)** none of these

Geometric Progression

9. The 7th term of the series 6, 12, 24, ...is
(a) 384 **(b)** 834
(c) 438 **(d)** none of these

10. t_8 of the series 6, 12, 24...is
(a) 786 **(b)** 768
(c) 867 **(d)** none of these

11. The 4th term of the series 0.04, 0.2, 1.....is
(a) 0.5 **(b)** ½
(c) 5 **(d)** none of these

12. If you save 1 paise today, 2 paise the next day 4 paise the succeeding day and soon, then your total savings in two weeks will be
(a) Rs. 163 **(b)** Rs. 183
(c) Rs. 163.83 **(d)** none of these

13. The sum of the infinite GP 14, - 2, + 2/7, - 2/49, + ... is
(a) $4\frac{1}{12}$ **(b)** $12\frac{1}{4}$
(c) 12 **(d)** none of these

14. Four geometric means between 4 and 972 are
(a) 12 ,36 ,108 ,324
(b) 12, 24, 108, 320
(c) 10, 36, 108, 320
(d) none of these

Relation Between AM GM & HM

26. If AM and HM of two numbers are 32 and 2 respectively then G.M. is
(a) 8 (b) $4\sqrt{2}$
(c) 64 (d) None

Actual Que on Seq & Series

Seq is Given & Formula is asked

15. The nth element of the sequence 1, 3, 5, 7, ...Is
(a) n **(b)** 2n – 1
(c) 2n + 1 **(d)** none of these

16. The sum of n terms of the series 2.4.6 + 4.6.8 + 6.8.10 + ...is
(a) $2n(n^3+6n^2+11n+6)$
(b) $2n(n^3-6n^2+11n-6)$
(c) $n(n^3+6n^2+11n+6)$
(d) $n(n^3+6n^2+11n-6)$

Formula is Given Seq is Asked

17. The first three terms of sequence when nth term t, is $n^2 - 2n$ are
(a) -1, 0, 3
(b) 1, 0, 2
(c) -1, 0, -3
(d) none of these

18. The nth term of the series whose sum to n terms is $5n^2 + 2n$ is
(a) 3n - 10
(b) 10n – 2
(c) 10n - 3
(d) none of these

General Approach to Solve Advance Que

25. The mth term of an A.P. is n and nth term is m. The r the term of it is
(a) m + n + r **(b)** n + m – 2r
(c) m + n + r/2 **(d)** none

Problems Based on Theorem

Assuming Value Problem

19. If p, q and r are in A. P. and x, y, z are in G.P. then $x^{q-r}, y^{r-p}, z^{p-q}$ is equal to
(a) 0 **(b)** -1
(c) 1 **(d)** none of these

20. If x, y, z are in G.P., then
(a) $y^2 = xz$
(b) $y(z^2 + x^2) = x(z^2 + y^2)$
(c) $2y = x + z$
(d) none of these

21. If x, y, z are the terms in G.P. then the terms $x^2 + y^2$, xy + yz, $y^2 + z^2$ are in:
(a) A.P. (b) G.P.
(c) H.P. (d) None

22. If $\frac{1}{x+y}, \frac{1}{2y}, \frac{1}{y+z}$ are in A.P., then x, y,z are in
(a) G.P. **(b)** A.P.
(c) Both (a)&(b) **(d)** None

Assuming Value Problem

23. If 1 + a + a^2 + ... ∞ = x and
1 + b + b^2 + ...∞ = y then
1 + ab + a^2b^2 + ... ∞ = x is given by _
(a) (xy)/ (x + y-1) **(b)** (xy)/(x-y-1)
(c) (xy)/(x+y+1) **(d)** none

24. The sum of n terms of two A.P are in the ratio of (7n – 5)/(5n + 17). Then the _____ term of the two series are equal.
(a) 12 **(b)** 6
(c) 3 **(d)** none

Previous Year Questions

Level-1

June-2009

If in an A.P., Tn represents nth term.
If t_7: t_{10} = 5:7 then t_8: t_{11} = _____
(a) 13: 16 **(b) 17: 23** (c) 14: 17 (d) 15: 19

June-2010

Divide 144 into three parts which are in AP and such that the largest is twice the smallest, the smallest of three numbers will be :
(a) 48 (b) 36 (c) 13 **(d) 32**

Dec-2010

If G be Geometric Mean between two numbers a and b, then the value of $\frac{1}{G^2-a^2}+\frac{1}{G^2-b^2}$ is equal to
(a) G^2 (b) 3 G^2 **(c) 1/G^2** (d) 2/G^2

June-2011

If Sum (S_n) of 'n'- terms of an Arithmetic Progression is ($2n^2$ + n). What is the difference of its 10^{th} and 1^{st} term ?
(a) 207 **(b) 36** (c) 90 (d) 63

June-2011

If Sum (S_n) of 'n' Find the product of;
(243), $(243)^{1/6}$, $(243)^{1/36}$…….
(a) 1,024 (b) 27 **(c) 729** (d) 246

June-2011

Geometric Mean of P, P^2, P^3 ……., P^n will be:
(a) P^{n+1} **(b)** $P^{\frac{1+n}{2}}$
(c) $P^{\frac{n(n+1)}{2}}$ (d) None

Level-2

Dec-2011

The sum of all two Digit odd numbers is
(a) 2475 (b) 2575 (c) 4950 (d) 5049

Dec-2011

If 5^{th} term of a G.P. is $\sqrt[3]{3}$, then the product of first nine terms is
(a) 8 **(b) 27** (c) 243 (d) 9

June-2012

If arithmetic mean between roots of a quadratic equation is 8 and the geometric mean between them is 5, the equation is _____.
(a) x^2 - 16x - 25 = 0 **(b) x^2 - 16x + 25 = 0**
(c) x^2 - 16x + 5 = 0 (d) None

Dec-2013

If Geometric mean (G.M.) of a, b, c, d is 3, then G.M. of $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}, \frac{1}{d}$ will be:
(a) 1/3 (b) 3 (c) 81 (d) 1/81

Dec-2014

If $S_n = n^2p$ and $S_m = m^2p$ ($m \neq n$) is the sum of an A.P. then S_p = _____
(a) p^2 **(b) p^3** (c) $2p^3$ (d) p^4

June-2015

if S be the sum, P the product and R is the sum of reciprocals of n- terms in G.P then P^2R^n = _
(a) S^{2n} **(b) S^n** (c) S^{2n} (d) S^{-n}

Level-3

June-2016

The sum of n terms of the series
log x + log $\frac{x^2}{y}$ + log $\frac{x^3}{y^2}$ +……..is
(a) $\frac{n}{2}\left[2n\log\left(\frac{x}{y}\right)+\log xy\right]$ (b) $\frac{n}{2}\left[n\log xy+\log\left(\frac{x}{y}\right)\right]$
(c) $\frac{n}{2}\left[n\log\left(\frac{x}{y}\right)-\log xy\right]$ **(d) $\frac{n}{2}\left[n\log\left(\frac{x}{y}\right)+\log xy\right]$**

June-2016

A G. P. (Geometric Progression) consists of 2n terms. If the sum of the terms occupying the odd places is S_T and that of terms in the even places is S_2, the common ratio of the progression is:
(a) n (b) $2S_1$ **(c) $\frac{S_2}{S_1}$** (d) $\frac{S_1}{S_2}$

June-2019

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:
(a) AP (b) GP **(c) HP** (d) None

Dec-2021

The largest value of n for which $\frac{1}{2}+\frac{1}{2^2}+\ldots\ldots\frac{1}{2^n}<0.998$ is.
(a) 9 (b) 6
(c) 7 **(d) 8**

June-2022

The n^{th} term of series 9,7,5….and 15,12,9,… are same. Find the n^{th} term?
(a) 7 (b) 8
(c) 9 (d)10

Relation & Function

Set

1. {(x, y), Y = x^2} is
(a) Not a function
(b) **(c)** inverse mapping
(c) A function
(d) **(d)** none of these

2. {(x, y) x = 4} is a
(a) Not a function
(b) **(c)** one – one mapping
(c) Function
(d) none of these

3. If A = {1, 2, 3} and B = {4, 6, 7} then the relation R = {(2, 4) (3, 6)} is
(a) A function from A to B
(b) A function from B to A
(c) both **(a)** and **(b)**
(d) **(d)** not a function

4. {(x, y)Ix<y} is a
(a) Not a function
(b) **(c)** one-one mapping
(c) A function
(d) **(d)** none of these

5. If A = {1, 2, 3, 4,}
B = {2, 4, 6, 8,}
f (1) = 2, f (2) = 4, f (3) = 6 and
f (4) = 8, And f: A → B then f^{-1} is :
(a) {(2,1), (4, 2), (6,3), (8,4)}
(b) {(1,2), (2,4), (3,6), (4,8)}
(c) {(1,4), (2, 2), (3, 6), (4, 8)}
(d) None of these

Domain & Range

6. {(x, y), Y = x^2} is
(a) Not a function
(c) inverse mapping
(b) A function
(d) none of these

7. {(x, y) x = 4} is a
(a) Not a function
(c) one – one mapping
(b) Function
(d) none of these

8. If A = {1, 2, 3} and B = {4, 6, 7} then the relation R = {(2, 4) (3, 6)} is
(a)A function from A to B
(b) A function from B to A
(c)both **(a)** and **(b)**
(d) not a function

9. Let A = {2, 3, 5, 7} and B = {0, 1, 3, 5, 7}. If f is a mapping from A to B such that **f(x) = x – 2** then f is
(a) An into function
(b) constant function
(c) An onto function
(d)identical function

10. If f (x + 1) = 2x + 7 then f (0) is equal to
(a) 5 **(b)** 3
(c) 4 **(d)** 0

11. If f(x) = x^2 + 3, g(x) = (x) then fog (x) is –
(a) x^2 +3 **(c)** $(x + 3)^2$
(b) $(x)^2 + (x^2 + 3)$ **(d)** $(x)^2 (x^2 + 3)$

Types of Function

1. If f(x) = x^2, x >0, then the function is
(a) Not one to one function
(b) into function
(c) One to one function
(d) none of these

2. N is the set of all-natural numbers and E is the set of all even numbers. If f: N E defined by f(x) = 2x, for all x ε N is:
(a) One – one and onto
(c) Many one onto
(c) one – one into
(d) can't say

3. The function f(x) = 2^x is
(a) One One **(b)** many one
(c) One many **(d)** none of these

4. {(x, y) I x + y = 5} is
(a) Not a function
(b) one – one mapping
(c)A composite function
(d) none of these

5. Let f: Z → Z f (x) = $x^2 + x\ for\ all\ x \in z$, then f is:
(a) Many-one **(b)** One-One
(c) Onto **(d)** None

6. The inverse h^{-1} (x) when h(x) = $\log_{10}$x is
(a) Log_{10}x **(c)** $\log_{10}(1/x)$
(b) 10^x **(d)** none of these

7. If f(x) = 1/1-x, then f^{-1} (x) is
(a) 1-x **(c)** x/x-1
(b) (x-1)/x **(d)** none of these

Problems Based on Theorem

8. "is equal to" over the set of all rational numbers is
(a) Transitive **(c)** reflexive
(b) Symmetric **(d)** equivalence

9. is perpendicular to" over the set of straight lines in a given plane is
(a) Symmetric **(c)** transitive
(b) Reflexive **(d)** equivalence

10. "is the squares of" over n set of real numbers is
(a) Reflexive **(c)** transitive
(b) Symmetric **(d)** none of these

11. If A = {1, 2, 3}
then R = {(1, 1), (2, 2), (3, 3), (1, 2)} is
(a) Reflexive and transitive but not symmetric
(b) Reflexive and symmetric but nor transitive
(c) Symmetric and transitive but not reflexive
(d) Identity relation

12. "Is greater than" over the set of all-natural number if known as
(a) Transitive
(b) reflexive
(c) Symmetric
(d) equivalence

Previous Year Questions

Level-1

June-2011

There are 40 students, 30 of them passed in English, 25 of them passed in Maths and 15 of them passed in both. Assuming that every Student has passed at least in one subject. How many student's passed in English only but not in Maths.
(a) 15 (b) 20
(c) 10 (d) 25

June-2011

If A = {± 2, ± 3}, B = {1,4,9} and
F = {(2, 4), (- 2, 4), (3, 9), (- 3, 4)} then 'F' is defined as
(a) One to one function from A into B.
(b) One to one function from A onto B.
(c) Many to one function from A onto B.
(d) Many to one function from A into B

June-2011

If $f(x) = \frac{x}{\sqrt{1+x^2}}$ and $g(x) = \frac{x}{\sqrt{1-x^2}}$ Find fog?
(a) x (b) $\frac{1}{x}$
(c) $\frac{x}{\sqrt{1-x^2}}$ (d) $x\sqrt{1-x^2}$

June-2012

The range of the function f: N → N; $f(x) = (-1)^{x-1}$, is
(a) {0,-1} **(b) {1,-1}**
(c) {1,0} (d) (d) {1,0,-1}

June-2012

The minimum value of the function $x^2 - 6x + 10$ is __
(a) 1 (b) 2
(c) 3 (d) 10

Level-2

June-2016

The domain (D) and range (R) of the function
f(x) = 2 - | x+1 | is
(a) D = Real numbers, R = (2, ∞)
(b) D = Integers, R = (0, 2)
(c) D = Integers, R = (- ∞, ∞)
(d) D = Real numbers, R = (- ∞, 2)

Dec-2016

The number of subsets of the set formed by the word Allahabad is:
(a) 128 (b) 16 **(c) 32** (d) 64

June-2017

The range of function f defined by $f(x) = \frac{x}{x^2+1}$ is:
(a) $\{x: \frac{-1}{2} < x < \frac{1}{1}\}$ (b) $\{x: \frac{-1}{2} \le x < \frac{1}{2}\}$
(c) $\{x: \frac{-1}{2} \le x \le \frac{1}{2}\}$ (d) $\{x: x > \frac{1}{2}$ or $x < \frac{-1}{2}\}$

Dec-2017

If $f(x) = \frac{x+1}{x+2}$, then $f\left\{f\left(\frac{1}{x}\right)\right\}$ = _____.
(a) $\frac{2x+3}{3x+5}$ (b) $\frac{2x+5}{3x+2}$
(c) $\frac{3x+2}{5x+3}$ (d) $\frac{5x+2}{2x+3}$

May-2018

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 : x ∈ N is =
(a) One-one-into (b) Many-one-into
(c) One-one onto (d) Many-one-onto

Level-3

Nov-2018

A is {1,2,3,4} and B is {1,4,9,16,25} if a function f is defined from set A to B where $f(x) = x^2$ then the range of f is:
(a) {1,2,3,4} **(b) {1,4,9,16}**
(c) {1,4,9,16,25} (d) None

June-2019

A = {1 2 34 10} a relation on A, R = {(x, y)/x + y = 10, x ∈ A, Y ∈ A, x ≥ 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

Jan-2021

Let F: R R be defined by
$$f(x) = \begin{cases} 2x \text{ for } x > 3 \\ x^2 \text{ for } 1 < x \le 3 \\ 3x \text{ for } x \le 1 \end{cases}$$
The value of f(-1) + f(2) + f(4) is
(a) 9 (b) 14 (c) 5 (d) 6

July-2021

The range of the function f defined by **$f(x) = \sqrt{16 - x^2}$** is
(a) [-4, 0] **(b) [-4, 4]**
(c) [0, 4] (d) [+4, 4]

July-2021

If $f(x) = x^2 - 1$ and g(x) = |2x + 3|, then
fog (3) - gof (-3) = ?
(a) 71 **(b) 61**
(c) 41 (d) 51

Derivation

Basics & Chain Rule

1. If y= 2x+x^2 then dy/dx is:
(a) 2(x+1) **(b)** 2(x-1)
(c) x+1 **(d)** x-1

2. The gradient of the curve y= $2x^3 - 5x^2 - 3x$ *at* $= 0$ *is*:
(a) 3 **(b)** -3
(c) 1/3 **(d)** none

3. if y= x (x-1) (x-2) then $\frac{dy}{dy}$is:
(a) $3x^2 - 6x + 2$ **(b)** $-6x + 2$
(c) $3x^2 + 2$ **(d)** none

4. If (x) = e^{ax^2+bx+c}, *the* $f'(x)$*is*:
(a) e^{ax^2+bx+c}
(b) e^{ax^2+bx+c} (2ax+b)
(c) 2ax+b
(d) none

5. If $y = 2^{log_2 x}$, then $dy/dx$is:
(a) $1/x$ **(b)** $2/x$
(c) 1 **(d)** none

6. The derivative of y =$\sqrt{x+1}$is:
(a) $1/\sqrt{x+1}$ **(b)** $-1/\sqrt{x+1}$
(c) $(1/2)\sqrt{x+1}$ **(d)** None

7. 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?
(a) -1 (b) 0
(c) 1 (d) 2

Multiplication & Division Rule

8. If y= $5xy, then\ dx/dy\ is$:
(a) $\frac{5y}{1-5x}$ **(b)** $\frac{4y}{1+x}$
(c) $\frac{x}{1+5y}$ **(d)** none

9. The derivative of x^2log x is:
(a) 1+2log x **(b)** x
(1+2logx) **(c)** 2logx **(d)** None

10. If f (x)= $\frac{x^2+1}{x^2-1}$then f' (x) is:
(a) -4x/ $(x^2-1)^2$ **(b)** 4x $(x^2-1)^2$
(c) x$(x^2-1)^2$ **(d)**None

11. If f (x) =$\frac{x^2}{e^x}$ then f (- 1) is equal to
(a)-1/e **(b)**1/e
(c) -3e **(d)** none

Parametric Equation

12. If x= $3t^2 - 1$, $y = t^3 - t\ them$ $\frac{dy}{dx}$is equal to
(a) $\frac{3t^2-1}{6t}$ **(b)** $3t^2$-1
(c) $\frac{3t-1}{6t}$ **(d)** none

13. Given x= t+ t^{-1} *and* y = t − t^{-1} then the value of $\frac{dy}{dx}$ at t = 2 is:
(a) 3/5 **(b)** -3/5
(c) 5/3 **(d)** none

14. If x = log t, y = e^t, then $\frac{dy}{dx}$ =
(a)1/t **(b)**$t.e^t$
(c) -1/t2 **(d)** none

Let's Deal with $\sqrt{f(x)}$ & $\frac{1}{\sqrt{f(x)}}$

24. If y= $e^{\sqrt{2x}}$then $\frac{dy}{dx}$ is equal to
(a) $\frac{e^{\sqrt{2x}}}{\sqrt{2x}}$ **(b)**$e^{\sqrt{2x}}$
(c)$\frac{e^{\sqrt{2x}}}{\sqrt{2x}}$ **(d)** none

25. if y=$\frac{1}{\sqrt{x}}$ *then* $\frac{dy}{dy}$is equal to:
(a)$\frac{1}{2x\sqrt{x}}$ **(b)**$\frac{-1}{x\sqrt{x}}$
(c)$\frac{-1}{2x\sqrt{x}}$ **(d)** none

Geometry Based

15. The slope of the tangent to the curve y=x^2- x at the point where the line y=2 cuts the curve in the lst quadrant is:
(a) 2 **(b)** 3
(c) -3 **(d)** none

16. The slope of the tangent at the point (2, 2) to the curve x^2+xy+ y^2-4=0 is given by:
(a) 0 **(b)** 1
(c) -1 **(d)** none

17. The slope of the tangent to the curve y= $\sqrt{4-x^2}$ at the point where the ordinate and the abscissa are equal is:
(a) -1 **(b)** 1
(c) 0 **(d)** None

Log & Implicit Function

18. If y = $\sqrt{x^2+m^2}$ then y y_1(where y_1 = dy/dx) is equal to
(a) -x **(b)** x
(c) 1/x **(d)** None

19. If y= $\sqrt{x}^{\sqrt{x}\ldots\infty}$ then $\frac{dy}{dx}$ is equal to
(a)$\frac{y^2}{2-ylog\ x}$ **(b)**$\frac{y^2}{x(2-ylog\ x)}$
(c)$\frac{y^2}{log\ x}$ **(d)** none

20. Given $e^{-xy} - 4xy$=0 then $dyldx$ can be proved to be equal to
(a) -y/x **(b)** y/x
(c) x/y **(d)**none

Application of Derivation

22. A company charges Rs. 550 for a transistor set on orders of 50 or less sets. The charge is reduced by Rs. 5 per set for each set ordered in excess of 50. Find the largest size order company should allow so as to receive maximum revenue.
(a) 60 **(c)** 80
(b) 70 **(d)** none

23. A manufacture can sell x items per day at a price p rupee each, where p = 125 -(5/3)x. The cost of production for x items is 500 + 13x + 0.2x². Find how much he should produce to have a maximum profit assuming that all items produced can be sold. What's the maximum profit.
(a) 30 units, Rs.1180
(b) 40 units, Rs.1280
(c) 60 units, Rs.1300
(d) none of these

Higher Order Derivation

26. For the functions y = x³ – 3x, the value of $\frac{d^2y}{dx^2}$ at which $\frac{dy}{dx}$ is zero, is
(a)± 1 **(b)** ± 6
(c)± 3 **(d)** none

27. If y = $ae^{nx} + be^{-nx}$, then $\frac{d^2y}{dx^2}$ is equal to _____.
(a) n^2y **(b)** ny
(c) $-n^2y$ **(d)** none

Previous Year Questions

Level-1

Dec-2009

Find the second derivative of $y = \sqrt{x + 1}$

(a) ½ $(x + 1)^{-½}$ **(b) -1/4 $(x + 1)^{3/2}$**

(c) 1/4 $(x + 1)^{-½}$ (d) None

June-2010

If $x^2 + y^2 = 4$ then

(a) $y\frac{d^2y}{dx^2} - \left(2\frac{dy}{dx}\right)^2 + 1 = 0$ **(b)** $\mathbf{y\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^2 + 1 = 0}$

(c) $y\frac{d^2y}{dx^2} - \left(\frac{dy}{dx}\right)^2 - 1 = 0$ (d) $y\frac{d^2y}{dx^2} + 2\left(\frac{dy}{dx}\right)^2 + 1 = 0$

June-2011

If $f(x) = {}^xC_3$; then $f'(1) = ?$

(a) $\frac{1}{6}$ **(b)** $\mathbf{\frac{-1}{6}}$

(c) $\frac{5}{6}$ (d) $\frac{-5}{6}$

June-2012

If $-x = c\,t$, $y = c/t$, then $\frac{dy}{dx}$ is equal to:

(a) 1/t (b) $t.e^t$

(c) $-1/t^2$ (d) None

June-2012

If $y = e^{a\log x} + e^{x\log a}$, then $\frac{dy}{dx}$ =

(a) $x^a + a^x$ **(b) $a\,x^{a-1} + a^x \log a$**

(c) $a\,x^{a-1} + x\,a^{x-1}$ (d) $x^x + a^a$

June-2013

If $y = \log_y x$, then $\frac{dy}{dx}$ is equal to:

(a) $\frac{1}{x + \log y}$ **(b)** $\mathbf{\frac{1}{x+x\log y}}$ (c) $\frac{1}{1 + x\log y}$ (d) $\frac{1}{y + \log x}$

Level-2

Dec-2014

If $y = 1 + \frac{x}{\lfloor 1} + \frac{x^2}{\lfloor 2} + \ldots\ldots\ldots\ldots + \frac{x^n}{\lfloor n} + \ldots\ldots$, then the value of $\frac{dy}{dx} - y$ = _____

(a) 1 **(b) 0** (c) 2 (d) - 1

June-2016

If $y = \sqrt{\frac{1-x}{1+x}}$, then $\frac{dy}{dx}$ is equal to -

(a) $\mathbf{\frac{y}{X^2-1}}$ (b) $\frac{y}{1-X^2}$

(c) $\frac{y}{1+X^2}$ (d) $\frac{y}{y^2-1}$

Dec-2016

Differential Co-efficient of $\log_e\left(\sqrt{x-1} + \sqrt{x+1}\right)$ with respect to x is:

(a) $\mathbf{\frac{1}{2\sqrt{x^2-1}}}$ (b) $\frac{1}{2\sqrt{x^2+1}}$

(c) $\frac{1}{2(x^2-1)}$ (d) $\frac{1}{\sqrt{x-1}+\sqrt{x+1}}$

Dec-2016

If $f(x) = \log_e\left(\frac{x-1}{x+1}\right)$, then the value of x at which $f'(x) = 1$, is

(a) 0 (b) 1

(c) $\pm\sqrt{3}$ (d) $\pm\sqrt{2}$

Dec-2017 **Easy but Manipulation in Option**

If $y = \log x^x$ then $\frac{dy}{dx}$ is equal to:

(a) log ex (b) $\log\frac{e}{x}$

(c) $\log\frac{x}{e}$ (d) 1

Level-3

Dec-2014

$\frac{d}{dx}$ (x. logx)

(a) x (1 + logx) **(b) 1 + logx**

(c) e^xx.logx (d) x^2 (logx)

Nov-2019

$\frac{d}{dx}$ (x. logx)

(a) x (1 + logx) **(b) 1 + logx**

(c) e^xx.logx (d) x^2 (logx)

Nov-2020

The average cost function of a good is $2Q + 6 + \frac{13}{Q}$ where Q is the quantity produced.

The approx. cost at Q = 15 is:

(a) 42 (b) 36 **(c) 66** (d) 130

July-2021

If $f(x) = 3_e x^4$ then $f^1(x) - 4x^3 fx + \left(\frac{1}{3}\right) f(0) - f^1(0)$ is equal to:

(a) 0 (b) ex^2 **(c) 1** (d) -1

Dec-2022

If $x^6 + y^4 - 5xy = 0$ then $\frac{dy}{dx}$ is

(a) $\frac{y+x^4}{x+y^4}$ (b) $\frac{y-x}{y-x}$ (c) $\frac{x-y}{x^3-y}$ (d) $\frac{x+y^4}{x^4+y}$

If $y = x^x$, then dy/dx at x = 1 is equal to

(a) 0 (b) 1 (c) -1 (d) 2

Integration

Basics

1. Given f (x) = $4x^3+3x^2-2x+5$ and $\int f(x)dx$ is
(a) $x^4+x^3-x^2+5x+k$
(b) $x^4+x^3-x^2+5x$
(c) $12x^2+6x-2x^2$
(d) none of these

2. $\int \left(x^4+\frac{3}{x}\right)dx$ *is equal to*
(a) $x^5/5+\log|x|$
(b) $1/5x^5+3\log|x|+k$
(c) $1/5x^5+k$
(d) none of these

3. Evaluate $\int(x^2-1)\,dx$
(a) $x^5/5-2/3x^3+x+k$ **(b)** $\frac{x^3}{3}-x+k$
(c) 2x **(d)** none of these

Method of Substitution

4. Use method of substitution to evaluate $\int x(x^2+4)^5\,dx$and the answer is
(a) $(x^2+4)^6+k$ **(b)** $1/12\,(x^2+4)^6+k$
(c) $(x^2+4)^6/+k$ **(d)** none of these

5. $\int x^x(1+\log x)\,dx$ is equal to
(a) $x^2\log x+k$ **(b)** $e^{x^2}+k$
(c) $\frac{x^2}{2}+k$ **(d)** x^x+c

6. $\int x^x(1+\log x)\,dx$ is equal to
(a) $x^2\log x+k$ **(b)** $e^{x^2}+k$
(c) $\frac{x^2}{2}+k$ **(d)** x^x+c

7. $\int \frac{\log(\log x)}{x}dx$ *is*
(a) log (logx-1) +k **(b)** log x-1+k
(c) log (logx-1)] log x +k **(d)** none

8. Evaluate $\int(\frac{e^x-e^{-x}}{e^x+e^{-x}})$ dx and the value is
(a) $\log_e|e^x+e^{-x}|$ **(b)** $\log_e|e^x+e^{-x}|+k$
(c) $\log_e|e^x-e^{-x}|+k$ **(d)** none

By Parts

9. Use integration by parts to evaluate $\int x^2e^{3x}dx$
(a) $\frac{x^2e^{3x}}{3}-2x\frac{e^{3x}}{9}+\frac{2}{27}e^{3x}+K$
(b) $x^2e^{3x}-2xe^{3x}+2e^{3x}+k$
(c) $\frac{e^{3x}}{3}-\frac{xe^{3x}}{9}+2e^{3x}+k$
(d) none of these

10. $\int(\log x)^2x\,dx$ *and the result is*
(a) $\frac{x^2}{2}[(\log x)^2-\log+½]+K$
(b) x $(\log)^2$ -2x+k
(c) 2x $(\log x-1)$ +k
(d) None of these

11. $\int \log x^2$ dx is equal to
(a) x (log x -1)+k **(b)** 2x (logx -1)+k
(c) 2 (log x- 1)+k **(d)** none of these

12. Using integration by parts $\int x^3\log x\,dx$
(a) $x^4/16+k$ **(b)** $x^4/16\,(4\log x-1)+k$
(c) 4 log x-1+k **(d)** none of these

Exponential Based

13. Evaluate $\int\frac{(2-x)e^x}{(1-x)^2}dx$ and the value is
(a) $\frac{e^x}{1-x}+k$ **(b)** e^x+k
(c) $\frac{1}{1-x}+k$ **(d)** none of these

14. $\int\frac{e^x}{(1+x)^3}dx-\int\frac{e^x}{2(1+x)^2}dx$ = ___
(a) 0
(b) $\frac{e^x}{2(1+x)^2}+C$
(c) $-\frac{e^x}{2(1+x)^2}+C$
(d) $\frac{e^x}{(1+x)^2}+C$

Partial Fraction

16. x $(x-1)^{-1}(2x+1)^{-1}dx$ *is*:
(a) (1/3)[log |x-1|+log|2x+1|] +k
(b)(1/3)[log |x-1|+(1/6) log|2x+1|] k
(c)(1/3)[log |x-1| + (1/2) log|2x+1|] +k
(d)none of these.

17. Evaluate using partial fraction $\int(x+5)dx/(x+1)(x+2)^2$ we get
(a) 4 log (x+1) - 4 log (x+2) + $\frac{3}{x}$ +2+ K
(b) 1 log (x+2)-3/x+2)+K
(c) 4log (x+1)-4log (x+2)
(d) none of these

18. $\int\frac{x}{(x^2+1)(x^2+2)}$dx is equal to _____
(a) $\log\left(\frac{x^2+1}{x^2+2}\right)+c$ **(b)** $\frac{1}{2}\log\left(\frac{x^2+1}{x^2+2}\right)+c$
(c) $\frac{1}{2}\log\left(\frac{x^2+2}{x^2+1}\right)+c$ (d) $-\log\left(\frac{x^2+1}{x^2+2}\right)+c$

Geometry Based

19. The equation of the curve which passes through the point (1,3) and has the slope 4x-3 at any point (x,y) is
(a) $y=2x^3-3x+4$
(b) $y=2x^2-3x+4$
(c) $x=2y^2-3y+4$
(d) none of these

27. 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
Dec-2022

Definite Integration

20. Evaluate $\int_2^4(3x-2)^2$ dx and the value is
(a) 104 **(b)** 100
(c) 10 **(d)** none

21. Evaluate $\int_0^1 xe^x\,dx$ dx and the value is
(a) -1 **(b)** 10
(c) 10/9 **(d) +1**

22. Evaluate $\int_1^4(2x+5)$ dx and the value is
(a) 3 **(b)** 10
(c) 30 **(d)** none

23. $\int_1^2\frac{2x}{1+x^2}$ dx is equal to
(a) $\log(5/2)$
(b) $\log_e 5-\log_e 2+k$
(c) $\log_e(2/5)$
(d) none of these

24. $\int_0^2\sqrt{3x+4}$ dx is equal to
(a) 9/112
(b) 112/9
(c) 11/9
(d) none of these

25. The value of $\int_2^3 f(5-x)\,dx-\int_2^3 f(x)\,dx$ *is*
(a) 1 **(b) 0** **(c)** -1 **(d)** none

26. $\int_1^2\frac{x\,dx}{x^2+2}$ = _____
(a) $\log\sqrt{2}$ (b) $\log\sqrt{3}$
(c) $\log\frac{1}{\sqrt{2}}$ (d) $\log\frac{1}{\sqrt{3}}$

Previous Year Questions

Level-1

June-2009

$\int \left(\sqrt{x} + \frac{1}{\sqrt{x}}\right) dx$

(a) $2x^{1/2}\left(\frac{1}{3}x - 1\right)$ **(b) $2x^{1/2}\left(\frac{1}{3}x + 1\right)$**

(c) $2\left(\frac{1}{3}x + x^{1/2}\right)$ (d) None

June-2009

$\int_0^1 \left(\frac{1-x}{1+x}\right) dx$

(a) 2 log 2 - 1 (b) 4 log 2 - 1

(c) 2 log 2 (d) None

Dec-2010

$\int \frac{6x+4}{(x-2)(x-3)} dx$ is equal to

(a) 22 log (x-3) -16 (x-2)

(b) 11 log (x-3) - 8 (x-2)

(c) 22 log (x-3) -16 log (x-2)

(d) 22 log (x-3) + 16 log (x-2)

Dec-2010

$\int \frac{1}{x(1+\log x)^2} dx$ is equal to

(a) $-\frac{1}{2(1+\log x)^2} + c$ (b) $\frac{1}{(1+\log x)} + c$

(c) $-\frac{1}{(1+\log x)} + c$ (d) None

June-2011

Solve : $\int \frac{(\log x^x)^2}{x^3} dx$

(a) $\frac{3}{2}(\log x)^3 + C$ **(b) $\frac{1}{3}(\log x)^3 + C$**

(c) $\frac{1}{6}(\log x)^3 + C$ (d) $\frac{3}{7}(\log x)^3 + C$

Level-2

Dec-2011

$\int_{-1}^{1} \frac{|x|}{x} dx$ = _____

(a) - 1 **(b) 0**

(c) 1 (d) 2

June-2012

$\int_0^1 \frac{dx}{[ax+b(1-x)]^2}$ = _____

(a) a/b (b) b/a

(c) ab **(d) 1/ab**

Dec-2012

$\int 2^{3x} \cdot 3^{2x} \cdot 5^x dx$ = _____

(a) $\frac{2^{3x} \cdot 3^{2x} \cdot 5^x}{\log(720)} + c$ **(b) $\frac{2^{3x} \cdot 3^{2x} \cdot 5^x}{\log(360)} + c$**

(c) $\frac{2^{3x} \cdot 3^{2x} \cdot 5^x}{\log(180)} + c$ (d) $\frac{2^{3x} \cdot 3^{2x} \cdot 5^x}{\log(90)} + c$

June-2014

$\int_0^5 \frac{x^2 dx}{x^2+(5-x)^2}$ is equals to _____.

(a) 5 **(b) $\frac{5}{2}$**

(c) 1 (d) None

Dec-2014

The value of definite integral $\int_0^2 |1 - x| dx$ = _____.

(a) 0 (b) 1/2

(c) 3/2 **(d) 1**

Level-3

June-2016

$\int_0^2 \frac{3^{\sqrt{x}}}{\sqrt{x}} dx$ is equal to _____

(a) $\frac{2\sqrt{2}}{\log_e 3}$ (b) 0

(c) $\frac{2}{\log_e 3}\left(3^{\sqrt{2}} - 1\right)$ (d) $\frac{3^{\sqrt{2}}}{\sqrt{2}}$

June-2016

$\int_0^2 \frac{3^{\sqrt{x}}}{\sqrt{x}} dx$ is equal to _____

(a) $\frac{2\sqrt{2}}{\log_e 3}$ (b) 0

(c) $\frac{2}{\log_e 3}\left(3^{\sqrt{2}} - 1\right)$ (d) $\frac{3^{\sqrt{2}}}{\sqrt{2}}$

May-2018 **June-2019** **Nov-2020** (Value Changed)

$\int_2^3 \frac{\sqrt{x}}{\sqrt{5-x}+\sqrt{x}} dx$ =

(a) 1 **(b) 1/2**

(c) 2 (d) 3/2

Jan-2021

$\int_1^2 e^x \left(\frac{1}{x} - \frac{1}{x^2}\right) dx$ =

(a) $e\left(\frac{e}{2} - 1\right)$ (b) a (e - 1)

(c) a (d) e^2 (e - 1)

July-2021

If $f(x) = 3e^{x^4}$ then $f^1(x) - 4x^3 f(x) + \left(\frac{1}{3}\right)[f(0) - f^1(0)]$ is equal to:

(a) 0 (b) ex^2

(c) 1 (d) -1

Measure of Central Tendency

Mean

12. If there are 3 observations 15, 20, 25 than the sum of deviation of the observation from their AM is
(a) 0 **(b)** 5
(c) -5 **(d)** none

13. If there are two groups containing 30 and 20 observations and having 50 and 60 as arithmetic means, then the combined arithmetic mean is
(a)55 **(b)**56
(c) 54 **(d)** 52

14. The average salary of a group of unskilled workers is Rs 10,000 and that of a group of skilled workers is Rs 15,000. If the combined salary is Rs 12,000, then what is the percentage of skilled workers?
(a)40% **(b)**50%
(c) 60% **(d)** none

15. The mean salary of a group of 50 persons is Rs 5,850. Later on it is discovered that the salary of one employee has been wrongly taken as Rs 8,000 instead of Rs 7,800. The corrected mean salary is
(a) Rs 5,854 **(b)**Rs 5,846
(c) Rs 5,650 **(d)** none

16. The average age of 15 students of a class is 15 years. Out of them, the average age of 5 students is 14 years and that of other 9 students is 6 years. The age of the 15th students is:
(a)11 years **(c)** 15 years
(b)14 years **(d)** none of these

Patriation Value

8. What is the median for the following observations? 5, 8, 6, 9, 11, 4.
(a)6 **(c)** 8
(b)7 **(d)** none of these

9. What is the value of the first quartile for observations 15, 18, 10, 20, 23, 28, 12, 16?
(a)17 **(c)** 12.75
(b)16 **(d)** 12

10. The third decile for the numbers 15, 10, 20, 25, 18, 11, 9, 12 is
(a)13 **(c)** 11
(b)10.70 **(d)** 11.50

11. If the difference between mean and mode is 63, then the difference between mean and median will be_____.
(a)63 **(c)** 21
(b)31.5 **(d)** none of the above

Mode

18. What is the modal value for the numbers 5, 8, 6, 4, 10, 15, 18, 10?
(a)18 **(c)** 14
(b)10 **(d)** none of these

19. Find the mode of the following:

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

GM & HM

1. What is the GM for the numbers 8, 24 and 40?
(a)24 **(b)**12
(c) $8.\sqrt[3]{15}$ **(d)** 10

2. If GM of x is 10 and GM of y is 15, then the GM of xy is
(a)150 **(c)** log 150
(b) Log 10 × log 15 **(d)** none

3. The harmonic mean for the numbers 2, 3, 5 is
(a) 2. 00 **(c)** 2.90
(b) 3.33 **(d)** $-\sqrt[3]{30}$

4. An aero plane flies from A to B at the rate of 500 km/hour and comes back from B to A at the rate of 700 km/hour. The average speed of the aero plane is
(a)600 km/hr **(b)** 583.33 km/hr
(c) $100\sqrt{35}$ km/hr **(d)** 620 km/hr

5. Given the weights for the numbers $1,2,3\ldots n$ are respectively $1^2,2^2,3^2\ldots n^2$ then weighted HM is _
(a) $\frac{2n+1}{4}$ (b) $\frac{2n+1}{6}$
(c) $\frac{2n+1}{3}$ (d) $\frac{2n+1}{2}$

Property Based

6. Two variables x and y are given by y = 2x – 3. If the median of x is 20, what is the median of y?
(a)20 **(c)** 37
(b)40 **(d)** 35

7. If the relationship between two variables u and v are given by 2u + v + 7 = 0 and if the AM of u is 10, then the AM of v is
(a) 17 **(c)** -27
(b) -17 **(d)** 27

Relation B/W GM & HM

17. If the Arithmetic mean between two numbers is 64 and the geometric mean between them is 16. The Harmonic mean between them is _____.
(a)64 **(b)** 16 **(c)** 4 **(d)** 40

18. The harmonic mean H of two numbers is 4 and their arithmetic mean A and the geometric mean G satisfy the equation $2A + G^2 = 27$, then the numbers are
(a)(1, 3) **(c)** (6, 3)
(b)(9, 5) **(d)** (12, 7)

Previous Year Questions

Level-1

June-2009

The average salary of 50 men was Rs. 80 but it was found that salary of 2 of them were Rs. 46 and Rs. 28 which was wrongly taken as Rs. 64 and Rs. 82. The revised average salary is :
(a) Rs. 80 **(b) Rs. 78.56**
(c) Rs. 85.26 (d) Rs. 82.92

June-2009

The sum of squares of deviation from mean of 10 observations is 250. Mean of the data is 10. Find the co-efficient of variation.
(a) 10% (b) 25%
(c) 50 % (d) 0 %

Dec-2009

If variance of x is 5, then find the variance of (2 - 3x)
(a) 10 **(b) 45**
(c) 5 (d) -13

June-2010

The harmonic mean of 1, 1/2, 1/3 ……. 1/n is
(a) 1/(n + 1) **(b) 2/(n + 1)**
(c) (n + 1)/2 (d) 1/(n - 1)

June-2010

In a class of 11 students, 3 students were failed in a test. 8 students who passed secured 10, 11, 20, 15, 12, 14, 26 and 24 marks respectively. What will be the median marks of the students:
(a) 12 (b) 15
(c) 13 (d) 13.5

Level-2

June-2011

If the difference between mean and Mode is 63, then the difference between Mean and Median will be _____.
(a) 63 (b) 31.5 **(c) 21** (d) None

Dec-2011

The standard deviation of the weights (in kg) of the students of a class of 50 students was calculated to be 4.5 kg. Later on it was found that due to some fault in weighing machine, the weight of each student was under measured by 0.5 kg. The Correct standard deviation of the weight will be:
(a) Less than 4.5 (b) Greater than 4.5
(c) Equal to 4.5 (d) Can not be determined

Dec-2011

The median of following numbers, which are given is ascending order is 25. Find the Value of X.
11 13 15 19 (x + 2) (x + 4) 30 35 39 46
(a) 22 (b) 20 (c) 15 (d) 30

June-2012

Geometric Mean of three observations 40, 50 and X is 10. The value of X is
(a) 2 (b) 4 **(c) 1/2** (d) None

June-2012

The mean of the following data is 6. Find the value of 'P'.

x:	2	4	6	10	P+5
f:	3	2	3	1	2

(a) 4 (b) 6 (c) 8 **(d) 7**

Level-3

June-2011

If the difference between mean and Mode is 63, then the difference between Mean and Median will be _____.
(a) 63 (b) 31.5 **(c) 21** (d) None

June-2015

The harmonic mean H of two numbers is 4 and their arithmetic mean A and the geometric mean G satisfy the equation $2A + G^2 = 27$, then the numbers are
(a) (1,3) (b) (9,5)
(c) (6,3) (d) (12,7)

Nov-2018

If total frequencies of three series are 50, 60 and 90 and their means are 12, 15 and 20 respectively, then the mean of their composite series is
(a) 16 (b) 15.5
(c) 16.5 (d) 14.5

Nov-2018

There are n numbers. When 50 is subtracted from each of these number the sum of the numbers so obtained is - 10. When 46 is subtracted from each of the original n numbers, then the sum of numbers. So obtained is 70. What is the mean of the original n numbers?
(a) 56.8
(b) 25.7
(c) 49.5
(d) 53.8

Measure of Dispersion

Range

12. What is the coefficient of range for the following wages of 8 workers?
Rs 80, Rs 65, Rs 90, Rs 60, Rs 75, Rs 70, Rs 72, Rs 85.
(a) Rs 30 (c) 30
(b) Rs 20 (d) 20

13. For the observation of 6, 4, 1, 6, 5, 10, 4, 8 the range is :
(a)10 (c) 8
(b) 9 (d) none

14. What is the coefficient of range for the following distribution?

C.I	10 - 19	20 - 29	30 - 39	40 - 49	50 – 59
F	11	25	16	7	3

(a) 22 (c) 72.46
(b)50 (d) 75.82

15. If the range of x is 2, what would be range of -3x + 50?
(a) 2 (c) -6
(b) 6 (d) 44

Mean Deviation

9. Coefficient of mean deviation about mean for the first 9 natural numbers is
(a)200/9 (c) 400/9
(b)80 (d) 50

10. What is the value of mean deviation about mean for the numbers?
5, 8, 6, 3, 4.
(a) 5.20 (c) 1.44
(b) 7.20 (d) 2.23

11. What is the value of mean deviation about for the following observations?
50, 60, 50, 50, 60, 60, 60, 50,50, 50, 60, 60, 60, 50.
(a) 5 (c) 35
(b) 7 (d) 10

Common Property

16. If a variance of a random variable 'x' is 23, then what is variance of 2x + 10?
(a)56 (b)33
(c) 46 (d) 92

Quartile Deviation

6. If mean = 5, standard deviation = 2.6, median = 5 and quartile deviation = 1.5, then the coefficient of quartile deviation equals
(a)35 (c) 30
(b)39 (d) 32

7. The quartile deviation is:
(a) 2/3 of S.D
(b) 4/5 of S.D
(c) 5/6 of S.D
(d) None of these

8. The quartiles of a variable are 45, 52 and 65 respectively. Its quartile deviation is
(a) 10 (c) 25
(b) 20 (d) 8.30

Variance

17. Which of the following companies A or B is more consistent so far as the payment of dividend is concerned?
Dividend paid by A:
5 9 6 12 15 10 8 10
Dividend paid by B:
4 8 7 15 18 9 6 6
(a) A (b) B
(c) Both A & B (d) Neither A nor B

18. If variance = 148.6 and $\overline{x}$ = 40, then the coefficient of variation is:
(a) 37.15 (b) 30.48
(c) 33.75 (d) None

Standard Deviation

1. If mean and coefficient of variation of the marks of 10 students is 20 and 80 respectively. What will be variance of them?
(a)256 (b) 16
(c) 25 (d) None

2. The mean and SD of a sample of 100 observations were calculated as 40 and 5.1 respectively by a CA student who took one of the observations as 50 instead of 40 by mistake. The current value of SD would be
(a)4.90 (c) 4.88
(b)5.00 (d) 4.85

3. The variance of data: 3,4,5,8 is
(a) 4.5 (**b) 3.5**
(c) 5.5 (d) 6.5

4. The standard deviation of a variable x is known to be 10. The standard deviation of 50 + 5x is
(a) 50 (b) 100
(c) 10 (d) 500

5. If the S.D. of the 1st n natural Nos. is $\sqrt{30}$, Then the value of n is
(a) 19 (b) 20
(c) 21 (d) None

Previous Year Questions

Level-1

June-2009

Inter Quartile Range is _____ of Quartile Deviation.
(a) Half **(b) Double**
(c) Triple (d) Equal

Dec-2009

The equation of a line is 5x + 2y = 17. Mean deviation of y about mean is 5. Calculate mean deviation of x about mean.
(a) -2 **(b) 2** (c) -4 (d) None

June-2011

The average of 5 quantities is 6 and the average of 3 is 8. what is the average of the remaining two.
(a) 4 (b) 5 **(c) 3** (d) 3.5

June-2012

If standard deviation of first 'n' natural numbers is 2 then value of 'n' is
(a) 10 **(b) 7** (c) 6 (d) 5

June-2013

If sum of squares of the values = 3390, N = 30 and standard deviation = 7, find out the mean.
(a) 113 (b) 210 (c) **8** (d) None

June-2013

Find at the variance given that the Arithmetic Mean = (8 + 4)/2
(a) 2 (b) 6
(c) 1 (d) **4**

Level-2

June-2013

If the mean of a frequency distribution is 100 and coefficient of variation is 45% then standard deviation is:
(a) 45 (b) 0.45
(c) 4.5 (d) 450

Dec-2013

If mean = 5, Standard deviation = 2.6, median = 5 and quartile deviation = 1.5, then the coefficient of quartile deviation equals
(a) 35 (b) 39
(c) 30 (d) 32

Dec-2013

If mean = 5, Standard deviation = 2.6, median = 5 and quartile deviation = 1.5, then the coefficient of quartile deviation equals
(a) 35 (b) 39
(c) 30 (d) 32

June-2014

What will be the probable value of mean deviation? When $Q_3 = 40$ and $Q_1 = 15$
(a) 17.50 (b) 18.75
(c) 15.00 (d) None

June-2014

The formula for range of middle 50% items of a series is :
(a) $Q_3 - Q_1$ (b) $Q_3 - Q_2$
(c) $Q_2 - Q_1$ **(d)** $\frac{Q_3 - Q_1}{2}$

Level-3

Dec-2014

If the first quartile is 142 and semi-inter quartile range is 18, then the value of median is:
(a) 151 **(b) 160**
(c) 178 (d) None

Dec-2015

If a variance of a random variable 'x' is 23, then what is variance of 2x + 10?
(a) 56 (b) 33
(c) 46 **(d) 92**

Dec-2015

If arithmetic mean and coefficient of variation of x are 10 and 40, respectively then the variance of $-15 + \frac{3x}{2}$ will be:
(a) 64 (b) 81
(c) 49 **(d) 36**

May-2018

For 899, 999, 391, 384, 390, 480, 485, 760, 111, 240 Rank of median is
(a) 2.75 **(b) 5.5**
(c) 8.25 (d) none

July-2021

The standard deviation of 1 to 9 natural number is:
(a) 6.65
(b) 2,58
(c) 6.75
(d) 5.62

Correlation Analysis

Karl Pearson Method

10. Compute the co-efficient between x & y from the following data n = 10, $\sum xy = 220, \sum x^2 = 200, \sum y^2 = 262, \sum x = 40, \sum y = 50$
(a)0.91 **(c)** 0.4
(b)0.625 **(d)** 0.5

11. If for two variables x and y, the covariance, variance of x and variance of y are 40, 16 and 256 respectively, what is the value of the correlation coefficient?
(a)0.01 **(c)** 0.4
(b)0.625 **(d)** 0.5

12. If the covariance between two variables is 20 and the variance of one of the variables is 16, what would be the variance of the other variable?
(a) More than 100
(b) More than 10
(c) less than 10
(d) more than 1.25

13. If the sum of the product of deviations of x and y series from their means is zero, then the coefficient of correlation will be
(a) 1 (b) -1
(c) 0 (d) None

14. The covariance between two variables X and Y is 8.4 and their variances are 25 and 36 respectively. Calculate Karl Pearson's coefficient of correlation between them.
(a) 0.82 **(b) 0.28**
(c) 0.01 (d) 0.09

Spearman Rank

6. If the sum of squares of difference of ranks, given by two judges A and B, of 8 students in 21, what is the value of rank correlation coefficient?
(a)0.7 **(c)** 0.75
(b)0 .65 **(d)** 0.8

7. If the rank correlation coefficient between marks in management and mathematics for a group of students in 0.6 and the sum of squares of the differences in ranks in 66, what is the number of students in the group?
(a)10 **(c)** 8
(b)9 **(d)** 11

8. While computing rank correlation coefficient between profit and investment for the last 6 years of a company the difference in rank for a year was taken 3 instead of 4. What is the rectified rank correlation coefficient if it is known that the original value of rank correlation coefficient was 0.4?
(a)0.3 **(c)** 0.25
(b)0.2 **(d)** 0.28

9. Ranks of two ____characteristics by two judges are in reverse order then find the value of Spearman rank correlation co-efficient.
(a) -1 (b) 0
(c) 1 (d) 0.75

Coefficient of Concurrent

1. For 10 pairs of observations no. of concurrent deviations was found to be 4. What is the value of the coefficient of concurrent deviation?
(a)$\sqrt{0.2}$ **(c)** 1/3
(b) $-\sqrt{0.2}$ **(d)** -1/3

2. The coefficient of concurrent deviation for p pairs of observations was found to be $1/\sqrt{3}$. If the number of concurrent deviations was found to be 6, then the value of p is
(a)10 **(c)** 8
(b)9 **(d)** none

3. If the rank correlation co-efficient between marks in Management and Mathematics for a group of students is 0.6 and the sum of the squares of the difference in ranks is 66. Then what is the number of students in the group?
(a) 9 **(b) 10**
(c) 11 (d) 12

Scatter Diagram

Property Based

4. If u + 5x = 6 and 3y – 7v = 20 and the correlation coefficient between x and y is 0.58 then what would be the correlation coefficient between u and v?
(a) 0.58 **(c)** -0.84
(b)-0.58 **(d)** 0.84

5. If the relation between x and u is 3x + 4u + 7 = 0 and the correlation coefficient between x and y is -0.6, then what is the correlation coefficient between u and y?
(a)-0.6 **(c)** 0.6
(b)0.8 **(d)** -0.8

Other

15. If r = 0.6 then the coefficient of non-determination is
(a)0.4 **(c)** 0.36
(b)-0.6 **(d)** 0.64

16. A relationship $r^2 = 1 - \frac{500}{300}$ is not possible
(a) True **(c)** both
(b) False **(d)** none

Previous Year Questions

Level-1

Dec-2009

Correlation coefficient between X and Y will be negative when: -
(a) X and Y are decreasing
(b) X is increasing, Y is decreasing
(c) X and Y are increasing
(d) None

June-2010

If 'P' is the simple correlation coefficient, the quantity P^2 is known as:
(a) Coefficient of determination
(b) Coefficient of Non-determination
(c) Coefficient of alienation
(d) None

Dec-2010

_____ of the regression Coefficients is greater than the correlation coefficient
(a) Combined mean (b) Harmonic mean
(c) Geometric mean **(d) Arithmetic mean**

Dec-2012

The Coefficient of correlation between x and y series is - 0.38. The linear relation between x & u and y & v are 3x + 5v = 3 and - 8x - 7v = 44, what is the coefficient of correlation between u & v?
(a) 0.38 **(b) -0.38** (c) 0.40 (d) None

Dec-2012

If 'r' be the Karl's Pearson's coefficient of correlation in a bivariate distribution then the two regression lines are at right angle if
(a) r = ± 1
(b) r = 0
(c) r = ± any finite value whose numerical value is less than 1
(d) None

Level-2

June-2013

The coefficient of correlation between two variables x and y is 0.28. Their covariance is 7.6. If the variance of x is S, then the standard deviation of y is:
(a) 8.048 **(b) 9.048**
(c) 10 048 (d) 11.048

June-2013

Determine the coefficient of correlation between x and y series:

	x Series	y Series
No. of items	15	15
Arithmetic Mean	25	18
Sum of Squares of Deviations from Mean	136	138

Sum of products of Deviations of x and y series from Mean = 122
(a) -0.89 **(b) 0.89**
(c) 0.69 (d) - 0.69

June-2014

When each individual gets the exactly opposite rank by the two Judges, then the rank correlation will be _____.
(a) 0 **(b) -1** (c) +1 (d) $\frac{1}{2}$

June-2016

If r = 0.6, then the coefficient of determination is.
(a) 0.4 (b) -0.6
(c) 0.36 (d) 0.64

Level-3

June-2013

The coefficient of correlation between two variables x and y is 0.28. Their covariance is 7.6. If the variance of x is S, then the standard deviation of y is:
(a) 8.048 **(b) 9.048**
(c) 10 048 (d) 11.048

Nov-2018

If the correlation coefficient between the variables X and Y is 0.5, then the correlation coefficient between the variables 2x - 4 and 3 - 2y is
(a) 1 (b) 0.5
(c) -0.5 (d) 0

Nov-2018

If the correlation coefficient between the variables X and Y is 0.5, then the correlation coefficient between the variables 2x - 4 and 3 - 2y is
(a) 1 (b) 0.5
(c) -0.5 (d) 0

July-2021

If the sum of the product of the deviations of X and Y from their means is zero the correlation coefficient between X and Y is:
(a) Zero (b) Positive
(c) Negative (d) 10

June-2022

If Coefficient of correlation 3x + 4y = 0.6 is 0.5. Find the coefficient for 3u + 9v for u and v.
(a) -(0.5) **(b) +(0.5)**
(c) ± 0.5 (d) 0.25

Regression Analysis

AIM-1 Regression Coefficient

1. The regression coefficient of X on Y of the following data.
N = 10; ΣX = 250; ∑Y = 210; Σ(X-25)² = 262; Σ(Y - 21)² = 322 , Σ(X - 25)(Y - 21) = 192 is
(a) 0.596 **(b)** -0.414
(c) 0.568 **(d)** None

2. The regression coefficient of Y on X (b_{yx}) of the following data cov. (X ; Y) = 121; $\sigma_x = 15$; $\sigma_y = 14$ is
(a) 0.54 **(b)** 0.55
(c) 0.6875 **(d)** None

3. In a correlation study of two variables X and Y, the following values are obtained: $\overline{X} = 45$, $\overline{Y} = 54$, $\sigma_x = 4$; $\sigma_y = 5$; r = 0.8, The two regression coefficients (b_{xy}, b_{yx}) are
(a) (5 . 57,3. 12) **(b)** (0.64, 1.00)
(c) (7.12,2.67) **(d)** None of these

4. The regression equation x and y is 3x + 2y = 100, the value of b_{xy}
(a) $-\frac{2}{3}$ **(b)** $\frac{3}{2}$ **(c)** $\frac{100}{3}$ **(d)** $\frac{2}{3}$

AIM-2 Regression Line

5. Following are the two normal equations obtained for deriving the regression line of y and x:
5a + 10b = 40
10a + 25b = 95
The regression line of y on x is given by
(a) 2x + 3y = 5 **(b)** y = 2 + 3x
(c) 2y + 3x = 5 **(d)** y = 3 + 5x

6. Given the regression equations as 3x + y = 13 and 2x + 5y = 20, which one is the regression equation of y on x?
(a) 1st equation
(b) both (a) and (b)
(c) 2nd equation
(d) none of these

7. 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 (x - 40)

Correlation & Regression

8. If the regression line of y on x and that of x on y are given by y = -2x + 3 and 8x = -y + 3 respectively, what is the coefficient of correlation between x and y?
(a) 0.5 **(b)** -0.5
(c) $-1/\sqrt{2}$ **(d)** none of these

9. If the regression coefficient of y on x, the coefficient of correlation between x and y and variance of y are -3/4, $\frac{\sqrt{3}}{2}$ and 4 respectively, what is the variance of x?
(a) $2/\sqrt{3/2}$ **(b)** 4/3
(c) 16/3 **(d)** 4

10. In a bivariate distribution b_{xy} = 0.49 and b_{yx} = 0.25, then the coefficient of determination is given by:
(a) 0.1313 **(b)** 0.1225
(c) 0.1523 **(d)** None

11. If the correlation coefficient between two variables X and Y is 0.5 and the regression coefficient of X on Y is 0.2, then the regression coefficient of Y on X is:
(a) 0.7 **(b)** ±0.5
(c) 1.25 **(d)** None

Property Based

12. If u = 2x + 5 and v = -3y – 6 and regression coefficient of y on x is 2.4, what is the regression coefficient of v on u?
(a) 3.6 **(b)** 2.4
(c) -3.6 **(d)** -2.4

13. If 4y – 5x = 15 is the regression line of y on x and the coefficient of correlation between x and y is 0.75, what is the value of the regression coefficient of x on y?
(a) 0.45 **(b)** 0.6
(c) 0.9375 **(d)** none

14. If y = 3x + 4 is the regression line of y on x and the arithmetic mean of x is -1, what is the arithmetic mean of y?
(a) 1 **(b)** 7
(c) -1 **(d)** none

15. If the regression line of y on x and of x on y are given by 2x + 3y = -1 and 5x + 6y = -1 then the arithmetic means of x and y are given by
(a) (1, -1) **(b)** (-1, -1)
(c) (-1, 1) **(d)** (2, 3)

AIM-3 Regression Lines

16. Find the regression equation from the following data:
If ∑X = 34, ΣY = 56, ΣXY = 351, $\Sigma X^2 = 234$, $\Sigma Y^2 = 554$, N = 6
Hence estimate Y when X is 10 and estimate also x when Y is 12.
(a) 12 & 13 **(b)** 12.60 & 15.89
(c) 11.76 & 15.30 **(d)** none

Previous Year Questions

Level-1

Dec-2009

The two regression lines are 7x - 3y - 18 = 0 and 4x - y - 11 = 0. Find the values of b_{yx} and b_{xy}
(a) 7/3, 1/4 (b) -7/3,-1/4
(c) -3/7, -1/4 (d) None

June-2010

_____ of the regression Coefficients is greater than the correlation coefficient
(a) Combined mean (b) Harmonic mean
(c) Geometric mean **(d) Arithmetic mean**

Dec-2010

Given : $\bar{x}$ = 16 , σx = 4.8
$\bar{y}$ = 20 , σy = 9.6
The coefficient of correlation between x and y is 0.6. What will be the regression coefficient of 'x' on 'y'?
(a) 0.03 **(b) 0.3**
(c) 0.2 (d) 0.05

Dec-2011

For a bivariate data, the lines of regression of Y on X, and of X on Y are respectively 2.5Y - X = 35 and 10X - Y = 70, then the Correlation coefficient r is equal to:
(a) 0.2 (b) -0.2
(c) 0.5 (d) - 0.5

June-2012

If 2 variables are uncorrelated, their regression lines are:
(a) Parallel **(b) Perpendicular**
(c) Coincident (d) Inclined at 45 degrees

Level-2

June-2013

If the regression equations are 8x - 3y + 50 = 0 and 14x - 7y - 60 = 0 and standard deviation of y is 1. The coefficient of correlation is = _____
(a) 2 (b) 1
(c) 0.87 (d) -0.87

Dec-2013

If mean of x and y variables is 20 and 40 respectively and the regression coefficient of y on x is 1.608, then the regression line of y on x is
(a) y = 1.608x + 7.84 (b) y = 1.5x + 4.84
(c) y = 1.608x + 4.84 (d) y = 1.56x + 7.84

Dec-2014

If the value of correlation coefficient between x & y is 1, then the value of correlation coefficient between x - 2 and $\frac{-y}{2}$ + 1 is:
(a) 1 **(b) -1**
(c) -1/2 (d) 1/2

June-2015

Two regression lines are
16x - 20y + 132 = 0
80x - 36y - 428 = 0
The value of the correlation coefficient is
(a) 0.6 (b) -0.6 (c) 0.54 (d) 0.45

Dec-2015

In case of "Insurance Companies" profits and the number of claims they have to pay there is _____ correlation.
(a) Positive **(b) Negative** (c) No correlation (d) None

Level-3

Nov-2018

If the two regression lines are 3X = Y and 8Y = 6X, then the value of correlation coefficient is
(a) 0.5 (b) -0.5
(c) 0.75 (d) -0.80

June-2019

Find the probable error if r = $\frac{2}{\sqrt{10}}$ and n = 36
(a) 0.6745 **(b) 0.067**
(c) 0.5287 (d) None

June-2019

If the regression line of y on x is given by y = x + 2 and Karl Pearson's coefficient of correlation is 0.5 then $\frac{\sigma y^2}{\sigma x^2}$ = _____.
(a) 3 (b) 2 **(c) 4** (d) None

July-2021

If y = 9x and x = 0.01 y then r is equal to:
(a) -0.1 (b) 0.1 **(c) +0.3** (d) -0.3

July-2021

The straight -line graph of the linear equation y = a + b x, slope is horizontal if:
(a) b = 1 (b) b ≠ 0
(c) b = 0 (d) a = b ≠ 0

July-2021

If the slope of the regression line is calculated to be 5.5 and the intercept 15 then the value of Y and X is 6 is:
(a) 88 **(b) 48** (c) 18 (d) 78

Probability

Sample Space

1. From a group of 2 boys and 3 girls, two children are selected. Find the sample space associated to this random experiment.

2. A coin is tossed. If it shows head, we draw a ball from a bag consisting of 3 red and 4 black balls; if it shows tail, we throw a die. What is the sample associated to this experiment?

3. An experiment consists of rolling a die and then tossing a coin once if the number on the die is even. If the number on the die is odd, the coin is tossed twice. Write the sample space for this experiment.

4. A coin is tossed. If the result is a head, a die is thrown. If the die shows up an even number, the die is thrown again. What is the sample space for this experiment?

Single Event

5. Two balls are drawn from a bag containing 5 white and 7 black balls at random. What is the probability that they would be of different colors?
(a) 35/66 (b) 30/66
(c) 12/66 (d) None

6. What is the chance of throwing at least 7 in a single cast with 2 dice?
(a) 5/12 (b) 7/12
(c) 1/4 (d) 17/36

7. If two unbiased dice are rolled together, what is the probability of getting no difference of points?
(a) 1/2 (b) 1/3
(c) 1/5 (d) 1/6

8. A packet of 10 electronic components is known to include 2 defectives. If a sample of 4 components is selected at random from the packet, what is the probability that the sample does not contain more than 1 defective?
(a)1/3 (b) 2/3
(c) 13/15 (d) 3/15

9. A bag contains 12 balls which are numbered from 1 to 12. If a ball is selected at random, what is the probability that the number of the ball will be a multiple of 5 or 6 ?
(a)0.30 (b) 0.25
(c) 0.20 (d) 1/3

10. If two unbiased dice are rolled, what is the probability of getting points neither 6 nor 9?
(a)0.25 (b) 0.50
(c).075 (d) 0.80

11. A number is selected at random from the first 1000 natural numbers. What is the probability that the number so selected would be a multiple of 7 or 11?
(a)0.25 (b) 0.32
(c)0.22 (d) 0.33

12. One number is chosen from numbers 1 to 200. Find the probability that it is divisible by 4 or 6?
(a) 67/200 (b) 89/200
(c) 56/200 (d) None

At least One event (independent Event)

13. A problem in probability was given to three CA students A, B and C whose chances of solving it are 1/3, 1/5 and 1/2 respectively. What is the probability that the problem would be solved?
(a) 4/15 (b) 7/8
(c)8/15 (d) 11/15

14. There are three persons aged 60, 65 and 70 years old. The survival probabilities for these three persons for another 5 years are 0.7, 0.4 and 0.2 respectively. What is the probability that at least two of them would survive another five years?
(a)0.425 (b) 0.456
(c)0.392 (d) 0.388

1. A bag contains 5 white, 7 red and 8 black balls. Four balls are drawn one by one with replacement, what is the probability that at least one is white?
(a) $1-(\frac{3}{4})^5$ (b) $1-(\frac{3}{4})^4$
(c) $1-(\frac{5}{4})^4$ (d) none

Conditional Probability

22. For a group of students, 30 %, 40% and 50% failed in Physics, Chemistry and at least one of the two subjects respectively. If an examinee is selected at random, what is the probability that he passed in Physics if it is known that he failed in Chemistry?
(a)1/2 (b) 1/3
(c)1/4 (d) 1/6

23. In a school, there are 1000 students, out of which 430 are girls. It is known that out of 430, 10% of the girls study in class XII. What is the probability that a student chosen randomly studies in class XII given that the chosen student is a girl?
(a)1/10 (b)1/13
(c)1/5 (d) 1/6

24. Ten cards numbered 1 through 10 are placed in a box, mixed up thoroughly and then one card is drawn randomly. If it is known that the number on the drawn card is more than 3, what is the probability that it is an even number?
(a)3/10 (b)6/13
(c)4/7 (d) 1/6

More than One Event

17. There are two boxes containing 5 white and 6 blue balls and 3 white and 7 blue balls respectively. If one of the boxes is selected at random and a ball is drawn from it, then the probability that the ball is blue is
(a)115/227 (b) 83/250
(c)137/220 (d) 127/250

18. A bag contains 8 red and 5 white balls. Two successive draws of 3 balls are made without replacement. The probability that the first draw will produce 3 white balls and the second 3 red balls is
(a) 5/223 (b) 6/257
(c)7/429 (d) 3/548

19. A class consists of 80 students; 25 of them are girls and 55 boys; 10 of them are rich and the remaining poor; 20 of them are fair complexioned. What is the probability of selecting a fair complexioned rich girl?
(a) 5/518 (b) 6/512
(c) 7/512 (d) 3/548

20. A police-man fires four bullets on a dacoit. The probability that the dacoit will be killed by one bullet is 0.6. What is the probability that the dacoit is still alive?
(a) 0.0256 (b) 0.8954
(c) 0.5623 (d) None

21. A bag contains 10 white and 15 black balls. Two balls are drawn in succession without replacement. What is the probability that first is white and second is black?
(a) 5/7 (b) 1/4
(c) 7/9 (d) 3/5

15. Find the probability of drawing a diamond card in each of the two consecutive draws from a well shuffled pack of cards, if the card drawn is not replaced after the first draw.
(a) 5/17 (b) 1/16
(c) 1/17 (d) 3/17

16. A bag contains 5 white, 7 red and 8 black balls. If four balls are drawn one by one without replacement, find the probability of getting all white balls.
(a) 5/969 (b) 6/969
(c) 7/969 (d) 1/969

Total Probability

25. There are two urns. The first urn contains 3 red and 5 white balls whereas the second urn contains 4 red and 6 white balls. A ball is taken at random from the first urn and is transferred to the second urn. Now another ball is selected at random from the second arm. The probability that the second ball would be red is
(a) 7/20 (b) 35/88
(c)17/52 (d) 3/20

26. There are two boxes containing 5 white and 6 blue balls and 3 white and 7 blue balls respectively. If one of the the boxes is selected at random and a ball is drawn from it, then the probability that the ball is blue is
(a)115/227 (b) 83/250
(c)137/220 (d) 127/250

Expected Value

27. If a random variable x assumes the values 0, 1 and 2 with probabilities 0.30, 0.50 and 0.20, then its expected value is
(a)1.50 (b) 3
(c)0.90 (d) 1

28. A packet of 10 electronic component is known to include 3 defectives. If 4 components are selected from the packet at random, what is the expected value of the number of defective?
(a)1.20 (b) 1.21
(c)1.69 (d) 1.72

Odds in Favour | Against

29. The odds in favour of A solving a problem is 5:7 and odds against B solving the same problem is 9:6. What is the probability that if both of them try, the problem will be solved?

(a) 117/180 (b) 181/200

(c) 147/180 (d) 119/180

Previous Year Questions

Level-1

June-2009

A bag contains 12 balls of which 3 are red 5 balls are drawn at random. Find the probability that in 5 balls 3 are red.
(a) 3/132 (b) 5/396
(c) 1/36 **(d) 1/22**

Dec-2009

In how many ways can the letters of 'REGULATION' be arranged so that the vowels come at odd places?
(a) 1/252 (b) 1/144
(c) 144/252 (d) None

Dec-2010

A dice is thrown once. What is the mathematical expectation of the number on the dice?
(a) 16/6 (b) 13/2
(c) 3.5 (d) 4.5

Dec-2010

A bag contains 3 white and 5 black balls and second bag contains 4 white and 2 black balls. If one ball is taken from each bag, the probability that both the balls are white is _____
(a) 1/3 **(b) 1/4**
(c) 1/2 (d) None

June-2011

A bag contains 5 Red balls, 4 Blue Balls and 'm' Green Balls. If the random probability of picking two green balls is 1/7. What is the no. of green Balls (m).
(a) 5 (b) 7
(c) 6 (d) None

Level-2

June-2011

The probability of Girl getting scholarship is 0.6 and the same probability for Boy is 0.8. Find the probability that at least one of the categories getting scholarship.
(a) 0.32 (b) 0.44
(c) 0.92 (d) None

June-2011

A coin is tossed 5 times, what is the probability that exactly 3 heads will occur.
(a) $\frac{5}{16}$ (b) $\frac{1}{32}$
(c) $\frac{5}{36}$ (d) $\frac{3}{32}$

Dec-2011

Two unbiased dice are thrown. The Expected value of the sum of numbers on the upper side is;
(a) 3.5 **(b) 7**
(c) 12 (d) 6

Dec-2011

Four married couples have gathered in a room. Two persons are selected at random amongst them, find the probability that selected persons are a gentleman and a lady but not a couple.
(a) 1/7 **(b) 3/7**
(c) 1/8 (d) 3/8

Dec-2011

One Card is drawn from pack of 52, what is the probability that it is a king or a queen?
(a) 11/13 **(b) 2/13** (c) 1/13 (d) None

Level-3

June-2012

Let A and B two events in a sample space S such that P(A) = $\frac{1}{2}$; P(B)= $\frac{5}{8}$, P(AUB) = $\frac{3}{4}$; Find P ($\overline{A}\cap\overline{B}$)
(a) 3/4 **(b) 1/4**
(c) 3/16 (d) None

June-2021

Which of the following pair of events E and F are mutually exclusive?

(a) E = {Ram's age is 13} and F = {Ram is studying in a college}

(b) E = {Sita studies in a school} and F = {Sita is a play back singer}

(c) E = {Raju is an elder brother in a family} and F = {Raju's father has more than one son}

(d) E = {Banu studied B.A. English literature and} F = (Banu can read English novels}

June-2021

Assume that the probability for rain on a day is 0.4. An umbrella salesman can earn Rs. 400 per day in case of rain on that day and will lose Rs. 100 per day if there is no rain The expected earnings in (in Rs.) per day of the salesman is
(a) 400 (b) 200 **(c) 100** (d) 0

Dec-2022

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?
(a) 0.934 (b) 0.864
(c) 0.85 **(d) .874**

Summary Notes

Theoretical Distribution

Binominal Distribution

1. What is the probability of making 3 correct guesses in 5 True- False answer type questions?
(a) 0.3125 **(c)** 0.6875
(b) 0.5676 **(d)** 0.4325

2. X is binomial variable with n = 20. What is the mean of X if it is known that x is symmetric?
(a) 5 **(c)** 2
(b) 10 **(d)** 8

3. If the overall percentage of success in an exam is 60, what is the probability that out of a group of 4 students, at least one has passed?
(a) 0.6525 **(c)** 0.8704
(b) 0.9744 **(d)** 0.0256

4. If x is binomial variate with parameter 15 and 1/3, what is the value of mode of the distribution?
(a) 5 and 6 **(c)** 5.50
(b) 5 **(d)** 6

5. What is the number of trials of a binomial distribution having mean and SD as 3 and 1.5 respectively?
(a) 2 **(c)** 8
(b) 4 **(d)** 12

6. For a Binomial distribution B (6, p), $P(x = 2) = 9p(x = 4)$, then P is
(a) 1/2 (b) 1/3
(c) 10/13 (d) 1/4

Poisson Distribution

7. If 1 percent of an airline's flight suffer a minor equipment failure in an aircraft, what is the probability that there will be exactly two such failures in the next 100 such flights?
(a) 0.50 **(c)** 0.265
(b) 0.184 **(d)** 0.256

8. If for a Poisson variable X, $f(2) = 3\,f(4)$, what is the variance of X?
(a) 2 **(c)** $\sqrt{2}$
(b) 4 **(d)** 3

9. If X ~ P (m) and its coefficient of variation is 50, what is the probability that X would assume only non-zero values?
(a) 0.018 **(c)** 0.989
(b) 0.982 **(d)** 0.976

10. If 1.5 per cent of items produced by a manufacturing unit are known to be defective, what is the probability that a sample of 200 items would contain no defective item?
(a) 0.05 **(c)** 0.20
(b) 0.15 **(d)** 0.22

11. A Company has two cars which it hires out during the day. The number of Cars demanded in a day has poison distribution with mean 1.5. Then percentage of days on which only one car was in demand is equal to
(a) 23.26 (b) 33.47
(c) 44.62 (d) 46.40

Normal Distribution

12. If the two quartiles of N (μ, σ^2) are 14.6 and 25.4 respectively, what is the standard deviation of the distribution?
(a) 9 **(c)** 10
(b) 6 (d) 8

13. If the mean deviation of a normal variable is 16, what is its quartile deviation?
(a) 10.00 **(c)** 15.00
(b) 13.50 **(d)** 12.05

14. If the points of inflexion of a normal curve are 40 and 60 respectively, then its mean deviation is
(a) 40 **(c)** 50
(b) 45 **(d)** 60

15. If the quartile deviation of a normal curve is 4.05, then its mean deviation is
(a) 5.26 **(c)** 4.24
(b) 6.24 **(d)** 4.80

16. If the Ist quartile and mean deviation about median of a normal distribution are 13.25 and 8 respectively, then the mode of the distribution is
(a) 20 **(c)** 15
(b) 10 **(d)** 12

17. The area under the Normal curve is
(a) 1 (b) 0
(c) 0.5 (d) – 1

18. If x ~ N (3,36) and y ~ N (5,64) are two independent Normal variate with their standard parameters of distribution, then if (x + y) ~ N (8,A) also follows normal distribution. The value of A will be _____.
(a) 100 (b) 10
(c) 64 (d) 36

19. What is the first quartile of x having the following probability density function?
$f(x) = \frac{1}{\sqrt{72\pi}} e^{-(x-10)^2/72}$ for $-\infty < x < \infty$
(a) 4 (b) 5
(c) 5.95 (d) 6.75

20. If the area of standard normal curve between z = 0 to z = 1 is 0.3412, then the value of ϕ (1) is.
(a) 0.5000 (b) 0.8413
(c) -0.5000 (d) 1

21. Area between = 1.96 to + 1.96 in a normal distribution is:
(a) 95.45% **(b) 95%**
(c) 96% (d) 99%

22. Area under U ± 3σ
(a) 99.73% (b) 99%
(c) 100% (d) 99.37%

23. For a certain type of mobile, the length of time between charges of the battery is normally distributed with a mean of 50 hours and a standard deviation of 15 hours. A person owns one of these mobiles and want to know the probability that the length of time will be between 50 and 70 hours is
(Given φ (1.33)) = 0.9082, φ (0) = 0.5)?
(a) -0.4082 (b) 0.5
(c) 0.4082 (d) -0.5

Previous Year Questions

Level-1

June-2009

For a Poisson distribution P (x = 3) = 5 P (x = 5), then S.D. is
(a) 4 (b) 2
(c) 16 **(d) $\sqrt{2}$**

June-2009

For a Poisson distribution P (x = 3) = 5 P (x = 5), then S.D. is
(a) 4 (b) 2
(c) 16 **(d) $\sqrt{2}$**

June-2011

If the inflexion points of a Normal Distribution are 6 and 14. Find its Standard Deviation?
(a) 4 (b) 6
(c) 10 (d) 12

June-2011

In a Binomial Distribution, if mean is k-times the variance, then the value of 'k' will be _____.
(a) p (b) $\frac{1}{p}$
(c) 1 – p **(d) $\frac{1}{1-p}$**

Dec-2011

The binomial distribution with mean 3 & variance 2 is:
(a) $\left(\frac{2}{4}+\frac{1}{4}\right)^{2\to9}$ (b) $\left(\frac{2}{6}+\frac{1}{6}\right)^{2\to9}$
(c) $\left(\frac{2}{3}+\frac{1}{3}\right)^{2\to9}$ (d) $\left(\frac{2}{5}+\frac{1}{5}\right)^{2\to9}$

Level-2

June-2012

If parameters of a binomial distribution are n and p then, this distribution tends to a Poisson distribution when
(a) $n \to \infty$. $p \to 0$ (b) $p \to 0$, $np = \lambda$
(c) $n \to \infty$, $np = \lambda$ **(d) $n \to \infty$, $p \to 0$, $np = \lambda$**

June-2013

In a binomial Distribution with 5 independent trials, probability of 2 and 3 successes are 0.4362 and 0.2181 respectively. Parameter 'p' of the binomial distribution is:
(a) 3/4 **(b) 1/3**
(c) 2/3 (d) 1/4

Dec-2013

In a certain Poisson frequency distribution, the probability corresponding to two successes is half the probability corresponding to three successes. The mean of the distribution is
(a) 6 (b) 12
(c) 3 (d) 2.45

June-2014

Mean and Variance of a binomial variance are 4 and $\frac{4}{3}$ respectively
then P (x >1) will be _____.
(a) $\frac{728}{729}$ (b) $\frac{1}{729}$
(c) $\frac{723}{729}$ (d) None

Level-3

June-2014

5,000 students were appeared in an examination. The mean of marks was 39.5 with a Standard Deviation 12.5 marks. Assuming the distribution to be normal, find the number of students recorded more than 60% marks.
Given: When Z = 1.64, Area of normal curve = 0.4495
(a) 1,000 (b) 505 **(c) 252** (d) 2,227

May-2018

If six coins are tossed simultaneously. The probability of obtaining exactly two heads are:
(a) 1/64 (b) 63/64 **(c) 15/64** (d) None

Nov-2018

If for a normal distribution $Q_1 = 54.52$ and $Q_3 = 78.86$, then the median of the distribution is
(a) 12.17 (b) 39.43 **(c) 66.69** (d) None

Nov-2018

If for a normal distribution $Q_1 = 54.52$ and $Q_3 = 78.86$, then the median of the distribution is
(a) 12.17 (b) 39.43 **(c) 66.69** (d) None

Nov-2018

The speeds of a number of bikes follow a normal distribution model with a mean of 83 km/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?
(a) 0.1003 (b) 0.38 (c) 0.49 (d) 0.278

Index No

Basic Problems

1. If the index number of prices at a place in 1994 is 250 with 1984 as base year, then the prices have increased on average by
(a)250% (b) 350%
(c)150% (d) none of these

2. If the prices of all commodities in a place have increased 125 times in comparison to the base period prices, then the index number of prices for the place is now
(a)100 (b) 225
(c)125 (d) none of these

3. If now the prices of all the commodities in a place have been decreased by 85% over the base period prices, then the index number of prices for the place is now (index number of prices of base period = 100)
(a)100 (b) 65
(c)135 (d) none of these

Miscellaneous Problems

4. If the prices of all commodities in a place have decreased 35% over the base period prices, then the index number of prices of that place is now
(a)35 (b) 65
(c)135 (d) none of these

5. If the prices of all commodities in a place have increased 1.25 times in comparison to the base period, the index number of prices of that place now is
(a)125 (b) 225
(c)150 (d) none of these

6. If $\sum p_o q_o = 1360, \sum p_n q_o = 1900, \sum p_o q_n = 1344, \sum p_n q_n = 1880$ then the Laspeyre's index number is
(a)0.71 (b) 1.75
(c)1.39 (d) none of these

7. The index number in whole sale prices is 152 for August 1999 compared to August 1998. During the year there is net increase in prices of whole sale commodities to the extent of
(a)45% (b) 52%
(c)35% (d) 48%

8. During a certain period, the cost-of-living index number goes up from 110 to 200 and the salary of a worker is also raised from Rs 330 to Rs 500. The worker does not get really gain. Then the real wages decreased by:
(a)Rs 45.45 (b) Rs 100
(c)Rs 43.25 (d) none of these

9. If the 2018 index with base 2015 is 250 and 2015 index with base 2012 is 150, the index 2018 on base 2012 will be:
(a) 800 (b) 375
(c)600 (d) None

10. Consumer price index number goes up from 110 to 200 and the salary of a worker is also raised from Rs 325 to Rs 500. Therefore, in real terms, to maintain his previous standard of living he should get an additional amount of:
(a)Rs 85 (b) Rs 98.25
(c)Rs 90.91 (d) none of these

Students are requested to Note Down the questions along with reference Book That are required to be revised along with the MIND-MAPS Multiple time Specially One Day Before Examination

Reference Book	Question Number	Remark

Number Series, Coding Decoding Odd Man Out

Number Series

1. 6, 11, 21, ? , 56, 81
(a) 42 **(b)** 36
(c) 91 **(d)** 51

2. 10, 18, 28, 40, 54, ?, 88
(a) 70 **(b)** 86
(c) 87 **(d)** 9

3. 120, 99, ?, 63, 48, 35
(a) 80 **(b)** 36
(c) 45 **(d)** 40

4. 22, 24, 28, 36, ? , 84
(a) 44 **(b)** 52
(c) 38 **(d)** 54

5. 48, 24, 96 , ?192
(a) 48 **(b)** 47
(c) 44 **(d)** 54

6. 165, 195, 255, 285, ?, 435
(a) 345 **(b)** 390
(c) 335 **(d)** 395

7. 6, 13, 28, 59, ?
(a) 122 **(b)** 114
(c) 113 **(d)** 112

8. 2, 7, 27, 107, 427, ?
(a) 1707 **(b)** 4027
(c) 4207 **(d)** 1207

Coding Decoding

9. In a certain language, MADRAS is coded NBESBT, how DELHI is coded in that code?
(a) EMMJI **(b)** EFMIJ
(c) EMFIJ **(d)** JIFEM

10. If RAMAN is written as 12325 and DINESH as 675489 how HAMAM is written?
(a) 92323 **(b)** 92233
(c) 93233 **(d)** 93292

11. If MEKLF is coded as 91782 and LLLJK as 88867, how can IHJED is coded as?
(a) 97854 **(b)** 64512
(c) 54310 **(d)** 75632

12. If DELHI is coded 73541 and CALCUTTA as 82589662, How can CALICUT be coded?
(a) 5279431 **(b)** 5978213
(c) 8251896 **(d)** 8543962

13. In a certain code, RIPPLE is written as 613382 and LIFE is written as 8192. How is PILLER written in that code?
(a) 318826 **(b)** 318286
(c) 618826 **(d)** 338816

Coding Decoding

14. 3, 5, 7, 15, 17, 19
(a) 15 **(b)** 17
(c) 19 **(d)** 7

15. 10, 14, 16, 18, 23, 24, 26
(a) 26 **(b)** 23
(c) 24 **(d)** 18

16. 1, 4, 9, 16, 24, 25, 36
(a) 9 **(b)** 24
(c) 25 **(d)** 36

17. 1, 5, 14, 30, 49, 55, 91
(a) 49 **(b)** 30
(c) 55 **(d)** 91

18. 835, 734, 642, 751, 853, 981, 532
(a) 751 **(b)** 853
(c) 981 **(d)** 532

19. Choose out the odd one of the following:
(a) December **(b)**February
(c) March **(d)** July

20. Choose out the odd one of the following:
(a) June **(b)** July
(c) Aug **(d)** Oct

21. Choose out the odd one of the following:
(a) Month **(b)** Week
(c) Fortnight **(d)** Season

22. Choose out the odd one of the following:
(a) Calendar **(b)** Year
(c) Date **(d)** Month

Students are requested to Note Down the questions along with reference Book That are required to be revised along with the MIND-MAPS Multiple time Specially One Day Before Examination

Reference Book	Question Number	Remark

Direction Sense Test

Decision on Final Position

1. Suresh starts from a point, walks 2 miles towards south, turns right and walks 1 ½ miles, turns left and walks V miles and then he turns back. What is the direction he is facing now?
(a) East **(b)**West
(c) South **(d)** North

2. Raju facing North and moves 20 km, then he turned to his right and moves 20 km and then he moves 10 km in North-East, then he turned to his right and moves 20 km and then he turned to his right and moves 20 km and again he turned to his left and moves 20 km. Now in which direction Rahu is facing?
(a) South-East **(b)** North-East
(c) South-West **(d)** North-West

3. A car travelling from south covers a distance of 8 km, then turns right and runs another 9 kms and again turns to the right and was stopped. Which direction does it face now?
(a) South **(b)**North
(c) West **(d)** East

4. Deepa starts walking north towards and after a while she turns to her right. After walking some distance, she turns to his left and walks a distance of 1 km. She then urns to her left again. In which direction she moving now?
(a) North **(b)** West
(c) East **(d)** South

Decision on Starting Position

8. Arun started from point A and walked 10 km East to point B, then turned to North and walked 3 km to point C and then turned West and walked 12 kms to point D, then again turned South and walked 3 kms to point E. In which direction is he from his straight point?
(a) East **(b)** South
(c) West **(d)** North

9. A man is facing East, then he turns left and goes 10 m, then turns right and goes 5 m then goes 5 m to the South and from there 5 m to West. In which direction is be from his original place?
(a) East **(b)** West
(c) North **(d)** South

10. Ashok went 8 km South and turned West and walked 3 km again he turned North and walked 5 kms. He took a final turn to East and walked 3 kms. In which direction was Ashok from the starting point?
(a) East **(b)** North
(c) West **(d)** South

11. A walk southwards, then turns right, then left and then right. In which direction is he from the starting point?
(a) South **(b)** East
(c) West **(d)** North

Misc.

12. Babu is Rahim's neighbor and his house is 200 meters away in the north-west direction. Joseph is Rahim's neighbor and his house is located 200 meters away in the south-west direction. Gopal is Joseph's neighbor and he stays 200 meters away in the south-east direction. Roy is Gopal's neighbor and his house is located 200 meters away in the north-east direction. Then where is the position of Roy's house in relation to Babu's?
(a) South-east **(b)** south-west
(c) North **(d)** North-east

13. If X stands on his head with his face towards south, to which direction will his left-hand point?
(a) East **(b)** West
(c) North **(d)** South

Shadow Concept

14. Daily in the morning the shadow of Gol Gumbaz falls on Bara Kaman and in the evening the shadow of Bara Kaman falls on Gol Gumbaz exactly. So in which direction is Gol Gumbaz to Bara Kaman?
(a) Easter side **(b)** Western side
(c) Northern side **(d)**Southern side

15. If Mohan sees the rising sun behind the temple and the setting sun behind the railway station from his house, what is the direction of the temple from the railway station?
(a) South **(b)** North
(c) East **(d)** West

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Reference Book	Question Number	Remark

Seating Arrangement

Linear Arrangement

1. There are five different houses, A to E, in a row. A is to the right of B and E is to the left of C and right of A, B is to the right of D. Which of the houses is in the middle? IB CA (IO) 2013)
(a) A **(b)** B
(c) C **(d)** D

2. Five friends P, Q, R, S and T are sitting in a row facing North. Here, S is between T and Q and Q is to the immediate left of R. P is to the immediate left of T. Who is in the middle? (SSC (Multi Task)2014)
(a) S **(b)** T
(c) Q **(d)** R

3. Five boys are standing in a row facing East. Pavan is left of Tavan, Vipin and Chavan to the left of Nakul. Chavan is between Tavan and Vipin. Vipin is fourth from the left, then how far is Tavan to the right? (CLAT 2014)
(a) First **(b)** Second
(c) Third **(d)** Fourth

4. In a gathering seven members are sitting in a row. 'C' is sitting left to 'B' but on the right to 'D'. 'A' is sitting right to 'B', 'F; is sitting right to 'E' but left to 'D'. 'H' is sitting left to 'E'. Find the person sitting in the middle (SSC (10+2) 2013)
(a) C **(b)** D
(c) E **(d)** F

Circular Arrangement

9. Siva, Satish, Amar and Praveen are playing cards. Amar is to the right of Satish who is to the right of Siva. Who is to the right of Amar?
(a) Satish **(b)**Amar **(c)** Praveen **(d)** Shiva

Directions (Q. No. 6- 9): Study the following information carefully to answer the given questions.

(a) P, Q, R, S, T, U, V and w are sitting round the circle and are facing the Centre.
(b) P is second to the right of T who is the neighbor of R and V
(c) S is not the neighbor of P
(d) V is the neighbor of U
(e) Q is not between S and W. W is not between U and S

10. Which two of the following are not neighbor?
(a) RV **(b)**UV **(c)** RP **(d)** QW

11. Who is immediate right to the V?
(a)P **(b)**U **(c)** R **(d)** T

12. Which of the following is correct?
(a) P is not the immediate right of Q.
(b) R is between U and V
(c) Q is to the immediate left of W
(d) U is between W and S

13. What is the position of S?
(a) Between U and V
(b) Second to right of P
(c) To the immediate right of W
(d) Data inadequate

Double Line Arrangement

Directions (Q. No. 25- 27): Study the following information carefully to answer the given questions.
Eight persons P to W are sitting in front of one another in two rows. Each row has four persons. P is between U and V and facing North. Q, who is to the immediate left of M is facing W. R is between T and M and W is to the immediate right of V. **(UCO Bank 2011)**

5. Who is sitting in front of R?
(a) U **(b)** Q
(c) V **(d) P**

6. Who is to the immediate right of R?
(a) M **(b) U**
(c) M or W **(d)** None

7. In which of the following pairs, persons are sitting in front of each other?
(a) MV **(b)** RV
(c) TV **(d)** UR

8. Four girls A, B, C, D are sitting around a circle facing the centre. B and C infront of each other, which of the following is definitely true? (MAT 2009)
(a) A and D Infront of each other
(b) A is not between B and C
(c) D is left of C
(d) A is left of C

Students are requested to Note Down the questions along with reference Book That are required to be revised along with the MIND-MAPS Multiple time Specially One Day Before Examination

Reference Book	Question Number	Remark

Blood Relation

Level-1

1. A reads a book and find the name of the author familiar. The author 'B' is the paternal uncle of C. C is the daughter of A. How is B related to A?
(a)Brother (b)Sister
(c) Father (d) Uncle

2. A is B's brother. C is A's mother. D is C's father. F is A's son. How is F related to D?
(a) Son
(b) Grandson
(c) Grand-grandson
(d) Grand-daughter

3. A is B's brother. C is A's mother. D is C's father. E is B's son. How is B related to D?
(a) Son (b)Grand-daughter
(c) Grandfather (d)Great grandfather

4. X and Y are the children of A. A is the father of X but Y is not his son. How is Y related to A?
(a) Sister (b)Brother
(c) Son (d) Daughter

5. A is B's brother. C is A's mother. D is C's father. E is B's son. How is E related to A?
(a)Cousin (b)Nephew
(c) Uncle (d) Grandson

Level-2

9. A and B are brother and sister respectively. C is A's father. D is C's sister and E is D's mother. How is B related to E?
(a) Grand-daughter
(b) Great grand-daughter
(c) Aunt
(d) Daughter

10. A and B are the young ones of C. If C is the mother of B but A is not the daughter of C, then what is the relationship between C and A?
(a) Nephew and Aunty
(b) Brother and Sister
(c) Mother and son
(d) Niece and Aunty

11. Seema is the daughter-in-law of Sudhir and sister-in-law of Ramesh. Mohan is the son of Sudhir and only brother of Ramesh. Find the relation between Seema and Mohan.
(a) Sister-in-law
(b) Aunt
(c) Cousin
(d) Wife

12. Pointing to a photograph Vikas said "She is the daughter of my grandfather's only son". How is the related to Vikas in the photograph?
(a) Father (b) Brother
(c) Sister (d) Mother

Level-3

6. 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 grand-daughter of the family?
(a) She is a lawyer
(b) She is an engineer
(c) She is a student
(d) She is a doctor

7. Sita is the niece of Ashok. Ashok's mother is Lakshmi. Kalyani is Lakshmi's mother. Kalyani's husband is Gopal. Parvathi is the mother-in-law of Gopal. How is Sita related to Gopal?
(a) Great grandson's daughter
(b) Gopal's Sita's father
(c) Sita is Gopal's great grand-daughter
(d) Grand niece

8. There are 2 film stars. One is the father of the other's son. What is the relationship of the two with each other?
(a)Grandfather and Grands
(b) Grandfather and son
(c) Husband and wife
(d) Father and Son

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Reference Book	Question Number	Remark