1. **What is Ratio?**

2. **Find simplest form of 3.50 : 8.75.**

3. **5:7 can also be written as :**

4.

Ratio	It's	Answer
5:7	Duplicate Ratio	
8:3	Triplicate Ratio	
11: 19	Inverse Ratio	
64:625	Sub-Duplicate Ratio	
125:27	Sub-Triplicate Ratio	

5. **Find compounded ratio of 5:7, a:b, x:y, 9:8**

6. **3 : 8 : 9 : 11 is a**

My Notes :

7. Ratio of 3 or more terms is known as

_____
_____

8. Ratio is unit free. _____

9. First term of the ratio = _____
Second term of the ratio = _____

10. Find the ratio of 3kg : 35,000 grams

_____

11. a:b can also be written as (ak : bk) or $\left(\frac{a}{k} : \frac{b}{k}\right)$ provided k ≠ 0 _____

12. The order of the terms in a ratio is important. _____

13. Find simplest form of $2\frac{1}{3} : 3\frac{2}{3}$

_____
_____

14.

In the Ratio	then a:b is called as
a:b If	
a > b	
a < b	
a = b	

15. Ratio exists only when 2 or more quantities are of same kind. _____

16. Find simplest form of $\frac{1}{3} : \frac{1}{8} : \frac{1}{10}$

_____
_____

17. Find simplest form of $\frac{3}{5} : \frac{2}{3} : \frac{8}{5}$

_____
_____
_____
_____

My Notes :

_____
_____
_____
_____
_____

18. Ratios are unit - free

19. If a:b = 2:3
b:c = 4:7
c:d = 8:1
Find a:b:c:d, a:d, b:d

20. If Quantity increase or decreases in the ratio a:b then new quantity = b of original quantity = a

$\therefore$ New quantity $= \left(\begin{array}{c} \text{original} \\ \text{quantity} \end{array} \times \begin{array}{c} \text{mutiplying} \\ \text{ratio} \end{array} \right)$

where multiplying ratio $= \left(\begin{array}{c} \text{Reciprocal of given} \\ \text{ratio} \end{array} \right)$

original quantity $= \left(\begin{array}{c} \text{new} \\ \text{quantity} \end{array} \times \begin{array}{c} \text{Given} \\ \text{ratio} \end{array} \right)$

21. Population of a city is x then it changes in the ratio of p:q then find new population

22. Inverse ratio of Inverse ratio of a:b is =
Duplicate ratio of sub duplicate ratio of p:q is =
Triplicate ratio of sub triplicate ratio of m:n is =
Sub triplicate ratio Triplicate ratio of x:y is =
Sub duplicate ratio of duplicate ratio of u:v =

23. Find Duplicate ratio of Inverse ratio of 5:7

24. Find Triplicate ratio of sub duplicate ratio of 25:49

My Notes :

25. Find compounded ratio of Duplicate ratio of 2:3, Triplicate ratio of 9:4, Sub duplicate ratio of 81:64, sub duplicate ratio of 512:27

26. When 4 quantities a,b,c,d are said to be in proportion?

27. When 4 quantities a,b,c,d are said to be in continued proportion?

28.

4 Quantities	Whether 4 Quantities are in	
	Continued Proportion?	Proportion?
2,6,18,54		
3,8,12,32		
8,24,96,288		
8,5,80,45		
4,6,9,13.50		

29. When 3 quantities a,b,c are said to be in proportion?

My Notes :

30. If a,b,c,d are in proportion i.e. $\dfrac{a}{b} = \dfrac{c}{d}$ then

Invertendo :

Alternendo :

Componendo :

Addendo :

Dividendo :

Subtrahendo :

Componendo and Dividendo :

31. If $\dfrac{a}{b} = \dfrac{c}{d} = \dfrac{e}{f} = \dfrac{g}{h} = \dfrac{i}{j} = k$, then

As per addendo k =

As per subtrahendo k =

32. If $\dfrac{a}{3} = \dfrac{b}{4} = \dfrac{c}{7}$ then, Find value of $\left(\dfrac{4a + 2b - 3c}{5b} \right)$

33. Find Fourth Proportional to 8, 12, 20

34. Find mean proportional to 9, 25

35.

4 Quantities in Proportion	Value of k = ?
8, 9, k, 63	
58, -3k, 28, 85	
36, 60, 2k, 98	
-3k, 86, 25, 63	

36. Rules of Indices

1. $a^m \times a^n =$

2. $\dfrac{a^m}{a^n} =$

3. $(a^m)^n =$

4. $a^{-m} =$

5. $(a.b)^m =$

6. $\left(\dfrac{a}{b}\right)^m =$

7. $a^{1/m} =$

8. $\left[(a^m)^n\right]^p =$

9. $(a^{m/n}) =$

10. If $a^x = a^y$; then

11. If $a^m = b^m$; then

37. $2x^{1/2} \times 3x^{-1} = ?$ If $x = 4$

38. $\dfrac{6ab^2c^3}{2a^2bc^8} =$

39. $\dfrac{64 \times \sqrt[3]{128}}{\sqrt[5]{512}} =$

40. $\left(\dfrac{4x^{-1}}{x^{-1/3}}\right) =$

41. $\dfrac{2a^{1/2} \times a^{2/3} \times a^{-7/3}}{9a^{-5/3} \times a^{3/2}} = ?$ If $a = 4$

42. $\dfrac{(a^m \times a^n \times a^p)}{a^x} =$ _____

43. $\sqrt[6]{a^{4b} \cdot x^6} \, (a^{2/3} \cdot x^{-1})^{-b} = \text{?}$ _____

44. $(\sqrt{9})^7 \times (\sqrt{3})^{-5} = 3^k$ then $k = \text{?}$

45. $\dfrac{2^5}{2^5} =$ _____

46. $\left(\dfrac{81x^4}{y^{-8}}\right)^{1/4} =$ _____

47. $\left\{\dfrac{(3^3)^2 \times (4^2)^3 \times (5^3)^2}{(3^2)^3 \times (4^3)^2 \times (5^2)^3}\right\} =$ _____

48. $y^{a-b} \cdot y^{b-c} \cdot y^{c-a} = \text{?}$

49. $\left[1 - \left\{1 - (1-x^2)^{-1}\right\}^{-1}\right]^{-1/2} =$ _____

My Notes :

50.

$$\left[(x^n)^{n-\frac{1}{n}}\right]^{\frac{1}{n+1}}$$

51. If $a^x = b$, $b^y = c$, $c^z = a$ then $xyz = ?$

52.

$$\left(\frac{x^a}{x^b}\right)^{(a^2+ab+b^2)} \cdot \left(\frac{x^b}{x^c}\right)^{(b^2+bc+c^2)} \cdot \left(\frac{x^c}{x^a}\right)^{(c^2+ac+a^2)} = ?$$

53. Log of number consist of 2 parts

Integer Part =

Fractional Part =

My Notes :

54. **Log x = characteristic of x + Mantissa of x**

$\text{Log}_b{}^a =$

$\text{Log}_m{}^{(ab)} =$

$\text{Log}_m{}^{(a/b)} =$

If $\log_b{}^a = k$; then

If $x^y = z$; then

$\text{Log}_{(a)}{}^{-b} =$

$\text{Log}\left(\dfrac{ab}{c}\right) =$

$A.\log(\log x) =$

$\text{Log}(A.\log x) =$

$\text{Log}_a{}^a =$

$\text{Log}_b{}^a \times \text{Log}_c{}^b =$

$\text{Log}_{10}{}^{10} =$

$\text{Log}_{10}{}^{100} =$

$\text{Log}_{10}{}^{1000} =$

$\text{Log}_m{}^{abc} =$

55. $\dfrac{\text{Log}_3 8}{\text{Log}_9 16 \times \text{Log}_4 10} =$

56. **Log x (where x > 0)**

Characteristic of x + **Mantissa of x**

If x ≥ 1

1 > x > 0

$\left(\text{No. of digits before decimal point} - 1\right)$

$\left(\text{No. of zeros immediately after decimal point} + 1\right)$ BAR
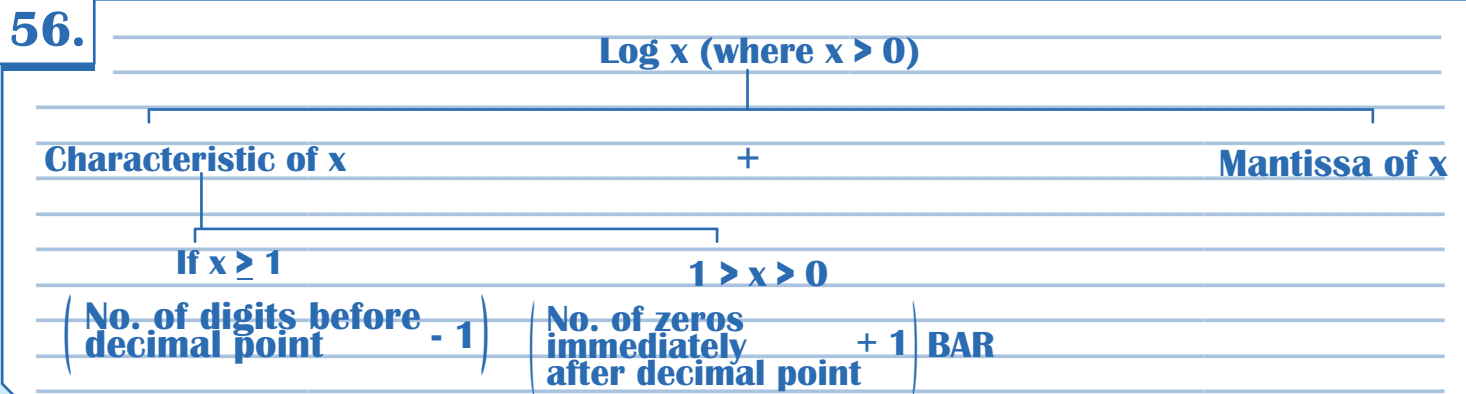
My Notes :

57.

X	Characteristic of x
56.81	
583.2	
81.93	
5.81	
13	
0.008126	
0.5826	
8.5926	

61.

Common base of Logs is :

Natural base of Logs is :

62. $Log_{\sqrt{2}} 64 =$

63. $Log_2 Log_2 Log_2 16 =$

64. $Log_9 (1/3) =$

65. $Log_{16} 32^{-8} =$

66. Log x = (m + n) ; Log y = (m - n); then

$$\text{Log}\left(\frac{10x}{y^2}\right) =$$

67. 2 Log 5 + Log 8 - (1/2) Log 4 =

68. $\sqrt[4]{729}$ x $\sqrt[3]{9^{-1}}$ x $27^{-4/3}$ = ?

69. $\text{Log}_{2\sqrt{2}} 64$ = ?

Time Value of Money

1.
Amount = Principle + Interest
Principle = Amount - Interest
Interest = Amount - Principle

2. Why is interest paid?

1. Time Value of Money
2. Opportunity Cost
3. Inflation
4. Liquidity Preference
5. Risk Factor

3.
Simple Interest =

Amount = P + Simple Interest
=

4.
Compound Interest =

Amount =

5. With Simple Interest

Amount Invested	Amount at the end of years						
	5	10	15	20	25	30	35
P	2P						
P	3P						

6. With Compound Interest

Amount Invested	Amount at the end of years					
	7	14	21	28	35	42
P	2P					
P	3P					
P	4P					

7. A = 50,00,000; r = 12% p.a.S.I; P = ?; n = 10 years

My Notes :

8. A = 50,50,000; r = 13.50% p.a.S.I; P = 20,00,000 ; n = _____ years

9. A = ?; r = 18% p.a.S.I; P = 25,000 ; n = 8 years 3 months

10. A sum of money doubles itself with compound interest in 10 years. How many times it will become after 40 years?

11. Find the future value of ₹ 50,000 after 25 years @ 22% p.a.C.I

12. Find present value of ₹ 20,00,000 receivable after 25 years if money is 18.50% effective.

13. A = ?; r = 14% p.a.C.Q; P = 20,00,000 ; n = 3 years 9 months

14. A = 80,00,000; r = 18.50% p.a.C.semiannually; P = ? ; n = 8 years 6 months

15.

Compounded	No. of conversion periods in a year
Annually	
Semi-annually	
Monthly	
Quarterly	
Weekly	
Daily	
Fortnightly	

16.

$A = P(1+r)^n$

A = Amount

P =

r =

n =

My Notes :

17. A = 2,00,000; r = 18% p.a.C.Q; P = 80,000 ; n = _____ years

18. A = 20,00,000; r = _____% p.a.C.Q ; P = 5,00,000 ; n = 8 years

19.

1.01^{35} = _____

1.1025^{38} = _____

1.10285^{45} = _____

1.1826^{90} = _____

20.

Discounting Factor =

Present Value = (Future Value x Discounting Factor)

How to find discounting factor on calculator?

21.

Simple Annuity is a series of payment / receipts where

22.

Effective rate of interest $= \left(1 + \dfrac{r}{n}\right)^{n} - 1$ **where** **r =**
n =

23.

Nominal Rate of Interest	Effective Rate of Interest
12% p.a.c.q	
14.50% p.a.c.m	
18% p.a.c.semiannually	
26.26% p.a.c.weekly	

24.

Effective Rate of Interest	Nominal Rate of Interest
18%	_____% p.a.c.q
20%	_____% p.a.c.monthly
28.56%	_____% p.a.c. half yearly

My Notes :

25.

a. Future Value of annuity regular =

b. Future Value of annuity due =

26.

Annuity Regular | Annuity Due / Immediate
↓ | ↓

27.

Present Value of Annuity Regular = (Periodical Amount x Annuity Factor)

28.

Present Value of Annuity Due = (Periodical Amount x Annuity Factor) x (1+r)

29. Mr. A invested ₹ 500 at the end of each year for 30 years. Find amount to be received at the end of 30 years, if money is 16% effective.

30. A person desires to create a sinking fund to be invested @12% p.a.c.l. by saving some amount at the end of each year for 30 years to buy house worth ₹ 30,00,000. Find amount to be saved at the end of each year.

Sequence & Series (AP-GP)

1.

Terms a, b, c, d, e, f, g are said to be in

AP, If	GP, If	HP, If

2.

Progression	AP/GP/HP/None of these
8, 16, 32, 64, 128	
80, 70, 60, 50, 40	
2, 8, 32, 128	
0.50, 0.25, 0.1666666, 0.125	
$\frac{1}{8}, \frac{1}{10}, \frac{1}{12}, \frac{1}{14}, \frac{1}{18}$	
100, 97, 94, 91	
4, 6, 9, 13.50	
10,80,150,220	
10,0,-10,-20,-30	

3.

For	t_n	S_n
AP		
GP		

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4. 80, 87, 94, 101, ... Find t_{30}, t_{80}, t_{125}, S_{45}, S_{100}, S_{125}

5. 5, 10, 20, 40, ... Find t_{12}, t_{10}, S_{16}, S_{22}

6. 1. Sum of infinite terms of G.P. where r > 1 =

2. Sum of infinite terms of G.P. where 0 < r < 1 =

7. 10 + 20 + 40 + 80 + ... ∞ terms = ?

8. 200 + 100 + 50 + 25 + ... ∞ terms = ?

9. For AP $t_5 = 80$, $t_{15} = 580$ Find a, d, t_{80}, t_{100}, S_{80}

10. For AP $t_3 = 15$, $S_3 = 30$
Find first term, common difference, S_{40}, S_{100}, t_{30}

My Notes :

11. For AP $t_n = (3n+5)$. Find S_n

12. For AP $t_n = ?$, if $S_n = (8n^2 - 3n)$ $t_n = ?$

13. For AP - Please Remember

1. If $S_m = S_n$, then S_{m+n} = zero
2. If $t_m = n$, and $t_n = m$, then t_{m+n} = zero
3. If $m \times t_m = n \times t_n$, then t_{m+n} = zero

14.

For 2 observations x,y

AM =   GM =   HM =

15.

For 2 observations relation between AM, GM, HM is

For any no. of observations relation between AM, GM, HM is

16. For 2 observations if GM = 10 and AM = 12, HM = ?

17. Insert 2 A.means between -200 and 1600

18. Insert 3 A.means between 5000 and 8520.

19. Insert one A.means between 100 and 250.

20. Insert 5 G.means between 500 and 8,000.

21.

a. Sum of first 'n' natural numbers =

b. Sum of first 'n' odd numbers =

c. Sum of squares of first 'n' natural numbers =

d. Sum of cubes of first 'n' natural numbers =

e. Sum of first 'n' even numbers =

22. $19^2 + 20^2 + 21^2 + 22^2 + \ldots\ldots\ldots + 105^2$

23. $28^3 + 29^3 + 30^3 + \ldots\ldots\ldots + 62^3$

24. $1 + 3 + 5 + 7 + \ldots\ldots\ldots\ldots + 989 = ?$

25. $4484 + 4488 + 4492 + \ldots\ldots\ldots + 16880 = ?$

26. n^{th} term of sequence 1, 3, 5, 7, ... is

27. $\sum_{i=4}^{i=7} \sqrt{2i-1}$ =

28. If $S_n = 2n^2 + 8n$, first 3 terms of AP are :

29. For AP $t_1 = -4$, $t_n = 146$, $S_n = 7171$. The number of terms is :

30. $3\frac{1}{2} + 7 + 10\frac{1}{2} + 14 + ...$ Find S_{17}

31. 4 A.means between -2 & 23 are

32. Find x such that 8x + 4, 6x - 2, 2x + 7, are in A.P

33. Find k such that (10k+8), (18k-19), (22k-81) are in A.P.

34. 4 A.means between -20 and 880 are

My Notes :

35. Insert 3 G.means between $\dfrac{1}{9}$ and 9.

36. $3 + 33 + 333 + \ldots\ldots\ldots$ n terms = ?

37. 6, 12, 24, 48, $\ldots\ldots\ldots$ Find t_{10}, S_{12}

38. For GP $t_2 = 24$, $t_5 = 81$ then find common ratio.

39. Sum of first 20 terms of G.P. is equal to 244 times of sum of first 10 terms of G.P. then common ratio = ?

40. $1 + 2 + 4 + 8 + \ldots\ldots\ldots = 8191.$
How many terms are there in the above G.P.?

41. 4 G.Means between 4 and 972 are :

42. For G.P., Find $t_4 = x$, $t_{10} = y$, $t_{16} = z$ then $y^2 = xz$. True / False

43. Find sum of all odd numbers divisible by 9 between 5,000 and 15,000.

44. Find sum of all numbers divisible by 7 between 800 and 8000.

45. $1.03 + 1.03^2 + 1.03^3 + \ldots\ldots\ldots\ldots$ Find S_{11}

46. For AP $t_m = n$, $t_n = m$ then $t_r = ?$

a. m+n+r   b. m+n-2r   c. (m+n+r)/2   d. m+n-r

My Notes :

Inequalities and Equations

1.

Locations	Points	Inequalities / Equations
1st Quadrant		
2nd Quadrant		
3rd Quadrant		
4th Quadrant		
X - Axis		
Y - Axis		
Origin		

2. The standard format of a linear equation is :

3. Graphical Presentation of a straight line is known as

4. Line is a set / collection of

5. Slope of the line $ax + by + c = 0$ is

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6.

Equation of line	Slope of Line
$8x + 3y = 93$	
$3x - 11y = 51$	
$-33x - 16y = -25$	
$3x = 83$	
$8y = 65$	
$px - qy = 80$	
$2x + 6063y = 81$	
$y = 8x + 13$	
$y = -15x + 65$	

7.

Equation of X-axis is : _____

Equation of Y-axis is : _____

Equation of || line to X-axis is : _____

Equation of || line to Y-axis is : _____

Slope of X-axis and all the lines || to X-axis is : _____

Slope of Y-axis and all the lines || to Y-axis is : _____

8. Equation of the line passing through points (x_1, y_1) and (x_2, y_2) is :

_____
_____
_____
_____

9. Slope of the line passing through points (x_1, y_1) and (x_2, y_2) is :

_____
_____
_____
_____

10. On solving 2 linear equations simultaneously if we get x=p and y=q, then

_____
_____
_____
_____
_____
_____
_____
_____

11.

Equation	Number of roots
Linear	
Quadratic	
Cubic	

12. $\dfrac{x + 4}{4} + \dfrac{x - 5}{3} = 11;$ x = ?

13. $\dfrac{y + 11}{6} - \dfrac{y + 1}{9} = \dfrac{y + 7}{4}$ then y = ?

14. $\dfrac{12x + 1}{4} = \dfrac{15x - 1}{5} + \dfrac{2x - 5}{3x - 1};$ then x = ?

15. <u>Standard format of a quadratic equation is :</u>

16. Find solution for $3x + 4y = 7$, $4x - y = 3$

17. $x + 5y = 36$, $\dfrac{x + y}{x - y} = \dfrac{5}{3}$; then $(x,y) = ?$

18. $\dfrac{3}{x + y} + \dfrac{2}{x - y} = 3$ & $\dfrac{2}{x + y} + \dfrac{3}{x - y} = 3\dfrac{2}{3}$; then $(x,y) = ?$

19. Monthly income of 2 persons is in the ratio of 4:5 and their monthly exp. are in the ratio of 7:9. If each saves ₹ 50 p.m. Find their monthly incomes.

20. Find the roots of $x^2 - 9x + 20 = 0$

21.

First root of quadratic equation =

2nd root of quadratic equation =

Sum of roots =

Product of roots =

22. Find roots of quadratic equation $3x^2 - 7x - 20 = 0$. Also find sum and product of roots.

23.

Quadratic Equations	Sum of roots	Product of roots
$3x^2 + 2x + 11 = 0$		
$5x^2 - 19x - 13 = 0$		
$2kx^2 - 13px + 8p - 19 = 0$		
$8x^2 - x - 63k + 25 = 0$		
$2x^2 = 25$		
$8x^2 - 13x = 0$		

24.

If $b^2 - 4ac =$	Nature of roots
zero	
Negative	
Positive (perfect square)	
Positive (not a perfect square)	

25.

$(a+b)^2 =$

$(a-b)^2 =$

$(a^2+b^2) =$

$(a+b)^3 =$

$(a-b)^3 =$

$(a^3+b^3) =$

$(a^2-b^2) =$

$(a+b+c)^2 =$

$a^3+b^3 =$

$(a-b)^2 =$

26. If α & β are roots of the quadratic equation $3x^2 + 7x + 12 = 0$, then

$\alpha\beta =$

$\alpha+\beta =$

$\alpha^2+\beta^2 =$

$\alpha^3+\beta^3 =$

$(\alpha-\beta)^2 =$

$\dfrac{\alpha}{\beta} + \dfrac{\beta}{\alpha} =$

$\dfrac{\alpha^2}{\beta} + \dfrac{\beta^2}{\alpha} =$

$\alpha^2\beta + \beta^2\alpha =$

27.

Value of $b^2 - 4ac =$	Nature of roots
28	
25	
-100	
0	
35	
64	
729	
-35	
-0	

28.

If roots of quadratic equation are	then
Equal	
Equal but opposite in sign	
Reciprocals of each other	

29. If α & β are roots of the quadratic equation $x^2 + 7x + 12 = 0$, then quadratic equation whose roots are $(α^2 + β^2)$ and $(α - β)^2$ is

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

30. Intercept form of Equation of Line is -

_____
_____
_____
_____
_____
_____
_____
_____

33. **Length of segment drawn between points (x_1, y_1) and (x_2, y_2) is**

34. **If m_1 is slope of one line and m_2 is slope of other lines then lines are said to be**

|| to each other if   **⊥ to each other, if**   **Oblique, if**

35. **The standard format of a quadratic equation is $ax^2 + bx + c = 0$, where $a \neq 0$ dividing by 'a' on both sides**

36. **Find quadratic equation whose roots are 5, 8.**

37.

equation	Quadratic Equation
8, 11	
-19, 16	
2, 20	
3/8, 5/8	
2/7, 5/2	
$(5 + \sqrt{3})$, $(5 - \sqrt{3})$	
$(8 + \sqrt{10})$, $(8 - \sqrt{10})$	

38.

For	Sum of roots	Product of roots
Quadratic Equation		
Cubic Equation		

39.
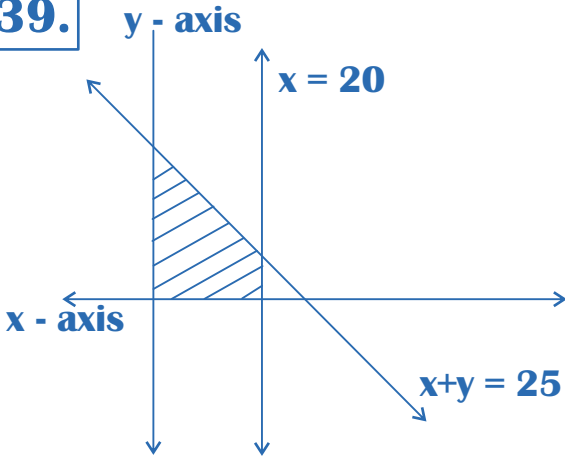
y - axis

x = 20

x - axis

x+y = 25

Inequalities representing shaded area are :

40.

y - axis

x = 30

y = 28

x - axis

Inequalities representing shaded area are :
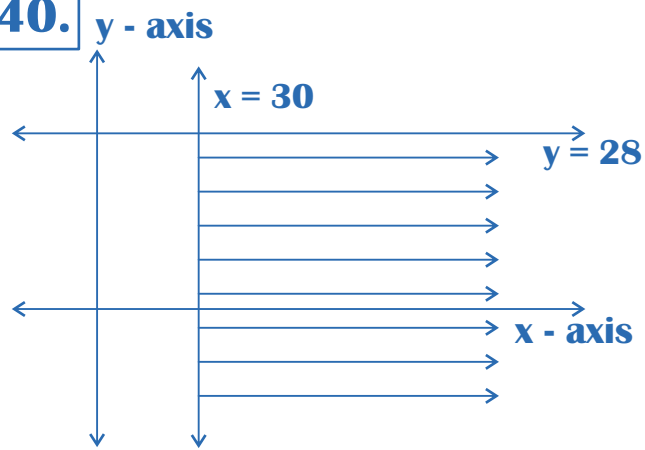
Permutations & Combinations

1.

Permutation =

Combination =

2.

0! =

1! =

2! =

3! =

4! =

5! =

6! =

7! =

8! =

9! =

10! =

11! =

12! =

a. $\dfrac{19!}{18!}$ =

b. $\dfrac{16!}{14!3!}$ =

c. $\dfrac{x!}{(x-1)!}$ =

d. $\dfrac{(x+3)!}{(x+2)!}$ =

e. $\dfrac{(x-3)!}{(x-1)!}$ =

3. In how many ways 3 students can stand in a line for a photograph?

4. In how many ways 4 students can stand in a line for a photograph?

5.

There are 5 students A, B, C, D, E in how many ways 2 of them can be

Selected   Arranged

6.

$$^nP_r = \frac{n!}{(n-r)!} \quad \text{where n = positive integer \& } n \geq r \geq 0$$

$^nP_r = n(n-1)(n-2) \dots\dots\dots r \text{ tems}$

$^nP_0 =$	$^{18}P_3 =$
$^nP_1 =$	$^{100}P_2 =$
$^nP_2 =$	$^{50}P_4 =$
$^nP_3 =$	$^{25}P_1 =$
$^nP_4 =$	$^{20}P_5 =$
$^nP_5 =$	$^{24}P_8 =$
$^nP_n =$	

7.

$$\frac{^{18}P_3 \times {}^{16}P_3}{^{19}P_4 \times {}^{17}P_2} =$$

8.

$$\frac{9!}{6!2!} \times {}^5P_2 =$$

9.

AND $\Longrightarrow$ Multiply

OR $\Longrightarrow$ Add

10. n! can also be written as

11. How many different words can be formed by using letters of word :

SQUARE :

HEXAGON :

MISSISSIPPI :

BOSTON :

MANAGEMENT :

PERMUTATION :

BANANA :

My Notes :

12. How many different words can be formed by using letters of word [   ]
if all vowels should be kept together.

BANANA :

PERCEPTION :

JAYARAMAN :

STATISTICS :

COMPUTER :

CALCULATOR :

TATED :

13. In how many ways 'n' students can stand in a line for a photograph if r of them

Want to be
always together?

Want to be
never together?

14.

In how many ways 3 letter words can be formed by using letters of the word

SQUARE   HEXAGON   COMPUTER

15.

In how many ways 12 students can stand in a line for a photograph if

2 of the want to be   2 of them want to be
always together?   never together?

16. If $6 \times {}^{n}P_3 = 7 \times {}^{(n-1)}P_3$. Find n.

17. If ${}^{n}P_4 = 12 \times {}^{n}P_2$. then n = ?

18. ${}^{n}P_3 : {}^{n}P_2 = 3:1$; then n = ?

19. $^5P_r = 60$; then $r = ?$

20. The no. of ways in which letters of word 'TRIANGLE' can be arranged if word 'ANGLE' is always present.

21. In how many ways 5 students can form a

Line   Circle
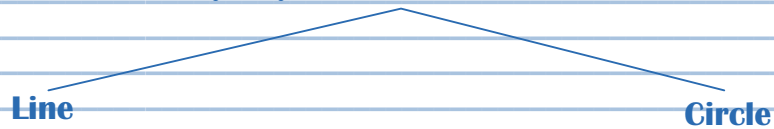
22. In how many different ways 12 students can form a

Line   Circle
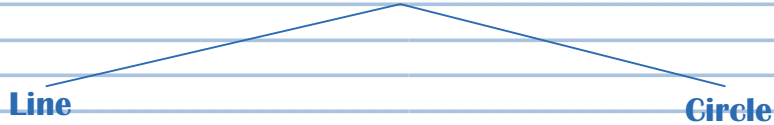
23. In how many ways _____ of 7 students can be formed out of 12 students

Line   Circle
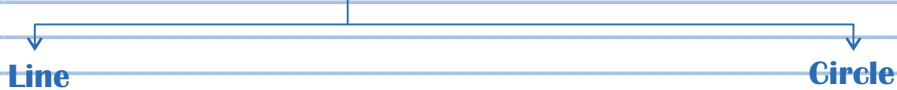
In how many ways 'r' students can be formed out of 'n' students can form

Line   Circle

24. The no. of ways in which 'n' diamonds can form a necklace.

25. The number of ways of arranging 'n' persons along a round table so that no person has the same 2 neighbours

26. No. of different necklaces can be formed with 'n' beads of different colours = ?

27. Permutation of 'n' distinct things taken 'r' at a time when a particular object is

Always there?   Never there?

28. How many 4 digit numbers can be formed by using 0,1,2,3,4,5 if repetition of digits is

Allowed   Not allowed

My Notes :

29. How many even numbers of 5 digits can be formed by using 2,3,4,5,6,7,8 if repetition of digits is

Not allowed   Allowed

30. How many 5 digit numbers greater than 23,000 can be formed by using 1,2,3,5,8,9

31. How many 4 digit numbers greater than 4700 can be formed by using 2,3,4,5,8 if repetition of digits is

Allowed   Not allowed

32. $^{n}C_{r} =$

My Notes :

33. Formulae on combinations

$^{n}C_{r} =$

$^{n}C_{3} =$

$^{n}C_{r} =$

$^{n}C_{4} =$

$^{n}C_{0} =$

$^{n}C_{n} =$

$^{n}C_{1} =$

$^{n}C_{n-r} =$

$^{n}C_{2} =$

$^{n}C_{r} + ^{n}C_{r-1} =$

$^{n}C_{0} + ^{n}C_{1} + ^{n}C_{2} + \dots\dots + ^{n}C_{n} =$

$^{n}C_{1} + ^{n}C_{2} + ^{n}C_{3} + \dots\dots + ^{n}C_{n} =$

34. $^{45}C_{x} = ^{45}C_{y}$ then

35. $^{15}C_{11} =$

$^{15}C_{4} =$

36. $\dfrac{^{n}P_{r}}{^{n-1}P_{r-1}} =$

37. In how many ways 52 cards can be equally divided in 4 groups?

38. In how many different ways 10 mangoes can be divided among 3 people such that they will get 2,3,5 mangoes

39.

$$\frac{^nP_r}{^nC_r} =$$

$$^5P_r =$$

$$^5C_r =$$

$$\frac{^nC_r}{^nP_r} =$$

$$\therefore \frac{^5P_r}{^5C_r} =$$

40.

$$P(8, 3) =$$

$$C(12, 4) =$$

41.

$$\frac{^{18}P_3 \times {}^{17}C_2}{^{19}P_2 \times {}^{18}C_2} =$$

My Notes :

42. $\dfrac{^{20}P_3 \times {}^{21}P_4 \times {}^{22}C_4}{^{23}C_3 \times {}^{22}P_3 \times {}^{21}P_2} =$

43. In a party of x people if everyone hand shakes with other. How many handshakes will take place

44. How many diagonals can be drawn in a polygon having :

7 sides

8 sides

10 sides

45. In a group of 100 people, if everyone sends a greeting to other, How many cards will be used in total?

46. In a plane of 20 non-collinear points

How many different straight lines can be drawn?

How many different triangles can be obtained?
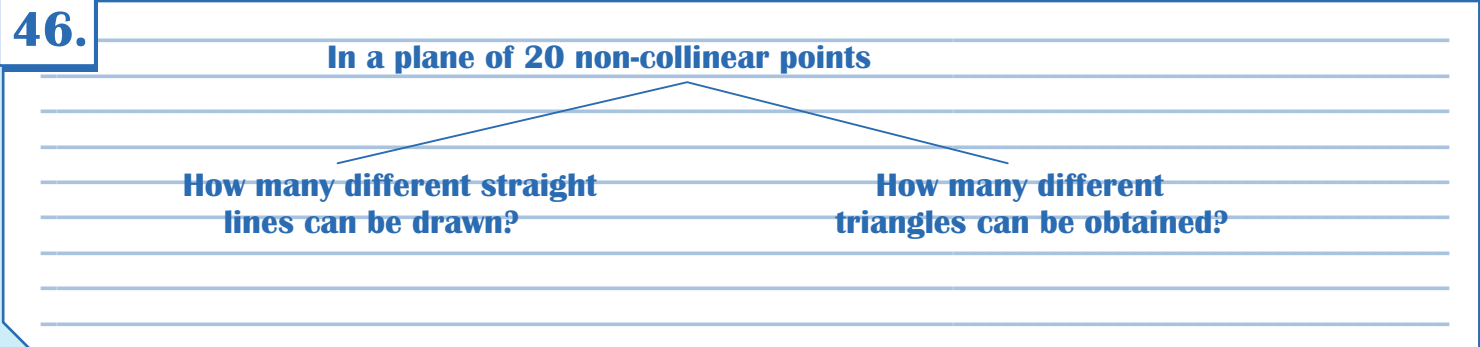
47.

In a plane there are 30 points out of which 8 are collinear

How many different straight lines can be drawn?

How many different triangles can be obtained?

48. There are 4 parallel lines intersecting with another set of 5 parallel lines. How many parallelograms can be drawn?

49.

8 Red; 3 Pink; 6 White Balls -

How many different selections of 3 balls are possible with

All Red balls   2 Red balls   Atleast 2 white balls   No pink balls

50.

4 CA's; 3 Engineers; 8 Doctors -

How many ways a commitee of 4 members can be formed with

Atleast 1 doctor   Atleast 1 person of each profession

51.

There are 8 males & 11 females. In how many ways a committee of 5 members can be formed with

No restriction   Atleast 4 Females   Atmost 1 Female   3 Females

52.

$$^nP_r = {}^{n-1}P_r + r \cdot {}^{n-1}P_{r-1}$$

a. True   b. False

53.

A supreme court bench consist of 7 judges. In how many ways majority decision can be taken?

54.

A question paper has 8 questions. In how many ways atleast one question can be solved?

55. A question paper has 8 questions (each one has alternatives). In how many ways one or more questions can be solved?

56. No. of ways in which 9 things can be divided in 3 groups containing 2,3,4 things respectively.

57. Number of odd numbers greater than 500 can be formed by using 3, 1, 2, 8

58. In a paper there are 2 sections A, B containing 5, 8 questions respectively. In how many ways total 5 questions can be solved with atmost 3 questions of any one of the section.

59.

A man has 12 friends in how many ways he can invite _____ for dinner

| 2 of them | Atleast 10 of them | 5 of them | Atleast one of them | Atmost 10 of them |

Sets, Functions, Relations

1.

Set is a collection of _____ and _____ objects

Roster Form / Braces Form

Algebric Form / Rule Form / Property Form / Set Builder Form

A = {1,2,3,4,5,6,7,8,9,10}

A is a set of first 10 natural numbers

OR

A = {x : where x ∈ N and x ≤ 10}

2.

In mathematics everything in this world whether living or non-living, is called as an

3. A = {5,8,9,10,13}   Explain : ∈

4. No. of distinct elements of a set is known as

5. Types of sets on the basis of elements

6.

Generally name of the set

Order of object is

Repetition is of no use

A = {1,2,3,4,5}   B = {5,4,4,5,1,2,2,3,4,5,4}

sets A and B are name sets

7. Equivalent sets :

8. Subset :

9. Superset :

10. Proper Subset :

11. Improper Subset :

12. Find all possible subsets of A = {5,7,8}

13. For set B = {a,b,c}

All possible subsets :

All possible proper subsets :

All possible improper subsets :

All possible empty subsets :

All possible non-empty subsets :

14. If cardinal value of a set = n; then

No. of subsets :

No. of proper subsets :

No. of improper subsets :

No. of empty subsets :

No. of non-empty subsets :

No. of non-empty proper subsets :

15. When 2 sets are said to be equivalent sets?

16. When 2 or more sets are said to be equal sets?

∴ All equal sets are equivalent but all equivalent sets are not necessarily equal sets.

17. Universal Set :

18. Complementary Set :

My Notes :

19.

If A = {1,2,3,4} B = {2,4,8,10} U = {1,2,3,4,5,6,7,8,9,10}

Find A' =

B' =

(A ∪ B) =

(A ∩ B) =

20.

Find Set A

A

B

21.

Find Set A'

A

B

22.

Find Set B

A

B

23.

Find Set B'

A
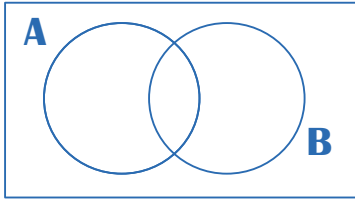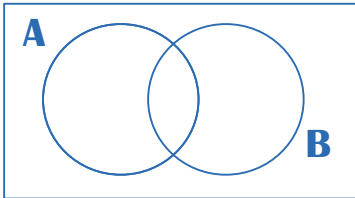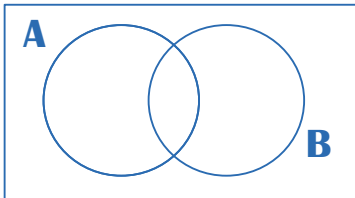
B
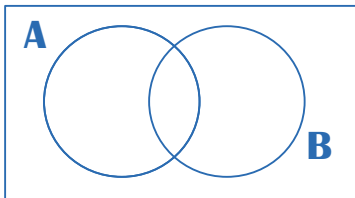
My Notes :

24.

Find Set (A ∪ B)
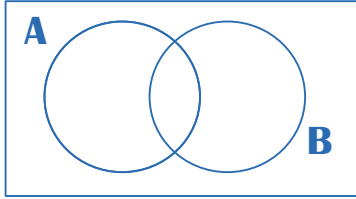
25.

Find Set (A ∩ B)
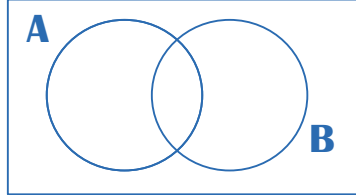
26.

Find (A-B) = (A ∩ B′)
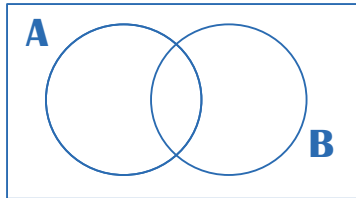
27.

Find (B-A) = (B ∩ A′)
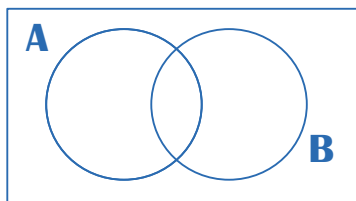
28

Find (A ∪ B′)
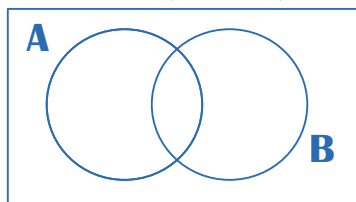
29

Find (B ∪ A′)

30.

Find (A′ ∩ B′)

A

B

31.

Find Set (A′ ∪ B′)

A

B

32.

Find Set (A △ B)

A

B

33.

Find (A ∪ B ∪ C)

A

B

34.

A   B

5   2   8

10

6   3

18

C
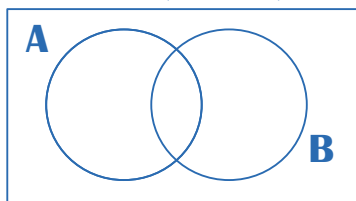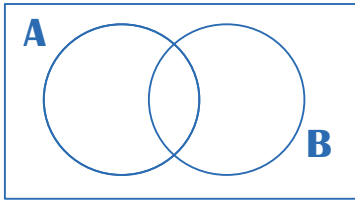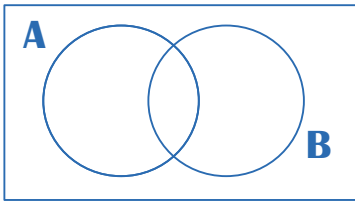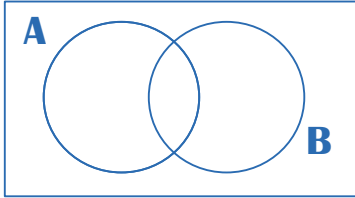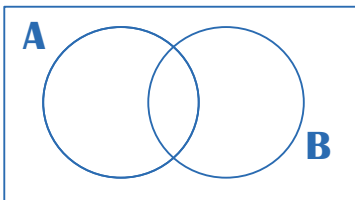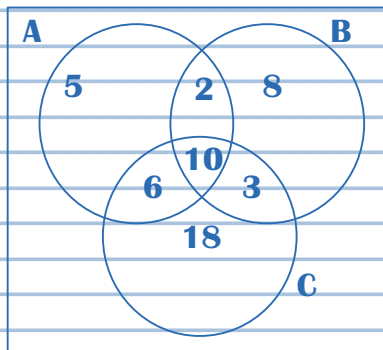
n(A ∪ B ∪ C) =

n(A) + n(B) + n(C) - n (A∩ B) - n(B∩C) - n(A ∩C) + n(A∩B∩C) =

35.

A   B   Find A = {   }

1,10 3,9 2,4,5   Find B = {   }
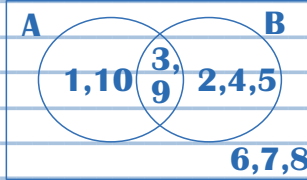
6,7,8   Find A$'$ = {   }

Find B$'$ = {   }

Find A $\cup$ B =	Find A $\cup$ B$'$ =
Find A $\cap$ B =	Find A$'$ $\cap$ B$'$ =
Find A - B =	Find A$'$ $\cup$ B$'$ =
Find B - A =	Find B $\cup$ A$'$ =

36.

Formulae of sets at one place

n(A$'$) =	n(A$'$ $\cap$ B$'$) =
n(B$'$) =	n(A $\triangle$ B) =
n(A$\cup$B) =	n(A$'$ $\cup$ B$'$) =
n(A$\cap$B) =	n(A $\cup$ B$'$) =
n(A - B) =	n(B $\cup$ A$'$) =
n(B - A) =	

37.

If A = {1,2,3} B = {8,9}

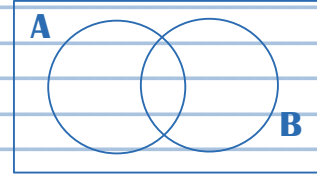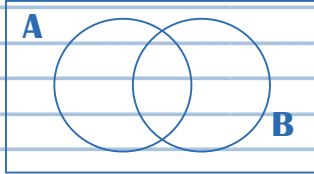**Find (A x B) =**

Find (B x A) =

38.

A is a subset of B : Notation :

A is a proper subset of B : Notation :

39. Demorgan's Rules of Sets

A

B

A

B

40.

$A \cup A =$

$A \cap A =$

$A \cup \phi =$

$A \cap \phi =$

$A \cup A' =$

$A \cap A' =$

$A \cup U =$

$\phi' =$

$A \cup (A \cup B) =$

$(A \cup B) \cup (A \cap B) =$

$(A \cup B) \cup (A' \cap B') =$

$A \cup (A \triangle B) =$

$A \cup (A \cap B') =$

$(A \cap B') \cup (A \cap B) =$

$(A \triangle B) \cup (A \cap B) =$

$U' =$

41.

Any subject of the product set X.Y is said to define a relation from X to Y, and any relation from X to Y in which no 2 different ordered pairs have the same first element is called as function.

In $f : A \longrightarrow B$

the element f(x) of B is called as image of x while x is called as pre-image of f(x).

42. There are 4 types of relations

1.

2.

3.

4.

43. If $f(x) = 3x^2 + 2x + 1$

Find $f(3)$, $f(8)$, $f(-9)$, $f(10)$

44. If $f(x) = 8x + 11$; $g(x) = 2x + 9$

Find

$f(3) =$

$g(8) =$

$g(p) =$

$f(-13) =$

$f(20) =$

45. If $f(x) = 10x + 15$; $g(x) = 7x - 13$ Find $f.g(x)$, $g.f(x)$

46. If f(x) = 2x+11   Find $f^{-1}(y)$, $f^{-1}(x)$, $f^{-1}(p)$

47. If f(x) = $\frac{1}{1-x}$; Find f(10), f(2), f(13), f(p)

48. When a relation is said to be

Symmetric

Reflexive

Transitive

49. Relation of Equivalence

50. 'Is perpendicular to' is a

My Notes :

51. 'Is the reciprocal of' is a

52. If f(2x+3) = 8x + 7. Find f(x), f(30)

53. Domain and Range of {(1,5),(2,8),(3,9),(4,18)}

54. f(x-1) = x^2. Find f(x), f(x+1)

55. In a class of 100 students 60 like maths 50 like physics 25 like both subjects. Find how many students :

a. Like maths or physics

b. Like maths but not physics

c. Like physics but not maths

d. Neither like maths nor like physics

e. Not like atleast one of 2 subjects

f. Like one and only one subject

Statistical Description of Data

1. The word statistics is derived from :

- Latin word Status
- Italian word Statista
- German word Statistik
- French word Statistique

2. We may define statistics in singular and plural sense

3. Statistics is useful in -

4. 5 Steps in Statistics -

5.

Collection of Data

6. Following methods can be used for collection of primary data

1. Questionnaire Method
2. Mailed questionnaire Method
3. Interview Method
4. Observation Method

My Notes :

7. **Sources of Secondary Method**

1. International sources WHO, IMF, World Bank, etc.

2. Govt. Sources

3. Private Sources

4. Unpublished Data

8. Checking the data for it _____ and _____ is known as scrutiny of data

9. **Methods of Classification of Data**

1.

2.

3.

4.

5.

10. **Methods of Presentation of Data**

1.

2.

3.

11. | Table No. 678 | **Course wise No. of students at PERCEPT (Year 2022)**

Course \ Students	Boys	Girls	Total
CA Foundation			
CA Inter			
CA Final			

12. The best method of data presentation is

13. The most attractive method of data presentation is

14. Stubs are :

15. Captions are :

16. Diagrammatic Presentation

Line Diagrams   Bar Diagrams   Pie Chart
OR
Histograms
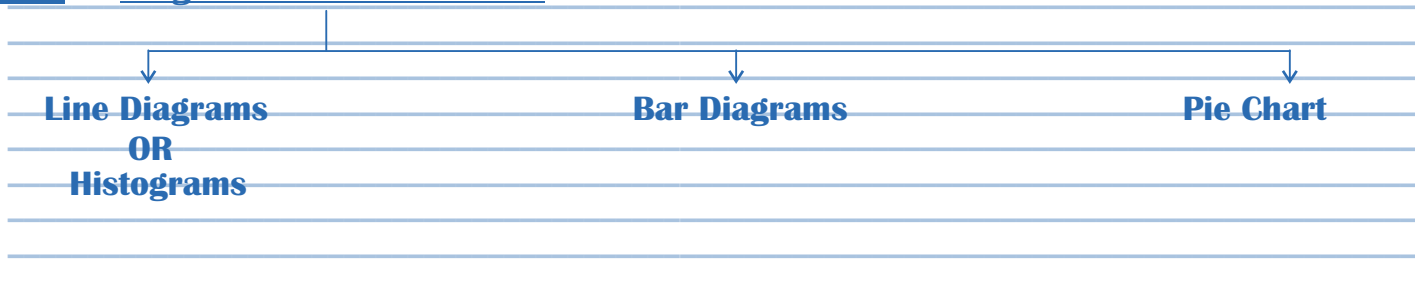
17. Simple data on marks of 25 students :
6, 3, 8, 11, 19, 23, 24, 18, 11, 13, 16, 15, 19, 11, 20, 16, 8, 9, 2, 3, 5, 4, 9, 2, 13

C.I.	
0-5	
5-10	
10-15	
15-20	
20-25	

18.

LCB =

UCB =

Relative Frequency =

Percentage Frequency =

Class Width =

Class-mark =

Frequency Density =

Less than type of cumulative frequency =

Greater than type of cumulative frequency =

19.

C.I.	Freq.	LCL	UCL	LCB	UCB	Relative Freq.	% Freq.	Freq. Density	Class Mark	Class Width	less than type c.f.	greater than type c.f.
10-20	5											
20-60	8											
60-80	7											
80-100	20											
100-120	3											
120-140	7											

20.

Graphical Presentation

Area Diagrams OR Histograms   **Frequency Polygon**   **Cumulative frequency curves OR Ogives**

My Notes :

_____
_____
_____
_____
_____
_____

21.

Median can be

Mode can be

22.

Frequency Curves

1. **Bell shaped curve**
2. **U-shaped curve**
3. **J-shaped curve**
4. **Mixed curve**

23.

Data

24.

Discrete Variable :

Continuous Variable :

25.

Definition of Statistics

Plural sense

Singular sense

Quantitative and qualitative data collected usually with a view of having statistical analysis

Scientific method that is employed for collecting, analysing and presenting data leading finally to drawing statistical interferences.

My Notes :

26.

Limitation of Statistics

a. Deals with aggregate, an individual has no statistical significance.
b. Mostly concerned with quantitative data
c. Based on assumptions, so projections are likely to be inaccurate
d. Based on random sampling.

27. Methods of Collection of primary data

Interview Method	Mailed Questionnaire Method	Observation Method	Questionnaire filled and sent by enumeraters
a. Personal interview			
b. Indirect interview			
c. Telephonic interview			

28.

a. In personal interview investigator meets to the respondent directly and collects the information.

b. If there are some practical problems in reaching the respondents directly then we may go for indirect interview when investigator collects the information from the persons associated with the problem.

c. Telephonic interview is quick and non expensive method to collect primary data.

First 2 methods are inapplicable when there is large data. The amount of non-response is maximum for third method of data collection.

29. Scrutiny of Data :

Since statistical analysis are made only on the basis of data, it is necessary to check whether the data under consideration are accurate and consistent.

No hard and fast rules can be applied for scrutiny of data. One must apply his intelligence, patience and experience while scrutinising the given information.

30.

Textual Presentation :
This method comprises presenting data with the help of paragraphs.
Advantage of this method lies in its simplicity, a layman can also present data under this method.
Textual presentation, however not preferred as it is Dull, Monotonous, Lengthy.

31.

Tabular Presentation :
It may be defined as systematic presentation of data with the help of a statistical table having no. of rows, columns and complete ref. no., title, description of rows and columns, foot notes, if any.
a. Caption is the upper part of the table describing column and sub-columns.
b. Stubs are left part of table providing description of rows.
c. Body is the main part of the table that contains numerical figures.

32. Diagrammatic Presentation of Data

a. Another alternative and attractive method is with the help of charts, graphs, pictures, etc.

b. Any hidden trend can be understood with the help of this method.

c. However, as compared to tabulation, this method is less accurate. So if priority is accuracy of data, we have to recommend tabulation.

33.

We are going to consider the following types of diagrams

a. Line diagram / histogram

b. Bar diagram

c. Pie chart / pie diagram / circle diagram.

34.

- Line diagram that uses logs is known as Ratio-chart.

- Multiple Line chart is used for representing 2 or more related time series data expressed in same unit.

- Multiple Axis chart in somewhat similar situations if variables are expressed in different units.

35.

- Horizontal bar diagram issued for qualitative data.

- Vertical bar diagram is associated with quatitative data OR time series data

36.

LINE-CHART

VERTICAL BAR-CHART

37.

MULTIPLE BAR-CHART
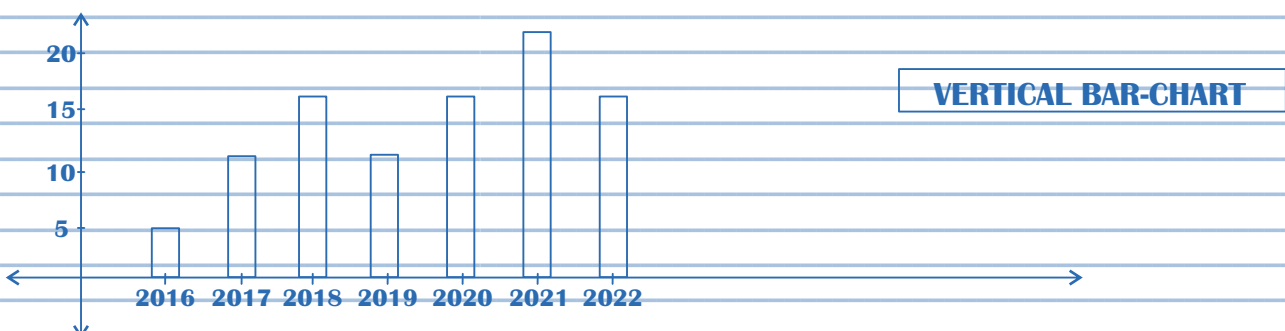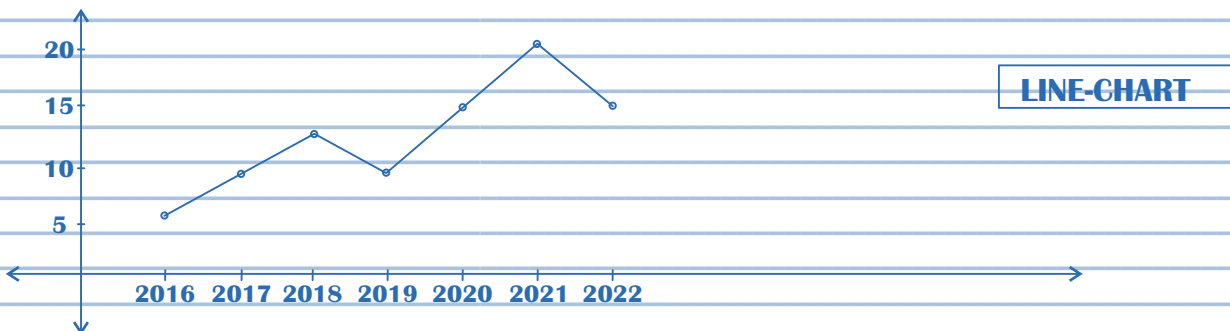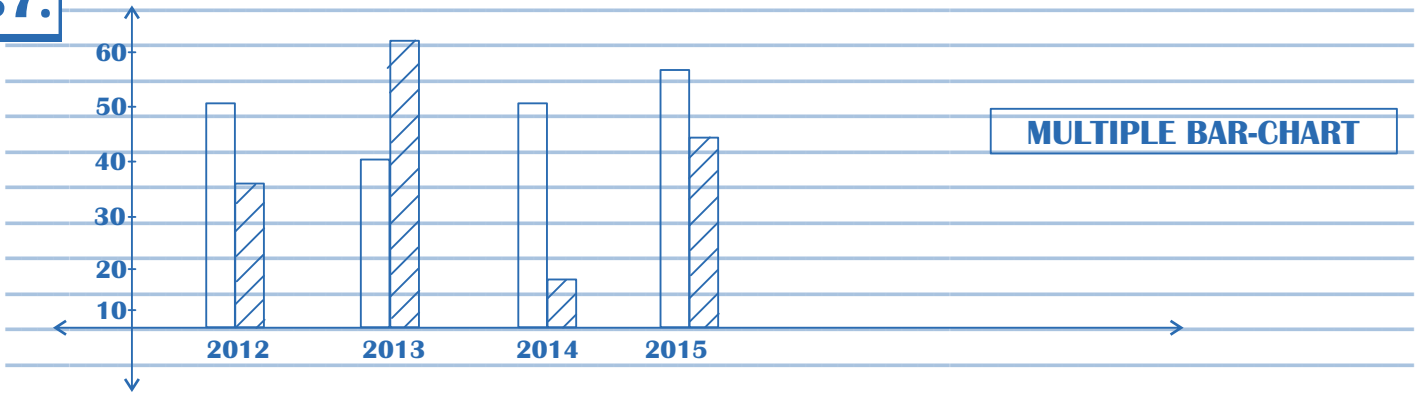
38. Draw the appropriate diagram for presentation the of following data :

Source	Revenue in Millions (₹)
Customs	80
Excise	190
Income-Tax	160
Corporate Tax	75
Misc	35
Total	540

⟹

Source	Angle in Pie chart
Customs	(80/540) x 360 = 53° (approx.)
Excise	(190/540) x 360 = 127°
Income-Tax	(160/540) x 360 = 107°
Corporate Tax	(75/540) x 360 = 50°
Misc	(35/540) x 360 = 23°

Customs
Excise
Income-Tax
Corporate Tax
Misc
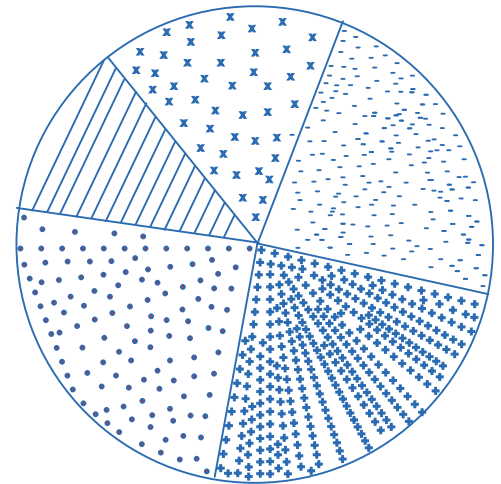
39.

Graphical Presentation of Frequency Distribution

| Area Diagrams OR Histograms | Frequency Polygon | Cumulative frequency curves OR Ogives |

40.

Histogram

Mode of data
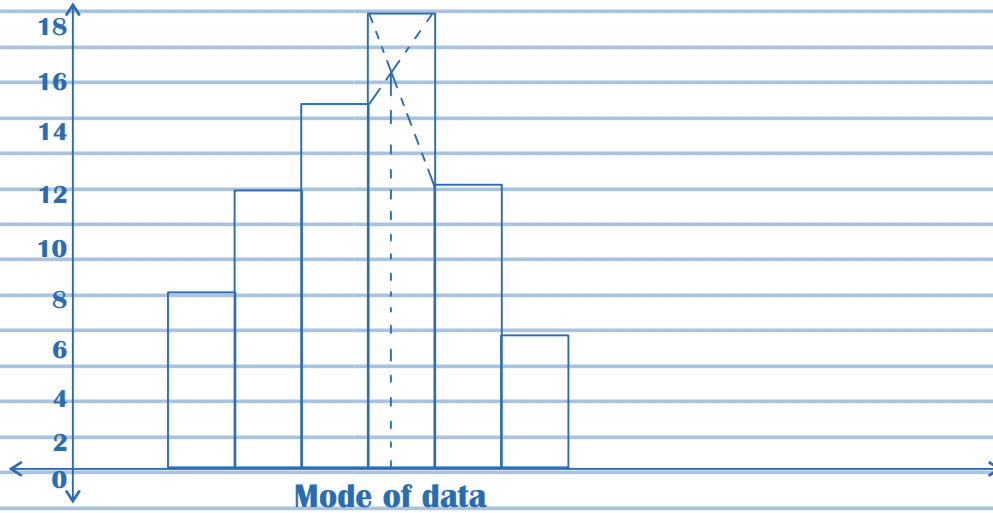
41.

Frequency Polygon

Mid-points	46	51	56	61	66	71
No. of student	3	4	5	7	9	8
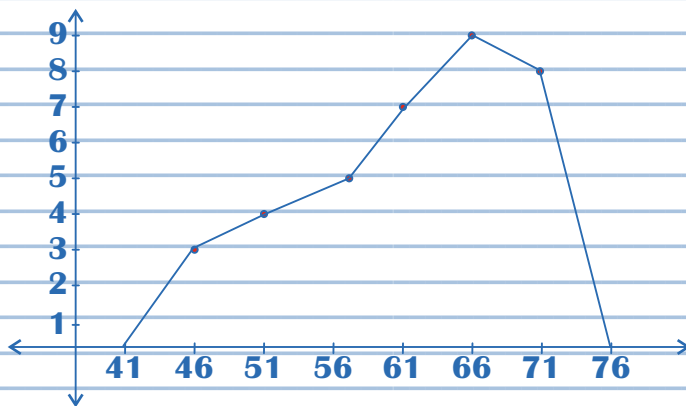
42.

Ogives OR Cumulative frequency curves

**Less than type
of cumulative frequency curve**

**More than type
of cumulative frequency curve**

Median

4   8   12   16   20   24   28
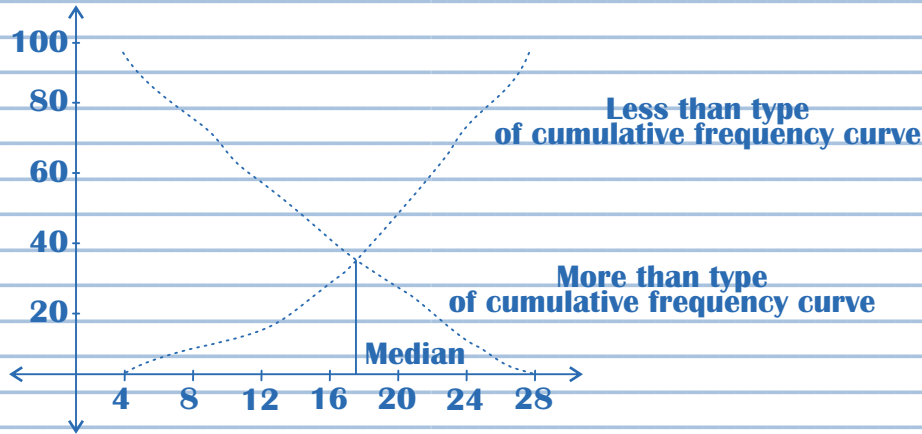
Median can be graphically obtained with the help of cumulative frequency curves / ogives

Mode can be graphically obtained with the help of histogram.

43. **There are 4 types of frequency curves**

Bell shaped curve	U shaped curve	J shaped curve	Mixed curve
Distribution of height, weight income generally belong this category. Freq. distribution starts with low becomes maximum at centre then gradually reaches to lowest value to other extremity.	Frequency distribution is minimum near the central part and freq. slowly and steadily reaches maximum at after two extremities.	It starts with the minimum frequency and then gradually reaches to maximum frequency at other extremity.	We may have combination of these frequency curves. No specific shape for mixed curve.

44. LCB is _____

    a. Latur Crime Branch

    b. Lower Class Branch

    c. Lower Class Boundary

    d. a or c

45. Relative Frequency of a particular class

    a. Lies between 0 and 1

    b. Lies between -1 and 1

    c. Lies between -1 and zero

    d. None of these

46. The primary data is collected by

    a. Interview Method   b. Observation Method

    c. Questionnaire Method   d. All of these

47. The quickest method to collect primary data is :

    a. Personal Interview   b. Indirect Interview

    c. Telephonic interview   d. Observation Method

48. In case of Rail accident, the appropriate method of data collection is by :

    a. Personal Interview   b. Direct Interview

    c. Indirect Interview   d. All of these

49. Which method of data collection covers widest area

    a. Telephonic interview   b. Mailed Questionnaire Method

    c. Direct Interview Method   d. All of these

50. The amount of non-responses are maximum in case of

a. Mailed Questionnaire Method

b. Interview Method

c. Observation Method

d. All of these

51. The accuracy and consistency of data can be verified by -

a. Internal checking

b. External checking

c. Scrutiny

d. None of these

52. The unit of measurement in tabulation is shown in the

a. Box Head

b. Body

c. Caption

d. Stub

53. In tabulation, source of the data if any is shown in the

a. Foot-Note

b. Body

c. Caption

d. Stub

54. Hidden trend, if any, in a data can be noticed by

a. Textual presentation

b. Tabulation

c. Diagrammatic Presentation

d. None of these

55. The most accurate (Best) method of data presentation is :

a. Diagrammatic Presentation

b. Tabulation

c. Textual presentation

d. None of these

56. The chart used logarithms of a variable is known as :

a. Line chart

b. Ratio chart

c. Multiple line chart

d. Pie chart

My Notes :

_____
_____
_____
_____
_____
_____

57. Pie diagram is used for?

a. Comparing diff. components and their relation to total

b. Representing qualitative data in a circle

c. Representing quantitative data in a circle

d. b or c

58. A frequency distribution

a. Arranges observations in increasing order

b. Arranges observations in number of groups

c. is for time pass

d. All of these

59. Frequency distribution of a continuous variable is known as

a. Grouped frequency distribution

b. Simple frequency distribution

c. a or b

d. a and b

60. The distribution of shares is an example of frequency distribution of :

a. A discrete variable

b. A continuous variable

c. An attribute

d. None of these

61. The distribution of profits of a blue chip company relates to :

a. A discrete variable

b. A continuous variable

c. An attribute

d. None of these

62. Mutually exclusive classification

a. Excludes both the class limits

b. Excludes UCL but includes LCL

c. Includes UCL and excludes LCL

d. None of these

My Notes :

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

63. Out of 1000 workers, 25% were industrial workers and rest were agricultural workers. 300 persons enjoyed world cup matches on T.V, 30% of people who had not watched world cup matches were industrial workers. What is agri. no. of workers who had enjoyed world cup matches on T.V.?

a. 260   b. 240   c. 230   d. 250

64. The number of accident for 7 days in a locality are given below :

No. of accidents	0	1	2	3	4	5	6
Frequency	15	19	22	31	9	3	2

What is no. of cases when 3 or less accidents occur?

a. 56   b. 6   c. 68   d. 87

65. The follow data relates to income :

Income	500 - 999	1000 - 1499	1500 - 1999	2000 - 2499
No. of persons	15	28	36	7

What is % of persons earning more than ₹ 1500?

a. 43%   b. 50%   c. 40%   d. None of these

66. The following data relate to the marks of group of students :

Marks	Below 10	Below 20	Below 30	Below 40	Below 50
No. of Students	15	38	65	84	100

How many students have marks more than 30?

a. 65   b. 184   c. 35   d. None of these

67. Find number of observations between 250 and 300 from the following data :

Value	More than 200	More than 250	More than 300	More than 350
No. of Observations	56	38	15	0

　　　a. 56　　　　　　　b. 23　　　　　　　c. 15　　　　　　　d. 8

68. Cost of sugar in a month under the heads material, labour, expenses, overheads are ₹ 12,20,35,23 respectively. What is diff between central angles for the largest and smallest components of cost of sugar?

　　　a. 72°　　　　　　b. 48°　　　　　　c. 56°　　　　　　d. 92°

69. The distribution of profits of a company generally follows :

　　　a. J shaped freq. curve　　　　　　　　　　b. U-shaped frequency curve

　　　c. Bell shaped freq. curve　　　　　　　　　d. None of these

70. The distribution most commonly used is :

　　　a. Mixed　　　　　　b. U-shaped　　　　　　c. Bell shaped　　　　d. None of these

71. Graph is a _____

　　　a. Line diagram　　　　　b. Bar-diagram　　　　　c. Pie-diagram　　　　d. Pictogram

72. (Class frequency / class width) is defined as _____

　　　a. Frequency density　　　　　b. Frequency distribution　　　　c. Both　　　　d. None

73. Tally Marks determines

　　　a. Class width　　　　　　　　　　　　b. Class boundary

　　　c. Class limit　　　　　　　　　　　　d. Class Frequency

74. An area diagram is

a. Histogram

b. Frequency Polygon

c. Ogives

d. None

75. Ogive is a _____

a. Line diagram

b. Bar diagram

c. Both

d. None

76. Unequal width of classes in a frequency distribution do not cause any difficulty in construction of _____

a. Ogive

b. Frequency Polygon

c. Histogram

d. None of these

77. Graphical presentation of cumulative frequency distribution is called as _____

a. Histogram

b. Ogive

c. Both

d. None of these

78. The most common form of diagrammatic presentation of a grouped frequency distribution is

a. Ogive

b. Histogram

c. Frequency Polygon

d. None of these

79. Vertical Bar diagram may appear somewhat alike -

a. Histogram

b. Frequency Polygon

c. Ogive

d. None of these

80. Number of types of cumulative frequency is :

a. One

b. Two

c. Three

d. Four

My Notes :

_____
_____
_____
_____
_____
_____
_____

81. A representative value of a class interval for the calculation of Mean, SD, MD, etc. is

a. Class interval
b. Class limit
c. Class mark
d. None

82. In all statistical calculations & diagrams involving end points of classes _____ are used.

a. Class Boundaries
b. Class Values
c. both
d. None

83. Upper boundary of a class coincide with Lower boundary of next class.

a. True
b. False
c. Both
d. None

84. The lower extreme point of a class is called as _____

a. Lower Class Limit
b. Lower Class Boundary
c. Both
d. None

85. When one end of the class is not specified, the class is called as _____

a. Open end class
b. Close end class
c. Both
d. None of these

86. When all classes have equal width, the heights of rectangles in histogram will be numerically equal to the _____ .

a. Class Frequencies
b. Class Boundaries
c. Both
d. None of these

87. To find 'Mode of data' graphically we use _____ .

a. Ogives
b. Frequency Polygon
c. Histogram
d. None of these

88. In representing simple frequency distributions of a discrete variable _____ is useful.

a. Ogives
b. Histogram
c. Frequency Polygon
d. None of these

89. Diagrammatic presentation of cumulative frequency distribution is _____ .

    a. Frequency Polygon   b. Ogives

    c. Histogram   d. None of these

90.

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	8	15	6	4

For the class 20-30 cumulative frequency is :

    a. 20   b. 13   c. 15   d. 28

91. Breadth of rectangle is equal to length of class interval in _____ .

    a. Ogives   b. Histogram   c. Line diagram   d. None

92. In Histogram classes are taken _____

    a. Overlapping   b. None Overlapping   c. Both   d. None

93. There are _____ methods of classification of data.

    a. 4   b. 3   c. 2   d. 1

94. There are _____ methods of presentation of data.

    a. 4   b. 3   c. 2   d. 1

95. For the overlapping classes 0-10, 10-20, 20-30, etc. the class mark of 0 - 10 is

    a. 5   b. 4.50   c. 4   d. 10

96. For the classes 0-9, 10-19, 20-29, 30-39, the class mark of 10-19 is _____

    a. 14.50   b. 15   c. 20   d. 16

97. Mutually inclusive classification is meant for _____

    a. Discrete variable   b. Continuous variable   c. Both   d. None

98. Mutually exclusive classification is meant for _____

    a. Discrete variable   b. Continuous variable   c. Both   d. None

101.

Characteristic	Discrete / Continuous Variable / Attribute
a. Income	
b. Profit	
c Blue-colour	
d. Honesty	
e. Nationality	
f. No. of shares	
g. Age	
h. No. of members	
i. Drinking habit	
j. Beauty	
k. Children in a family	
l. Love	
m. Batch size	

102.

Class - Interval	Frequency
0 - 10	5
10 - 20	8
20 - 40	9
40 - 60	10
Mutually Exclusive Classification	

Class - Interval	Frequency
0 - 9	25
10 - 29	28
30 - 89	35
90 - 189	40
Mutually Inclusive Classification	

My Notes :

_____
_____
_____
_____
_____
_____
_____

1. 5 Measures of Central Tendency are :

2.

AM of simple data =

AM of grouped data =

AM of grouped & classified data =

3. Find AM of : 80,63,90,101,65,73,88,100.

4. Find AM of

x	20	30	40	50	60
f	28	52	68	72	80

5. Find AM of

C.I	10-20	20-40	40-80	80-120
f	15	18	23	84

My Notes :

6. **Find AM of**

C.I	10-19	20-39	40-69
f	33	32	85

7. **AM is magnitude-wise central number**

Median is

Mode is

8. **Find Median for 81,36,25,35,38,43,50**

9.

Median - If No. of observations are

Odd   Even

10. **Empirical relation between Mean, Median, Mode**

11. **Find Median, Mode for**

C.I	10-20	20-30	30-40	40-60	60-100
f	15	18	33	22	16

12. **Find AM, Median, Mode for**
80, 60, 90, 90, 80, 90, 50, 90, 10, 5, 18, 16, 12, 16, 55

13. **For Simple data - Formulae**

Median =

Q_1 =

Q_3 =

D_6 =

P_{71} =

14.

Fractiles	Divides the data in ___ equal parts	No. of fractiles	Notations
Median			
Quartiles			
Deciles			
Percentiles			

15. For Grouped and Classified data

Median =

$Q_3 =$

$D_2 =$

$P_{80} =$

16.

Measure	Simple Data	Grouped Data
AM		
GM		
HM		
Median		
Mode		
Q_1		
D_7		
P_{61}		

17. Find P_{85} for

C.I	10-18	20-38	40-98	100-168
f	28	36	56	28

18. Properties of AM

19. **Find AM, GM, HM for - 2,6,8,9,3,13,20,18**

20. **If $\bar{x}_1 = 80$, $\bar{x}_2 = 120$ and Combined AM = 103. Find $n_1 : n_2$**

21.

Best Measure of Central Tendency =

For Open Class interval
Best Measure of Central Tendency =

22.

For n observations =

For n distinct observations =

For 2 Observations =

23.

Observations	AM	GM	HM
p,q			
a,b,c,d			
60,20,80			
5,10,20,0			

If one of the observation is zero then :

GM =

HM =

24. Find GM, HM, AM for

x	5	6	7	8
f	1	2	2	3

25.

For 2 Groups	
Combined AM =	
Combined GM =	
Combined HM =	

26.

For 3 Groups	
Combined AM =	
Combined GM =	
Combined HM =	

27. $n_1 = 30$; $n_2 = 20$; $S_1 = 3$; $S_2 = 4$; $\bar{x}_1 = 40$, $\bar{x}_2 = 50$. Find combined SD.

28.

Dispersion means :

Measures of dispersion are used to measure :

29.

Measures of Dispersion

Absolute   **Relative**

30. **For simple data :**

Range =

M.D =

S.D =

Q.D =

31. **Find Range, M.D, S.D, Q.D for - 20,28,35,40,48,60,65,68**

32. **For Grouped data :**

Range =

M.D =

S.D =

Q.D =

33. Find Range, M.D, S.D, Q.D

CI	10-20	20-30	30-40	40-50
f	5	7	2	6

34. If Mode = 66. Find missing frequency

Cl	30-40	40-50	50-60	60-70	70-80	80-90
f	8	16	22	28	-	12

35.

S.D of 2 Observations =

S.D of 1st 'n' natural numbers =

36.

M.D about	Simple Data	Grouped Data
AM		
Median		
Mode		

My Notes :

37.

Q.D = Semi inter Quartile Range =

Coefficient of Quartile Deviation =

38.

If y = a + bx then

39.

	Old Data	If 25 is subtracted from each obs^n	If every observation is increased by 5	If every observation is mutliplied by 10	If every observation is divided by 20
AM	30				
Median	50				
Mode	60				
Range	70				
MD	28				
SD	36				
QD	55				

40. **Impact on coefficient of variation :**

If 20 is added to each observation	
If 30 is subtracted from each observation	
If every observation is multiplied by 80	
If every observation is divided by 100	

41.

	Runs of last 8 innings
Batsman A	**80, 60, 65, 85, 75, 40, 35, 20**
Batsman B	**35, 25, 50, 25, 55, 60, 25, 15**

Who is more consistent?

42.

Best measure of dispersion	
For comparison purpose	
For Open Class Intervals	

43. Find S.D, Variance, Coefficient of Variation for 18,19,20,28,35.
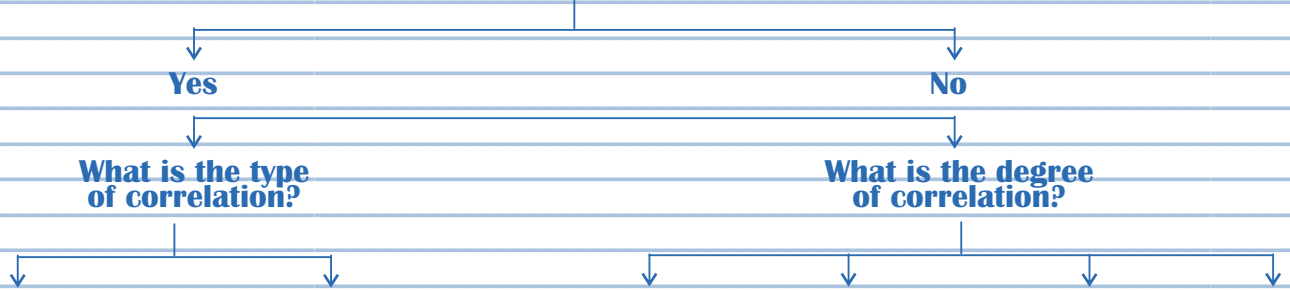
My Notes :

44.

Observations x,y,z

AM =   GM =   HM =

45. **Find Range & Coefficient of range for : ₹ 90, ₹ 80, ₹ 60, ₹ 30, ₹ 10, ₹ 5, ₹ 65, ₹ 78**

46. **If 3x + 5y = 85; AM of x = 3; SD of x = 0.75. Find AM of y, S.D of y**

1. What is correlation and what is regression?

2.

Whether correlation between 2 variables exists or not?

Yes — No

What is the type
of correlation?

What is the degree
of correlation?

3. Methods to measure correlation between 2 variables :

a.
b.
c.
d.

My Notes :

4. Scatter diagram showing

1.

2.

3.

4.

5.

Scatter diagrams can give an idea about type of correlation but it can't give exact degree of correlation.

5. Find Spearman's rank correlation coefficient.

x	30	80	45	63	91	28	222
y	101	111	93	123	86	65	79

6. Find Coefficient of Concurrent Deviation for -

x	60	90	28	36	51	58	90	95	101	63
y	28	111	93	28	63	78	53	28	99	100

In the product column : No. of positive signs = x

No. of negative signs = y

x > y	r is positive
x < y	r is negative
x = y	r = 0

7.

Spearman's Rank Correlation Coefficient.

8. **Find Karl Pearson's** _____

x	8	3	11	9	6
y	5	8	13	20	28

9.

r	Type of Correlation
r = 1.00	
0.30 < r < 0.80	
0.80 < r <1.00	
r = 0	
r = -1.00	
-1.00 < r < -0.80	
-0.80 < r < -0.30	
0 < r < 0.30	
-0.30 < r < 0	

_____
_____
_____
_____

10.

Covariance of (x,y) =
_____
_____

SD_x =
_____
_____

SD_y =
_____
_____

11. If v = 3x+8; u = 8y-19; r_{xy} = 0.80

r_{uv} =
_____

Correlation coefficient is unaffected by change / shift of origin as well as by change in scale.

12. If u = -3x+53; v = -18y+99; r_{xy} = 0.70

r_{uv} =
_____

13. If u = -18x+55; v = 16y+100; r_{xy} = 0.85

r_{uv} =
_____

14. If u = -8x+19; v = -16y-33; r_{xy} = -0.56

r_{uv} =
_____

15. Find Karl Pearson's Coefficient for -

x	30	60	90	50
y	20	30	40	80

My Notes :

16.

Regression Analysis

After studying correlation between 2 variables, the process of estimating the value of one variable on the basis of other is known as regression analysis

x = Given	y = Given
y = ?	x = ?

r, b_{yx}, b_{xy} all are unit-free

Reg line of y on x is :

Reg line of x on y is :

Reg coefficient of y on x is = b_{yx} =

Reg coefficient of x on y is = b_{xy} =

17.

b_{yx} =

b_{xy} =

$b_{yx} \cdot b_{xy}$ =

Therefore 'r' is G.M. of

r	b_{yx}	b_{xy}
0	0	0
+	+	+
-	-	-

18. If $\bar{x} = 30$, $\bar{y} = 90$, $\sigma_x = 5$, $\sigma_y = 8$, $r = 0.80$

Find a. Reg line of x on y

b. Reg line of y on x

c. If x =25, y =?

d. If y =85, x =?

$b_{yx} = r . \dfrac{\sigma_y}{\sigma_x}$	Therefore, $b_{yx} . b_{xy}$	**Square of correlation coefficient**
	$= r . \dfrac{\sigma_y}{\sigma_x} \times r . \dfrac{\sigma_x}{\sigma_y}$	**is equal to product of 2 regression coefficients.**
	$= r^2$	
$b_{xy} = r . \dfrac{\sigma_x}{\sigma_y}$	$r = \sqrt{b_{yx} . b_{xy}}$	**Correlation coefficient 'r' is G.M. of**
	$r^2 = b_{yx} . b_{xy}$	**2 regression coefficients $b_{yx} . b_{xy}$**

My Notes :

19.

If Reg. line of x on y is written in the form of

If Reg. line of x on y is 2x-3y=95. Find b_{xy}

20. On solving 2 regression lines simultameously. If we get x = 50 and y = 90, then

24.

$$\text{Probable Error} = 0.674 \times \left(\frac{1 - r^2}{\sqrt{N}}\right)$$

$$\text{Standard Error} = \left(\frac{1 - r^2}{\sqrt{N}}\right)$$

Coefficient of determination =

Coefficient of Non-determination =

25. 2 regression lines become identical i.e. they coincide when r = -1 or r = 1.

26. If r = 0; then regression lines are $\perp$ to each other.

When there is no correlation between 2 variables then regression lines will be $\perp$ to each other.

Probability

1. Probability is the

2. Classical Definition of Probability

3.

Coin

Dice

Card

4.

A coin is tossed 2 times what is probability of getting

| 2 heads | 1 head | Atleast 1 head | Atmost 1 head |

My Notes :

5.

An unbaised coin is tossed 3 times. Find the probability of getting

2 tails	Atleast 2 heads	No tails	Atmost 2 tails

6.

An unbaised coin is tossed 4 times. What is the probability of getting

2 heads	3 tails	Atleast 3 tails	Atmost 3 tails

7.

A dice is rolled once. What is the probability of getting

3 Points	4 Points	1 Point	Atmost 3 Points	Atleast 5 Points	Odd Number as point	Prime Number as point

8. **A dice is rolled twice what is the probability of getting**

→ **7 points as sum**

→ **8 points as sum**

→ **9 or more points**

→ **Atleast 3 points**

→ **Odd points on both dice**

→ **Odd points on atleast one dice**

→ **Even points on both dice**

→ **5 or 7 points**

→ **Sum as prime number**

→ **Odd points on atleast one dice**

→ **Sum as odd number**

→ **Sum as even number**

9. A card is drawn from a well shuffled pack of 52 cards. What is probability of getting :

a. A diamond =

b. A King =

c. A Black Card =

d. A Black Queen =

e. A Jack =

10. P(A∪B) =

P(A′) =

P(B′) =

P (A∩B) =

P(A-B) =

P(B-A) =

P(A′∩B′) =

P(A∪B′) =

P(B∪A′) =

P(A △ B) =

P(A∪B∪C) =

11.

A B

0.20 0.15 0.30

0.35
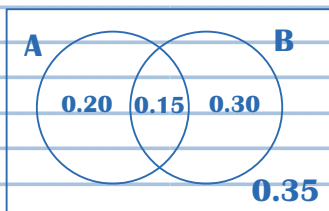
P(A) =

P(B) =

P(A′)=

P(B′)=

P(A∪B) =

P(A∩B) =

P(A-B) =

P(B-A) =

P(A′∩B′) =

P(A △ B) =

12. De-morgan's rule of probability (with diagram)

13. If 2 dice are rolled then

Sum of points on 2 dice	Probability
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

14. A card is drawn from a well shuffled pack of 52 cards then what is probability that it is a -

a. Spade =

b. Queen =

c. Spade and Queen =

d. Spade or Queen =

e. Spade but not Queen =

f. Queen but not Spade =

g. Neither Spade nor Queen =

15. A, B are said to be mutually exclusive events then :

16. A, B are said to be mutually exhaustive events then :

17. A, B are said to be independent events when :

18.

Events A & B are said to be	If
	$P(A \cap B) = 0$
	$P(A \cup B) = 1.00$
	$P(A \cap B) = P(A) \times P(B)$
	$P(A) = P(B)$

My Notes :

19. 2 dice are rolled. It is observed that sum of points is 9. What is probability that 4 has appeared on one of the dice?

20.

P (A/B) =   P (A$'$/B) =

P (B/A) =   P (A$'$/B$'$) =

P (A/B$'$) =   P (B$'$/A) =

P (B/A$'$) =   P (B$'$/A$'$) =

21. If A, B are independent events then :

My Notes :
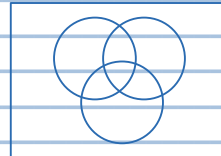
22.

8 Red
6 White
5 Black

3 balls are drawn. What is probability of getting

2 Red balls   Atleast 2 white Balls   Atmost 1 Black Ball

23.

1. P(A∪B)
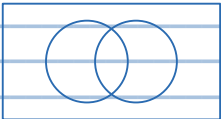
2. P(A∩B)
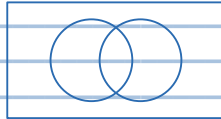
3. P(A∩B′)
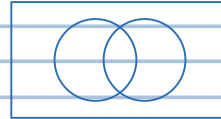
4. P(B∩A′)
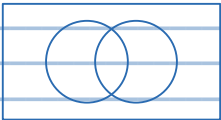
5. P(A′∩B′)
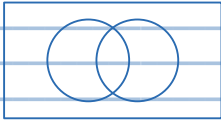
6. P(A△B)
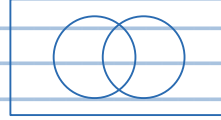
7. P(A∪B′)
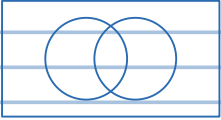
8. P(B∪A′)
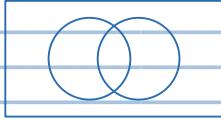
9. P(A′∪B′)
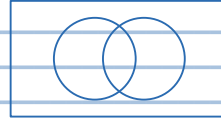
10. P(A∪B∪C)
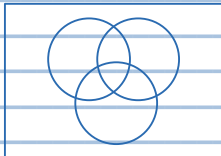
11. P(A′∩B′∩C′)

My Notes :

24. If P(A) = 0.30, P(B) = 0.40, P(A∩B) = 0.15. Find

P(A') =

P(A△B) =

P(B') =

P(A/B) =

P(A∪B) =

P(A-B) =

P(B/A) =

P(B-A) =

P(A'∩B') =

P(A/B') =

P(A ∪ B') =

P(A'/B') =

P(B ∪ A') =

25.

Probability of A passing exam is 0.30. and B passing exam is 0.40. What is the probability that

Both will pass	Only A will pass	Only B will pass	Atleast one will pass	One & Only One will pass	Atleast one will fail

26.

In a leap year selected at random what is probability of getting

53 Mondays	52 Mondays	Atleast 52 Mondays	54 Mondays

27.

In a non-leap year selected at random what is probability of getting

53 Sundays	52 Sundays	Atleast 52 Sundays	54 Sundays

28.

In a year selected at random what is the probability of getting

52 Tuesdays

53 Tuesdays

29. What is probability that 15th day of a randomly selected month is Sunday?

30.

x	30	60	90	120	150
Prob. x	0.20	0.30	0.10	0.15	0.25

Find E(x), SD$_x$, Variance of x

31. If odds in favour of event A are 3 : 8. Find P(A), P(A′)

32. If odds against event B are 8 : 13. Find P(B), P(B′)

33. If odds in favour of event A are 3 : 11; Odds against event B are 2 : 15; A,B are independent events, then find :
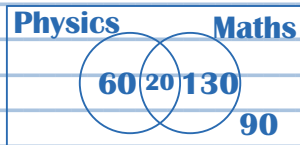
P(A) =

P(B) =

P(A∩B) =

P(A∪B) =

P(A' ∩ B') =

P(A-B) =

P(B-A) =

34.

Physics   Maths

60 20 130

90

Find probability that a student likes

a. Maths if it is known that he likes physics =

b. Physics if it is known that he doesn't likes maths =
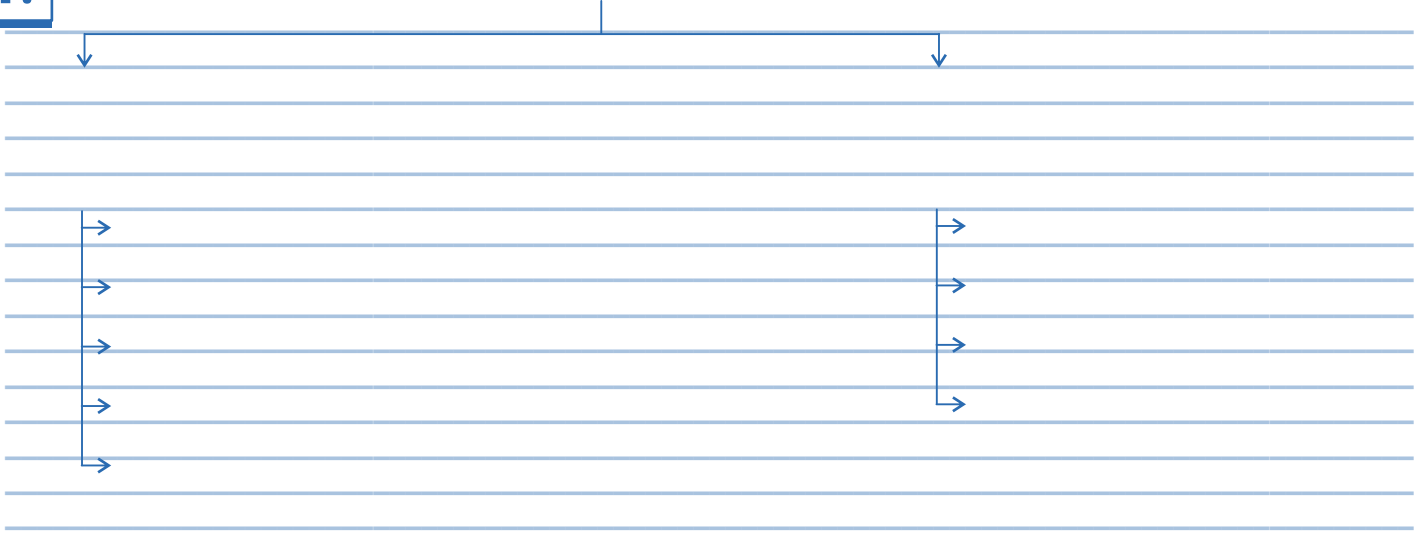
35.

1 Ball

| 10 Red | 2 Red |
| 8 White | 3 White |

1 ball is drawn.
What is the probability that it is a red ball?

1.

Theoretical Distributions

2.

Binomail's Distribution

prob (x)

where,

n =

p =

x =

q =

3.

4 coins are tossed. What is probability of getting 3 heads

Classical Approach   **Binomial's Approach**

My Notes :

_____
_____
_____
_____
_____
_____
_____
_____

4. 5 coins are tossed. What is probability of getting 3 heads

Classical Approach   Binomial's Approach

5. Mode of Binomial's distribution =   Largest integer contained in (n+1)P
if (n+1)P is non integer. Data is uni-modal.
If (n+1)P is an integer, then data is bi-modal.
Modes are (n+1)P and (n+1)P-1

6. Freq $(x) = N \times {}^nC_x \cdot p^x \cdot q^{n-x}$

7. 8 Coins are tossed 40,000 times. Find expected frequency of at most 7 heads?

8. 10 coins are tossed. Find probability of getting

a. 2 heads

b. 3 heads

c. 3 tails

d. 4 tails

e. 5 or 7 heads

f. 4 or 5 or 6 heads

g. Atmost 9 heads

h. Atleast 2 heads

I. Atleast 1 tails

j. Atmost 2 tails

9. 2 dice are rolled what is probability of getting odd points on atleast one dice

Classical Approach   Binomial's Approach

10. 15 dates are selected at random. What is the probability of getting 4 Sundays?

11. 4 x prob(x=4) = prob(x=2) for Binomial's distribution and n=6. Find values of p,q?

My Notes :

12. 5 dice are rolled. What is the probability of getting at least 5 points on atmost 1 dice?

13. Summary of Binomial's Distribution.

14.

n	p	q	Mean	SD	Variance
20	0.20				
80		0.60			
120	0.05				
200			45		
	0.20		50		
		0.20	80		
			100		80
60	0.35				
2,000		0.05			
8,000		0.98			
10,000	0.63				

15. **Prob (x) as per poisson's model =**

_____
_____
_____
_____
_____
_____

16. **If m = 4. Find prob (x=5) for poisson's variate.**

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

17. If SD of poisson's variate is 2. Find probability (-2.30 < x ≤ 1)

18. If m = 3, for poisson's variate. Find prob (x ≥ 1), prob (x > 1), prob (3 ≤ x ≤ 5)

19.

n = 200, p = 0.01, find prob (x=2)

Binomial's Model

Poisson's Model

20. If m = 5. Find prob (-8 $\leq$ x $\leq$ 1.56) for poisson's variate

21. p(x=3) = p(x=4). Find mean of Poisson's Distribution.

22. Difference between Binomial's & Poisson's Distribution.

Binomial's Distribution	Poisson's Distribution

23. Summary of Poisson's Distribution

24. Normal Distribution

1. It is applicable only for distribution of a 'continous variable'
2. Derived by Karl Gauss :- known as Gaussian's theorem.
3. It is based on assumption of Normality.
4. As per assumption of Normality a variable is said to be normally distributed if 50% observations are less than AM and 50% of the observations are more than AM.
5. prob(x < щ) = 50%

   Prob (x > щ) = 50%
6. Z = Normal curve wefficient = $\left(\dfrac{x-щ}{\sigma}\right)$

7. There are 2 parameters of normal distribution namely щ, σ^2 Therefore It is a Bi-parametric distribution
8. Normal curve is a Bell-shaped curve, symmetrical about AM.
9. In probability distribution of this type:

   Prob(x ≤ 50) = prob(x < 50)

   Prob(x ≥ 85) = prob(x > 85)

   Therefore, we can say that : probability that a particular variable will assume a specific value is always 0.
10. AM= Median= Mode
11. Median = $\dfrac{(Q_3+Q_1)}{2}$ = щ = mode
12. Q.D. = $\dfrac{(Q_3-Q_1)}{2}$ = 0.6750 X SD
13. MD = 0.80 X SD
14. Q_3 = щ + 0.675σ

    Q_1 = щ - 0.675σ
15. Φ(a) represents area from -∞ to a.
16. Total area covered by normal curve = 1.00= 100%
17. Expected frequency
18. For normal distribution : SD > MD > QD
19. Points of inflexion for normal distribution are

25. For Normal Distribution

1. Relation between MD & SD

   MD =

2. Relation between QD & SD

   QD=

3. Relation between MD & QD

26.

Q₃	Q₁	Q.D.	M.D.	S.D.
50	20			
69.60	29.40			
86	40			
91.80	40.63			
81.88	43.63			
28.93	12.13			
60.86	12.98			

27.

QD < MD < SD

1. What is Derivative or Differential function?

2. Derivative of f(x) is f'(x)

f'(x) by first principle =

3.

f(x)	f'(x)
x	
x^2	
x^3	
x^n	
Log x	
a^x	
e^x	
$\sqrt{x}$	
constant = k	

4.

$\dfrac{d}{dx}(u + v) =$

$\dfrac{d}{dx}(u - v) =$

$\dfrac{d}{dx}(u \times v) =$

$\dfrac{d}{dx}\left(\dfrac{u}{v}\right) =$

My Notes :

5.

Find $\dfrac{dy}{dx}$ if

a) $y = 3x^2 + 5x - 2$

b) $y = a^x + x^a + a^a$

c) $y = \dfrac{1}{3} x^3 - 5x^2 + 6x - 2 \log x + 3$

d) $y = \dfrac{e^x}{\text{Log } x}$

e) $y = \dfrac{2x}{3x^3 + 7}$

f) $y = 2^x \cdot \text{Log } x$

g) $y = 5^x \cdot x^{10}$

h) $y = \dfrac{3x + 5}{5x + 8}$

6.

Chain Rule Find $\dfrac{dy}{dx}$ if $y = a^{(2x+3)}$

7. Find $\dfrac{dy}{dx}$ if

a. $y = 5^{(2x+3)}$

b. $y = (8x+3)^2$

c. $y = e^{\log x}$

d. $y = \sqrt{(5x+13)}$

e. $y = \sqrt{2x^2 + 5x + 3}$

f. $y = \sqrt{\text{Log } x}$

8.

$y = f(x)$	$\dfrac{dy}{dx} = f'(x)$
$f(x)^n$	
$a^{f(x)}$	
$e^{f(x)}$	
$\text{Log }[f(x)]$	
$\sqrt{f(x)}$	

My Notes :

_____
_____
_____
_____
_____
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_____
_____

9. $y = at^3$, $x = 2bt$. Find $\dfrac{dy}{dx}$

10. $y = x^x$. Find $\dfrac{dy}{dx}$

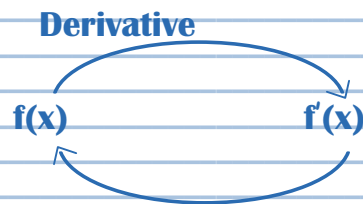**11.** $y = \sqrt{\dfrac{1-x}{1+x}}$ Find $\dfrac{dy}{dx}$

12. Find $\dfrac{d^2y}{dx^2}$ If $y = 16x^3 - 22x^2 + 18x + 54$

13. Find the gradient of curve $y = 3x^2 - 5x + 4$ at point (1,2)

14. If $f(x) = x^k$ and $f'(1) = 10$; then value of k is

15. $y = e^{\sqrt{2x}}$ Find $\dfrac{dy}{dx}$

My Notes :

16.

$$f(x) = \frac{3x^2 - 2x + 5}{2x + 1} \quad \text{Find } f'(x)$$

17.

If $y = x^{x^{x^{x^{\cdots \infty \text{ terms}}}}}$ Find $\dfrac{dy}{dx}$

18.

Derivative

$f(x)$ $f'(x)$

Integration

Therefore, Integration is anti-derivative

19.

$\int x^n \cdot dx =$

$\int k \cdot dx =$

$\int a^x \cdot dx =$

$\int 1 \cdot dx =$

$\int e^x \cdot dx =$

$\int \frac{1}{x} \cdot dx =$

20.

$\int \sqrt{x} \cdot dx =$

$\int \frac{1}{\sqrt{x}} \cdot dx =$

$\int e^{-3x} \cdot dx =$

$\int 3^x \cdot dx =$

$\int x \sqrt{x} \cdot dx =$

21.

$\int \left(x + \frac{1}{x^2} \right) \cdot dx =$

22. $\int (e^{3x} + e^{-4x}) \cdot dx =$

23. $\int \dfrac{x^3 + 5x^2 - 3}{x+2} \cdot dx =$

24. $\int \dfrac{x^3}{(x^2 + 1)^3} \cdot dx =$

(Solve by Method of Substitution)

25. $\int \dfrac{1}{x^2-a^2}\,dx = \dfrac{1}{2a}\,\text{Log}\,\left|\dfrac{x-a}{x+a}\right| + c$

26. $\int \dfrac{1}{a^2-x^2}\,dx = \dfrac{1}{2a}\,\text{Log}\,\left|\dfrac{a+x}{a-x}\right| + c$

27. $\int \dfrac{1}{\sqrt{x^2+a^2}}\,dx = \text{Log}\,\left|x + \sqrt{x^2+a^2}\right| + c$

28. $\int \dfrac{1}{\sqrt{x^2-a^2}}\,dx = \text{Log}\,\left|x + \sqrt{x^2-a^2}\right| + c$

29. $\int e^x\,[f(x) + f'(x)]\cdot dx = e^x \cdot f(x) + c$

30. $\int \sqrt{x^2+a^2}\cdot dx = \dfrac{x}{2}\sqrt{x^2+a^2} + \dfrac{a^2}{2}\,\text{Log}\,\left|x + \sqrt{x^2+a^2}\right| + c$

31. $\int \sqrt{x^2-a^2}\cdot dx = \dfrac{x}{2}\sqrt{x^2-a^2} - \dfrac{a^2}{2}\,\text{Log}\,\left|x + \sqrt{x^2-a^2}\right| + c$

32. $\int \dfrac{f'(x)}{f(x)}\,dx = \text{Log}\,f(x) + c$

33. **Integration by parts**

$\int (u\cdot v)\cdot dx = u\int v\cdot dx - \int\left[\dfrac{du}{dx} \times \int v\cdot dx\right]\cdot dx$

34. If $\int f(x)\cdot dx = g(x) + c$; then

$\int_a^b f(x) = g(b) - g(a)$

My Notes :

_____
_____
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_____
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_____
_____

1. Series is classified into

A. Number Series.

B. Alphabet Series.

C. Letter Series.

2. 2, 7, 16, ?, 46, 67, 92

a. 29   b. 31   c. 41   d. None

3. 2, 5, 10, 17, ?, 37

a. 30   b. 21   c. 25   d. 26

4. 1, 1, 4, 8, 9, 27, 16, ?

a. 32   b. 48   c. 64   d. 50

5. 120, 99, 80, 63, ?

a. 48   b. 40   c. 30   d. None

6. 10, 11, 22, 23, 46, 47, 94, 95

a. 96   b. 110   c. 190   d. 180

7. 1000, 500, 250, 125, ?

a. 69   b. 25   c. 60   d. 62.50

8. 5760, 960, 192, ?, 16, 8

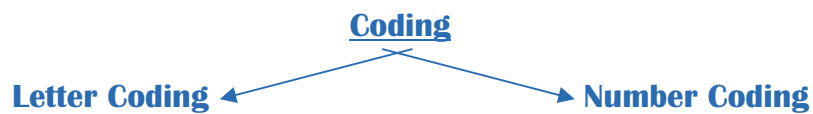   a. 48   b. 64   c. 384   d. None of these

9. 5, 25, 36, 6, 8, 64, 625, ?

    a. 25   b. 390625   c. 125   d. 5

10. 2, 3, 5, 7, 11, 13, ?

    a. 19   b. 17   c. 15   d. 21

11.

Coding

Letter Coding ← → **Number Coding**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

12. If MENTION is coded as NFOUJPO then EXPERT will be coded as -

13. If VINOD is coded as WHONE then SUSHEEL will be coded as -

14. If MOBILE is coded as NQEMQK then ASHWAT will be coded as -

15. If MAT is coded as 34 then PILLAR will be coded as -

16. Find the odd man out -

i. January, May, December, April

ii. 10, 14, 16, 28, 17, 30, 38, 42

iii. 25, 49, 35, 81, 121, 64, 4

iv. 78, 91, 26, 52, 130, 117, 82, 143, 39

v. 1, 64, 27, 16, 125, 343

vi. Physics, Biology, Chemistry, Accounts

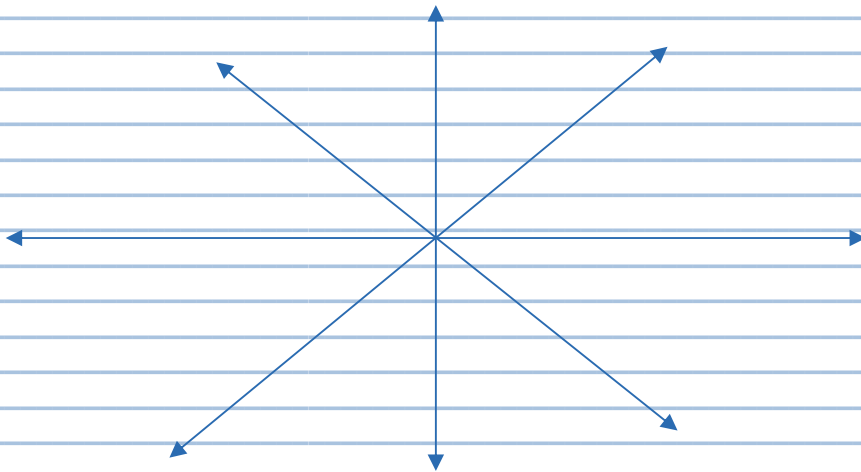vii. Book, Pen, Pencil, Bike

17. Find the odd man out - 49, 39, 36, 225

39 : only

225 : only

36 : only

49 : only

18.

19. North then right

20. North left then left then right

21. West then left then right

22. Southwest then left then right

23. Northwest then right

_____
_____
_____
_____
_____
_____

24. Seating arrangements are classified into

i) _____

ii) _____

iii) _____

_____

25. A   B   C   D   E   F   facing south
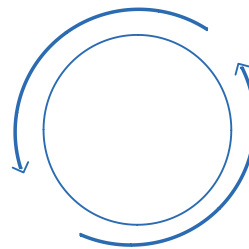
Who is to the right of A : _____

Who is to the left of B : _____

Who is to the immediate right of C : _____
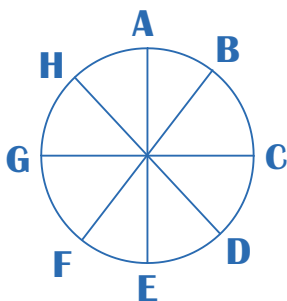
Who is to the immediate left of E : _____

26.
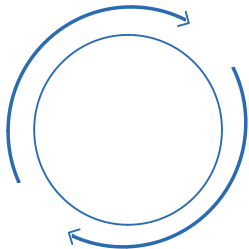
Clockwise   **Anti-clockwise**

27.

If A, B, C, D, E, F, G, H are facing centre, then

A facing _____
B _____
C _____
D _____
E _____
F _____
G _____
H _____

28.

1. Father's Father
2. Father's Mother
3. Father's Brother
4. Father's Sister
5. Children of Uncle
6. Wife of Uncle
7. Children of Aunt
8. Husband of Aunt
9. Mother's Father
10. Mother's Mother
11. Mother's Brother
12. Mother's Sister
13. Children of Maternal Uncle
14. Wife of Maternal Uncle
15. Grandfather's Son
16. Grandfather's Only son
17. Mother or Father's Mother
18. Grandmother's Mother
19. Grandmother's Father
20. Grandson's Daughter
21. Grandson's Son
22. Grand-daughter's Son
23. Grand-daughter's Daughter
24. Daughter's Husband
25. Son's Wife
26. Husband's Father
27. Husband's Mother
28. Wife's Brother
29. Wife's Sister
30. Wife's Father
31. Wife's Mother
32. Brother's Son
33. Brother's Daughter
34. Sister's Son
35. Sister's Daughter
36. Brother's Wife
37. Sister's Husband
38. My father's son is my
39. My father's daughter is my
40. My father's father is my

41. My mother's brother is my

42. My daughter's husband is my

43. My son's wife is my

44. My Brother's wife is my

45. My brother's daughter is my

46. My brother's son is my

47. My wife's father is my

48. My wife's mother is my

49. My wife's sister is my

50. My wife's brother is my

51. My father's wife is my

52. My mother's husband is my

53. My son's daughter is my

54. My daughter's son is my