CHAPTER 1
RATIO & PROPORTION
HOME WORK

1. If A : B = 3 : 4, B : C = 5 : 6 and C : D = 11 : 9, then A : D is :
   (a) 50 : 60   (b) 55 : 72   (c) 60 : 70   (d) 65 : 75

2. If a : b = 3 : 4, then (6a +b) : (4a + 5b) is :
   (a) 1 : 2   (b) 3 : 5   (c) 7 : 8   (d) 11 : 16

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

4. If X and Y shared ₹ 1100 in the ratio 1 : 10, how much did X get ?

   (a) ₹ 99   (b) ₹ 100 (c) ₹ 101 (d) ₹ 110

5. If 2x = 3y = 4z, then x : y : z is :
   (a) 2 : 3 : 4   (b) 4 : 3 : 2   (c) 6 : 4 : 3   (d) 3 : 4 : 2

6. If $x : y$ = 7 : 9 and $y : z$ = 5 : 4, then $x : y : z$ is :
   (a) 7 : 45 : 36   (b) 35 : 45 : 36 (c) 28 : 36 : 35 (d) None

7. The fourth proportional to 3.5 and 87.5 is :
   (a) 35   (b) $\dfrac{7}{5}$ (c) $\dfrac{5}{7}$ (d) 12.6

8. Mean proportional to 3. 5 and 87.5 is :
   (a) 17.5   (b) 12   (c) 14   (d) 16

9. Third proportional to 9 and 12 is :
   (a) $6\sqrt{3}$ (b) 10.5   (c) 16   (d) None

10. What must be added to each term of the ratio 49 : 68 so that it becomes 3 : 4 ?
    (a) 3   (b) 5   (c) 8   (d) 9

11. What least number must be added to each one of 6, 14, 18, 38 to make them in proportion?
    (a) 1   (b) 2   (c) 3   (d) 4

12. What least number must be subtracted from each of the numbers 14, 17, 34, 42 so that remainders may be proportional ?
    (a) 0   (b) 1   (c) 2   (d) 7

13. A fraction bears the same ratio to $\dfrac{1}{27}$ as $\dfrac{3}{7}$ does to $\dfrac{5}{9}$. The fraction is :

    (a) $\dfrac{7}{45}$ (b) $\dfrac{1}{35}$ (c) $\dfrac{45}{7}$ (d) $\dfrac{5}{21}$

14. ₹ 1980 are divided among A, B, C so that half of A's part, one-third of B' s part and one-sixth of C' part are equal. Then, B's part is :
    (a) ₹ 660   (b) ₹ 360   (c) ₹ 1080   (d) ₹ 540

15. If A's money is to B's money as 4 : 5 and B's money is to C's money as 2 : 3 and A has Rs. 800, then C has :
    (a) ₹ 1000   (b) ₹ 1200   (c) ₹ 1500   (d) ₹ 2000

16. 94 is divided into two parts in such a way that the fifth part of the first and the eighth part of the second are in the ratio 3 : 4. The first part is:
    (a) 27   (b) 30   (c) 36   (d) 48

17. ₹ 1360 have been divided among A, B, C such that A gets $\dfrac{2}{3}$ of what B gets and B gets $\dfrac{1}{4}$ of what C gets. Then, B's share is :
    (a) ₹ 120   (b) ₹ 160   (c) ₹ 240   (d) ₹ 320

18. ₹ 770 have been divided among A, B, C such a way that A receives $\dfrac{2}{9}$ th of what B and C together receive. Then A's share is :
    (a) ₹ 140   (b) ₹ 154   (c) ₹ 165   (d) ₹ 170

19. ₹ 4850 have been divided among A, B, C such that if their shares be diminished by ₹ 15, ₹10 and ₹ 25 respectively, the remainders are in the ratio 3 : 4 : 5. Then, B's share is :
    (a) ₹ 1595   (b) ₹ 1610   (c) ₹ 1626.66   (d) ₹ 1600

20. A sum of ₹ 7000 is divided among A, B, C in such a way that shares of A and B are in the ratio 2 : 3 and those of B and C are in the ratio 4 : 5. The amount received by C is :
    (a) ₹ 2600   (b) ₹2800   (c) ₹ 3000   (d) ₹ 3900

21. A sum of ₹ 53 is divided among A, B, C in such a way that A gets ₹ 7 more than what B gets and B gets ₹8 more than what C gets. The ratio of their shares is :
    (a) 16 : 9 : 18   (b) 25 : 18 : 10   (c) 18 : 25 : 10   (d) 15 : 8 : 30

22. A bag contains ₹ 600 in the form of one-rupee, 50-paise and 25-paise coins in the ratio 3 : 4 : 12. The number of 25-paise coins is :
    (a) 600   (b) 900   (c) 1200   (d) 1376

23. A sum of money is divided among A, B, C such that to each rupee A gets, B gets 65 paisa and C gets 35 paisa. If C's share is ₹ 560, the sum is:
(a) ₹ 2400 (b) ₹ 2800 (c) ₹3200 (d) ₹3600

24. ₹5625 are divided among A, B, C so that A may receive one-half as much as B and C together receive and B receives one-fourth of what A and C together receive. The share of A is more than that of B by :
(a) ₹ 750 (b) ₹775 (c) ₹1500 (d) ₹1600

25. A certain amount was divided between X and Y in the ratio 4 : 3. If Y's share was ₹4800, the total amount was:
(a) ₹11200 (b) ₹6400 (c) ₹ 19200 (d) ₹ 39200

26. The ratio of number of boys and girls in a school of 720 students is 7: 5. How many more girls should be admitted to make the ratio 1 : 1 ?
(a) 90 (b) 120 (c) 220 (d) 240

27. A boy 1.4 m tall casts a shadow 1.2 m long at the time when a building casts a shadow 5.4 m long. The height of the building is :
(a) 4.63 m (b) 3.21 m (c) 6.3 m (d) 5.6 m

28. The incomes of A and B are in the ratio 3 : 2 and their expenditures in the ratio 5 : 3. If each saves ₹ 1500 then B's income is :
(a) ₹ 6000 (b) ₹ 4500 (c) ₹3000 (d) ₹7500

29. The prices of a scooter and a moped are in the ratio 9 : 5. If a scooter costs₹6800 more than a moped, the price of a scooter is :
(a) ₹17000 (b) ₹13600 (c) ₹ 15300 (d) None

30. The cost making an article is divided between materials, labor and overheads in the ratio of 5 : 3 : 1. If the materials cost ₹6.90, the cost of the article is :
(a) ₹ 13.80 (b) ₹ 12.42 (c) ₹11.56(d) ₹ 9.83

ANSWERS

1.	(b)	2.	(d)	3.	(d)	4.	(b)	5.	(c)	6.	(b)
7.	(a)	8.	(c)	9.	(c)	10.	(c)	11.	(b)	12.	(c)
13.	(b)	14.	(d)	15.	(c)	16.	(b)	17.	(c)	18.	(a)
19.	(b)	20.	(c)	21.	(b)	22.	(b)	23.	(c)	24.	(a)
25.	(a)	26.	(b)	27.	(c)	28.	(a)	29.	(c)	30.	(b)

CHAPTER 2
INDICES, SURDS AND LOGARITHM
HOME WORK

INDICES And SURDS:

1. The value of $\left(\sqrt{8}\right)^{1/3}$ is :

    (a)   2   (b)   4   (c) $\sqrt{2}$ (d)   8

2. The value of $5^{1/4} \times (125)^{0.25}$ is :

    (a) $\sqrt{5}$ (b) $5\sqrt{5}$ (c)   5   (d)   25

3. The value of $\left(\dfrac{32}{243}\right)^{-4/5}$ is :

    (a) $\dfrac{4}{9}$ (b) $\dfrac{9}{4}$ (c) $\dfrac{16}{81}$ (d) $\dfrac{81}{16}$

4. $\left(\dfrac{1}{216}\right)^{-2/3} \div \left(\dfrac{1}{27}\right)^{-4/3} = ?$

    (a) $\dfrac{3}{4}$ (b) $\dfrac{2}{3}$ (c) $\dfrac{4}{9}$ (d) $\dfrac{1}{8}$

5. $\dfrac{2^{n+4} - 2 \cdot 2^n}{2 \cdot 2^{n+3}} + 2^{-3}$ is equal to :

    (a) 2^{n+1} (b) $-2^{n+1} + \dfrac{1}{8}$ (c) $\dfrac{9}{8} - 2^n$ (d)   1

6. If $5\sqrt{5} \times 5^3 \div 5^{-3/2} = 5^{a+2}$, the value of a is :

    (a)   4   (b)   5   (c)   6   (d)   8

7. If $\sqrt{2^n} = 64$, then the value of n is :

    (a)   2   (b)   4   (c)   6   (d)   12

8. $\dfrac{(0.6)^0 - (0.1)^{-1}}{\left(\dfrac{3}{2^3}\right)^{-1} \cdot \left(\dfrac{3}{2}\right)^3 + \left(-\dfrac{1}{3}\right)^{-1}}$ is equal to :

    (a) $-\dfrac{3}{2}$ (b) $-\dfrac{1}{2}$ (c) $\dfrac{2}{3}$ (d) $\dfrac{3}{2}$

9. If $\dfrac{9^n \times 3^5 \times (27)^3}{3 \times (81)^4} = 27$, then n equals :

(a) 0 　(b) 2 　(c) 3 　(d) 4

10. If $\dfrac{9^n (3^2)(3^{-n/2})^{-2} - 27^n}{3^{3m}(2^3)} = \dfrac{1}{27}$, then

(a) m – n = 2 　(b) m – n = 1 　(c) m – n = -2 　(d) m – n = -1

11. If $\left(\sqrt{3}\right)^5 \times 9^2 = 3^\alpha \times 3\sqrt{3}$, then α equals :

(a) 2 　(b) 3 　(c) 4 　(d) 5

12. The simplified form of $\dfrac{x^{7/2} \cdot \sqrt{y^3}}{x^{5/2} \cdot \sqrt{y}}$ is :

(a) $\dfrac{x^2}{y}$ 　(b) $\dfrac{x^3}{y^2}$ 　(c) $\dfrac{x^6}{y^3}$ 　(d) xy

13. $\left(\dfrac{1}{1+x^{n-m}} + \dfrac{1}{1+x^{m-n}}\right)$ is equal to :

(a) 0 　(b) 1 　(c) $\dfrac{1}{2}$ 　(d) x^{m+n}

14. If x, y, z are real numbers, then the value of :

$\sqrt{x^{-1}y} \cdot \sqrt{y^{-1}z} \cdot \sqrt{z^{-1}x}$ is :

(a) xyz 　(b) $\sqrt{xyz}$ 　(c) $\dfrac{1}{xyz}$ 　(d) 1

15. $\dfrac{1}{1+x^{(b-a)}+x^{(c-a)}} + \dfrac{1}{1+x^{(a-b)}+x^{(c-b)}} + \dfrac{1}{1+x^{(b-c)}+x^{(a-c)}} = ?$

(a) x^{a-b-c} 　(b) 1 　(c) 0 　(d) 3

16. $\left(\dfrac{x^b}{x^c}\right)^{(b+c-a)} \cdot \left(\dfrac{x^c}{x^a}\right)^{(c+a-b)} \cdot \left(\dfrac{x^a}{x^b}\right)^{(a+b-c)} = ?$

(a) x^{abc} 　(b) x^{a+b+c} 　(c) $x^{ab+bc+ca}$ 　(d) 1

17. If $pqr = 1$, then $\left(\dfrac{1}{1+p+q^{-1}} + \dfrac{1}{1+q+r^{-1}} + \dfrac{1}{1+r+p^{-1}}\right) = ?$

(a) 0 　(b) $\dfrac{1}{pq}$ 　(c) pq 　(d) 1

18.　$\left(\dfrac{x^a}{x^b}\right)^{(a+b)} \times \left(\dfrac{x^b}{x^c}\right)^{(b+c)} \times \left(\dfrac{x^c}{x^a}\right)^{(c+a)} = ?$

　　(a)　　0　　(b)　　x^{abc}　　(c)　　x^{a+b+c}　　(d)　　1

19.　$\left(\dfrac{x^a}{x^b}\right)^{1/ab} \times \left(\dfrac{x^b}{x^c}\right)^{1/bc} \times \left(\dfrac{x^c}{x^a}\right)^{1/ca} = ?$

　　(a)　　1　　(b)　　$x^{1/abc}$　　(c)　　$x^{1/(ab+bc+ca)}$　　(d)　　None.

20.　If $2^{x+4} - 2^{x+2} = 3$, then x is equal to :

　　(a)　　0　　(b)　　2　　(c)　　−1　　(d)　　−2

21.　If $2^{x-1} + 2^{x+1} = 320$, then x is equal to :

　　(a)　　6　　(b)　　8　　(c)　　5　　(d)　　7

22.　If $2^{2x-1} = \dfrac{1}{8^{x-3}}$, then the value of x is :

　　(a)　　3　　(b)　　2　　(c)　　0　　(d)　　−2

23.　If $\left(\dfrac{a}{b}\right)^{x-1} = \left(\dfrac{b}{a}\right)^{x-3}$, then x is equal to :

　　(a)　　1　　(b)　　$\dfrac{1}{2}$　　(c)　　2　　(d)　　$\dfrac{7}{2}$

24.　If $2^x \times 8^{1/5} = 2^{1/5}$, then x is equal to :

　　(a)　　$\dfrac{1}{5}$　　(b)　　$-\dfrac{1}{5}$　　(c)　　$\dfrac{2}{5}$　　(d)　　$-\dfrac{2}{5}$

25.　If $\sqrt{5+\sqrt[3]{x}} = 3$, then x is equal to :

　　(a)　　125　　(b)　　64　　(c)　　27　　(d)　　9

26.　If $5^{x+3} = (25)^{3x-4}$, then the value of x is :

　　(a)　　$\dfrac{5}{11}$　　(b)　　$\dfrac{11}{5}$　　(c)　　$\dfrac{11}{3}$　　(d)　　$\dfrac{13}{5}$

27.　If $\sqrt[3]{32} = 2^x$, then x is equal to :

　　(a)　　5　　(b)　　3　　(c)　　$\dfrac{3}{5}$　　(d)　　$\dfrac{5}{3}$

28. If $a^x = b^y = c^z$ and $b^2 = ac$, then y equals :

(a) $\dfrac{xz}{x+z}$ (b) $\dfrac{xz}{2(x-z)}$ (c) $\dfrac{xz}{2(z-x)}$ (d) $\dfrac{2xz}{(x+z)}$

29. If $2^x = 3^y = 6^{-z}$, then $\left(\dfrac{1}{x}+\dfrac{1}{y}+\dfrac{1}{z}\right)$ is equal to :

(a) 0 (b) 1 (c) $\dfrac{3}{2}$ (d) $-\dfrac{1}{2}$

30. If $x = y^a$, $y = z^b$ and $z = x^c$, then the value of abc is :
(a) 4 (b) 3 (c) 2 (d) 1

31. $\sqrt{2}, \sqrt[3]{4}$ and $\sqrt[4]{6}$ in ascending order are :

(a) $\sqrt{2}, \sqrt[3]{4}, \sqrt[4]{6}$ (b) $\sqrt[4]{6}, \sqrt{2}, \sqrt[3]{4}$ (c) $\sqrt[4]{6}, \sqrt[3]{4}, \sqrt{2}$ (d) $\sqrt{2}, \sqrt[4]{6}, \sqrt[3]{4}$

32. If m and n are whole numbers such that $m^n = 121$, then the value of $(m-1)^{n+1}$ is :
(a) 1 (b) 10 (c) 121 (d) 1000

33. If $1 - x^8 = 65$ and $1 - x^4 = 64$, the value of x is :

(a) $\pm\dfrac{1}{\sqrt{2}}$ (b) $\pm\sqrt{2}$ (c) $\pm\dfrac{1}{2\sqrt{2}}$ (d) $\pm 2\sqrt{2}$

34. If $\left[3^{m^2} \div \left(3^m\right)^2\right]^{1/m} = 81$, the value of m is :

(a) 3 (b) 6 (c) –3 (d) –6

35. If $2^a + 3^b = 17$ and $2^{a+2} - 3^{b+1} = 5$, the values of a and b respectively are:
(a) 2, 3 (b) –2, 3 (c) 2, -3 (d) 3, 2

36. Show that $\dfrac{16(32)^x - 2^{3x-2}.4^{x+1}}{15(2)^{x-1}(16)^x} - \dfrac{5(5)^{x-1}}{\sqrt{5^{2x}}}$

(a) 1 (b) -1 (c) 4 (d) 0

37. $x^{a^2b^{-1}c^{-1}} . x^{b^2c^{-1}a^{-1}} . x^{c^2a^{-1}b^{-1}} - x^3$ would reduce to zero if $a + b + c$ is given by
(a) 1 (b) –1 (c) 0 (d) None

38. The value of z is given by the following if $z^{z\sqrt{z}} = \left(z\sqrt{z}\right)^z$

(a) 2 (b) $\dfrac{3}{2}$ (c) $-\dfrac{3}{2}$ (d) $\dfrac{9}{4}$

39. If $ax^{2/3}+bx^{1/3}+ c= 0$ then the value of $a^3 x^2 + b^3 x + c^3$ is given by
(a) 3abcx (b) -3abcx (c) 3abc (d) -3abc

40. If $a^P = b$, $b^q = c$, $c^r = a$ the value of pqr is given by
    (a)   0   (b)   1   (c)   -1   (d)   None

41. If $2^a = 3^b = (12)^c$ then $\frac{1}{c} - \frac{1}{b} - \frac{2}{a}$ reduces to
    (a)   1   (b)   0   (c)   2   (d)   None

42. If $3^a = 5^b = (75)^c$ then the value of ab-c(2a +b) reduces to
    (a)   1   (b)   0   (c)   3   (d)   5

43. If $2^a = 4^b = 8^c$ and abc = 288 then the value $\frac{1}{2a} + \frac{1}{4b} + \frac{1}{8c}$ is given by
    (a) $\frac{1}{8}$ (b) $-\frac{1}{8}$ (c) $\frac{11}{96}$ (d) $-\frac{11}{96}$

44. If $a^b = b^a$ then the value of $\left(\frac{a}{b}\right)^{\frac{a}{b}} - a^{\frac{a}{b}-1}$ reduces to
    (a)   a   (b)   b   (c)   0   (d)   None

45. If $P + \sqrt{3}Q + \sqrt{5}R + \sqrt{15}S = \frac{1}{1+\sqrt{3}+\sqrt{5}}$ then the value of P is
    (a)   7/11   (b)   3/11   (c)   -1/11   (d)   -2/11

ANSWERS

1.	(c)	2.	(c)	3.	(d)	4.	(c)	5.	(d)
6.	(a)	7.	(d)	8.	(a)	9.	(c)	10.	(b)
11.	(d)	12.	(d)	13.	(b)	14.	(d)	15.	(b)
16.	(d)	17.	(d)	18.	(d)	19.	(a)	20.	(d)
21.	(d)	22.	(b)	23.	(c)	24.	(d)	25.	(b)
26.	(b)	27.	(d)	28.	(d)	29.	(a)	30.	(d)
31.	(d)	32.	(d)	33.	(c)	34.	(b)	35.	(d)
36.	(a)	37.	(c)	38.	(d)	39.	(a)	40.	(b)
41.	(b)	42.	(b)	43.	(c)	44.	(c)	45.	(a)

LOGARITHM

1. If $a^x = b$, then :
(a) $\log_b x = a$ (b) $\log_a x = b$ (c) $\log_x a = b$ (d) $\log_a b = x$

2. If $\log_a b = c$, then :
(a) $b^c = a$ (b) $a^c = b$ (c) $a^b = c$ (d) $b^a = c$

3. $\log_a (pq)$ is equal to :
(a) $(\log_a p)(\log_a q)$ (b) $\log_a p + \log_a q$
(c) $\log_a p - \log_a q$ (d) $\log_p a + \log_q a$

4. $\log_a \left(\dfrac{p}{q} \right)$ is equal to :

(a) $\log_a p - \log_a q$ (b) $(\log_a p) \div (\log_a q)$
(c) $\log_a p + \log_a q$ (d) $\log_a q - \log_a p$

5. $\log_a 4 = \dfrac{1}{4}$, then a is equal to :
(a) 16   (b) 64   (c) 128   (d) 256

6. The value of $\log_{27} 9$ is :
(a) $\dfrac{1}{3}$ (b) $\dfrac{3}{2}$ (c) $\dfrac{2}{3}$ (d) 3

7. The value of $\log_5 \left(\dfrac{1}{625} \right)$ is :

(a) 4   (b) -4 (c) $\dfrac{1}{4}$ (d) $-\dfrac{1}{4}$

8. The value of $\log_{\sqrt{2}} 16$ is :

(a) 4   (b) 8   (c) 16   (d) $\dfrac{1}{8}$

9. If $\log_8 x = \dfrac{2}{3}$, then the value of x is :

(a) $\dfrac{3}{4}$ (b) $\dfrac{4}{3}$ (c) 4   (d) 3

10. If $\log_x \left(\dfrac{9}{16} \right) = -\dfrac{1}{2}$, then the value of x is :

(a) $-\dfrac{3}{4}$ (b) $\dfrac{3}{4}$ (c) $\dfrac{81}{256}$ (d) $\dfrac{256}{81}$

11. If $\log_{10} x = -2$, then x is :

(a) $\sqrt{10}$ (b) $\dfrac{1}{\sqrt{10}}$ (c) $\dfrac{1}{20}$ (d) $\dfrac{1}{100}$

12. If $\log_{10000} x = -\dfrac{1}{4}$, then the value of x is :

(a) $\dfrac{1}{10}$ (b) $-\dfrac{1}{100}$ (c) $\dfrac{1}{1000}$ (d) $\dfrac{1}{10000}$

13. The value of $\log_{.01}(1000)$ is :

(a) $\dfrac{1}{3}$ (b) $-\dfrac{1}{3}$ (c) $\dfrac{3}{2}$ (d) $-\dfrac{3}{2}$

14. The value of $\log_2 (\log_5 625)$ is :

(a) 2   (b) 5   (c) 10   (d) 15

15. The value of $\log_{10} 0.00001$ is :

(a) -4 (b) -5 (c) $-\dfrac{1}{4}$ (d) $-\dfrac{1}{5}$

16. If $\log_x 0.1 = -\dfrac{1}{3}$, then the value of x is :

(a) 10   (b) 100   (c) 1000   (d) $\dfrac{1}{1000}$

17. The value of $25^{\log_5 4}$ is :
(a) 16   (b) 32   (c) 20   (d) 625

18. If $\log_{10}\left[\log_{10}\left(\log_{10} x\right)\right] = 0,$ then the value of x is :
(a) 10   (b) 10^2 (c) 10^3 (d) 10^{10}

19. The value of $\log_2\left[\log_2 \log_2 \log_2 (65536)\right]$ is :
(a) 0   (b) 1   (c) 2   (d) 4

20. If $\log_2\left[\log_3\left(\log_2 x\right)\right] = 1$, then x is equal to :
(a) 512   (b) 128   (c) 12   (d) 0

21. If $\log_{10} 2x = 1,$ the value of x is :

(a) $\dfrac{1}{5}$ (b) 100   (c) 5   (d) 20

22. $[\log_{10} 10 + \log_{10} 100 + \log_{10} 1000 + \log_{10} 10000 + \log_{10} 100000]$ is :
(a) 15   (b) $\log_1 11111$ (c) $\log_{10} 1111$ (d) $14\log_{10} 100$

23. The value of $\left(\log\dfrac{3}{5} + \log\dfrac{5}{36} + \log 12 \right)$ is equal to :

   (a) $\log 5$ (b) $\log 3$ (c) $\log 2$ (d)   0

24. $\left(\log\dfrac{11}{5} + \log\dfrac{14}{3} - \log\dfrac{22}{15} \right)$ is equal to :

   (a) $\log 2$ (b) $\log 3$ (c) $\log 5$ (d) $\log 7$

25. The value of $\left(\dfrac{1}{3}\log_{10} 125 - 2\log_{10} 4 + \log_{10} 32 \right)$ is :

   (a)   0   (b) $\dfrac{4}{5}$ (c)   2   (d)   1

26. The value of $7\log\left(\dfrac{16}{15}\right) + 5\log\left(\dfrac{25}{24}\right) + 3\log\left(\dfrac{81}{80}\right)$ is :

   (a) $\log 2$ (b) $\log 4$ (c) $\log 6$ (d) $\log 8$

27. $\log_{1/3} 81$ is equal to :

   (a) -27 (b) -4 (c)   4   (d)   27

28. $\log_{2\sqrt{3}} 1728$ is equal to :

   (a)   3   (b)   5   (c)   6   (d)   9

29. If $\log_{10} x + \log_{10} y = z$, then x is equal to :

   (a) $\dfrac{z}{y}$ (b) $\dfrac{10^z}{y}$ (c) yz (d) $(10^z)\,y$

30. $\log\left(\dfrac{a^2}{bc}\right) + \log\left(\dfrac{b^2}{ac}\right) + \log\left(\dfrac{c^2}{ab}\right)$ is :

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

31. $\dfrac{1}{(\log_a bc)+1} + \dfrac{1}{(\log_b ca)+1} + \dfrac{1}{(\log_c ab)+1}$ is equal to :

   (a)   1   (b)   2   (c)   3   (d) $\dfrac{3}{2}$

32. $\dfrac{1}{\log_{xy}(xyz)} + \dfrac{1}{\log_{yz}(xyz)} + \dfrac{1}{\log_{zx}(xyz)}$ is equal to :

   (a)   1   (b)   2   (c)   3   (d)   4

33. The value of $\left(\log_b a \times \log_c b \times \log_a c \right)$ is :

    (a)   0   (b)   1   (c)   abc   (d) $a+b+c$

34. $\left(\log_b a \right) \times \left(\log_a b \right)$ is equal to :

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

35. Which of the following statements is not correct?

    (a) $\log_{10} 1 = 0$ (b) $\log(1+2+3) = \log 1 + \log 2 + \log 3$

    (c) $\log_{10} 10 = 1$ (d) $\log(2+3) = \log(2 \times 3)$

36. If $\log(x+y) = \log x + \log y$ and x = 1.15683, then the value of y is :

    (a) $\bar{7}.736$ (b)   7.376 (c)   3.456 (d)   1.234

37. Given that $\log_{10} 2 = 0.3010,$ the value of $\log_{10} 5$ is :

    (a)   0.3241   (b)   0.6911   (c)   0.6990   (d)   0.7525

38. If $\log_{10} 2 = 0.30103,$ then the value of $\log_{10} 50$ is :

    (a) .69897   (b) 1.30103   (c) 1.69897   (d) 2.30103

39. If $\log_{10} 2 = 0.3010$, the value of $\log_{10} 80$ is :

    (a)   1.9030   (b)   1.6020   (c)   3.9030   (d)   None of these

40. The value of $\left(\log_9 27 + \log_8 32 \right)$ is :

    (a)   4   (b)   7   (c) $\dfrac{7}{2}$ (d) $\dfrac{19}{6}$

41. If $\log_{10} 2 = 0.3010,$ then the value of $\log_{10} 25$ is :

    (a)   1.5050   (b)   1.3980   (c)   1.2040   (d)   0.6020

42. If $\log 2 = 0.3010$ and $5^x = 400$, then x is equal to :

    (a) 2.40   (b) 3.72   (c) 4.36   (d) 1

43. $\left(\log_{10} 40000 - \log_{10} 4 \right)$ equals :

    (a)   4   (b)   10000   (c) $\log_{10} 39996$ (d)   39996

44. Consider the following statements :

    1. $\log_{10} (0.1)^2 + \log_{10} 10 \cdot \log_{10} 100 = 0$ 2. $\log_{10} \log_{10} 10 = 1$

    3. $\log_{10} \sqrt{10} + \log_{10} \sqrt{10} = 1$

    Choose the correct answer :

    (a)   1 and 3 are correct   (b)   2 & 3 are correct

    (c)   1 and 2 are correct   (d)   all are correct

45. $\left(\log_5 3\right)\times\left(\log_3 625\right)$ equal :
(a)   1   (b)   2   (c)   3   (d)   4

46. If $\log_{10} 2=0.3010$ and $\log_{10} 3=0.4771$, then the value of $\log_{100}(.72)$ is :

(a) $\overline{1}.9286$ (b) $\overline{1}.8573$ (c)   1.8572   (d)   .9286

47. The value of $\log_{10} 0.02$ lies between :
(a)   0 and 1   (b)   −2 and −1   (c)   0 & -1   (d)   −2 & -3

48. If a, b, c are three consecutive integers, then $\log(ac+1)$ has the value :
(a) $\left(\log b\right)^2$ (b) $\log b$ (c) $2\log b$ (d) $\log 2b$

49. Given $\log_{10} 2=0.3010,$ and $\log_{10} 3=0.4771,$ then the value of $\log_{10} 1.5$ is :
(a)   0.7161 (b)   0.1761   (c)   0.7116   (d)   0.7611

50. Given $\log 2=0.30103$, the number of digits in 5^{20} is :
(a)   14   (b)   16   (c)   18   (d)   25

51. Value of $\log_{10} 1$ is :
(a)   1   (b)   0   (c)   0.1   (d)   0.01

52. Which one of the following is not true in general?
(a) $\log x+\log y=\log xy$ (b) $\log x+\log y=\log(x+y)$

(c) $\log x-\log y=\log\left(\dfrac{x}{y}\right)$ (d) $\log x^y = y\log x$

53. Which of the following is correct?
(a) $\log m^n = \left(\log m\right)^n$ (b) $\left(\log_a b\right)\times\left(\log_b a\right)=1$
(c) $\log(m\times n)=\left(\log m\times\log n\right)$ (d) $\log(m-n)=\log m-\log n$

54. The value of $\left(\log_b a\right)\left(\log_c b\right)\left(\log_a c\right)$ is :
(a)   0   (b)   1   (c)   10   (d) $\log(abc)$

55. If $\log_e x+\log_e(1+x)=0$, then :
(a) $x^2+x-1=0$ (b) $x^2+x+1=0$
(c) $x^2+x-e=0$ (d) $x^2+x+e=0$

56. If $\log_4(x^2+x)-\log_4(x+1)=2,$ then the value of x is :
(a)   2   (b)   4   (c)   5   (d)   16

57. If $\log_8 x + \log_8 \dfrac{1}{6} = \dfrac{1}{3}$, then x is equal to :

(a)   12   (b)   16   (c)   18   (d)   24

58. The value of $\left(\dfrac{1}{\log_3 60} + \dfrac{1}{\log_4 60} + \dfrac{1}{\log_5 60} \right)$ is :

(a)   5   (b)   0   (c)   60   (d)   1

59. If $\log_{10} 125 + \log_{10} 8 = x$, then x is equal to :

(a)   −3   (b)   3   (c) $\dfrac{1}{3}$ (d)   .064

60. If $\log a + \log b = \log(a+b)$, then :

(a) $a = b$ (b) $b = \dfrac{1}{a}$

(c) $b = \left(\dfrac{a-1}{a} \right)$ (d) $b = \left(\dfrac{a}{a-1} \right)$

61. If $\log \dfrac{m}{n} + \log \dfrac{n}{m} = \log(m+n)$, then :

(a) $m+n=1$ (b) $\dfrac{m}{n}=1$ (c) $m-n=1$ (d) $m^2 - n^2 = 1$

62. The value of :
$(\log_3 4)(\log_4 5)(\log_5 6)(\log_6 7)(\log_7 8)(\log_8 9)$ is :

(a)   2   (b)   7   (c)   8   (d)   33

63. If $\log(x+1) + \log(x-1) = \log 3$, then x is equal to :

(a)   1   (b)   2   (c)   3   (d)   4

64. If $\dfrac{\log 8}{\log 2} = x$, then x is equal to :

(a)   2   (b)   3   (c)   4   (d) $1/2$

65. The value of x satisfying $\log_{32} x = 0.8$ is :

(a)   25.6   (b)   16   (c)   10   (d)   12.8

66. If $\log_{10} x = 1.9675$, then $\log_{10}(1000x)$ is :

(a)   19.675   (b)   4.9675   (c) 1.9675×3 (d)   1975.5

67. The mantissa of $\log 3274$ is .5150. The value of log 0.3274 is :

(a)   0.5150   (b)   1.5150   (c) $\bar{1}.5150$ (d) $\bar{2}.5150$

68. The characteristic in log (6.7432×10^{-5}) is :
   (a)   −5   (b)   −4   (c)   1   (d)   5

69. If $\log_{10} 2 = .3010$, then $\log_2 10$ is :
   (a)   .3322   (b)   3.2320   (c)   3.3222   (d)   5

70. If $\log_{10}(.1) = -1$, then $\log_{10}(.001)$ is :
   (a)   −1.3   (b)   −2   (c)   −2.3   (d)   −3

71. If $\dfrac{\log a}{b-c} = \dfrac{\log b}{c-a} = \dfrac{\log c}{a-b}$, then the value of $a^a \, b^b \, c^c$ is :
   (a)   abc   (b) $\dfrac{1}{abc}$ (c)   1   (d)   log (abc)

72. $16^{\log_4 5}$ equals :
   (a)   5   (b)   16   (c)   25   (d) $\dfrac{5}{64}$

73. $\log_5 5 \cdot \log_4 9 \cdot \log_3 2$ simplifies to :
   (a)   2   (b)   1   (c)   5   (d) $\dfrac{3}{2}$

74. $\log_2 7$ is :
   (a)   an integer   (b)   a prime number
   (c)   a rational number   (d)   an irrational number

75. If log a, log b, log c are in A.P., then :
   (a)   a, b, c are in G.P.   (b) a^2, b^2, c^2 are in G.P.
   (c)   a, b, c are in A.P.   (d) $\log a^2, \log b^2, \log c^2$ are in G.P.

76. The value of $\left[\dfrac{1}{\log_{(q/p)} x} + \dfrac{1}{\log_{(q/r)} x} + \dfrac{1}{\log_{(r/p)} x} \right]$ is :
   (a)   3   (b)   2   (c)   1   (d)   0

77. If $\log_4 x + \log_2 x = 6$, then the value of x is :
   (a)   2   (b)   4   (c)   8   (d)   16

78. The value of $3^{-\frac{1}{2}\log_3 9}$ is :
   (a)   −1   (b) $-\dfrac{1}{3}$ (c) $\dfrac{1}{3}$ (d) $-\dfrac{3}{2}$

79. If $10^x = 1.73$ and $\log_{10} 1730 = 3.2380$, then x equals :
   (a)   1.2380   (b)   0.2380   (c)   2.380   (d)   2.2380

80. $a^{logb-logc} \times b^{logc-loga} \times c^{loga-logb}$ has a value of
     (a)   1   (b)   0   (c)   −1   (d)   None

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

82. The value of $(bc)^{\log b/c} . (ca)^{\log c/a} . (ab)^{\log a/b}$ is
     (a)   0   (b)   1   (c)   −1   (d)   None

83. If $\dfrac{\log a}{y-z} = \dfrac{\log b}{z-x} = \dfrac{\log c}{x-y}$ the value of abc is
     (a)   0   (b)   1   (c)   −1   (d)   None

84. If $a = b^2 = c^3 = d^4$ then the value of $\log_a (abcd)$ is
     (a) $1 + \dfrac{1}{2}+\dfrac{1}{3}+\dfrac{1}{4}$ (b) $1 + \dfrac{1}{2!}+\dfrac{1}{3!}+\dfrac{1}{4!}$

     (c)   1+2+3+4   (d)   None

85. If $\log \dfrac{a+b}{3} = \dfrac{1}{2}(\log a + \log b)$ then the value of $\dfrac{a}{b}+\dfrac{b}{a}$ is
     (a)   2   (b)   5   (c)   7   (d)   3

86. If $a^2 + b^2 = 7ab$ then the value of is $\log\dfrac{a+b}{3} - \dfrac{\log a}{2} - \dfrac{\log b}{2}$
     (a)   0   (b)   1   (c)   -1   (d)   7

87. If $a^3 + b^3 = 0$ then the value of $\log(a + b) - \dfrac{1}{2}(\log a + \log b + \log 3)$ is equal to
     (a)   0   (b)   1   (c)   -1   (d)   3

88. If $x^{2a-3} y^{2a} = x^{6-a} y^{5a}$ then the value of $a\log\left(x/y\right)$ is

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

.

ANSWERS

1.	(d)	**2.**	(b)	**3.**	(b)	**4.**	(a)	**5.**	(d)	**6.**	(c)
7.	(b)	**8.**	(b)	**9.**	(c)	**10.**	(d)	**11.**	(d)	**12.**	(a)
13.	(d)	**14.**	(a)	**15.**	(b)	**16.**	(c)	**17.**	(a)	**18.**	(d)
19.	(b)	**20.**	(a)	**21.**	(c)	**22.**	(a)	**23**	(d)	**24.**	(d)
25.	(d)	**26.**	(a)	**27.**	(b)	**28.**	(c)	**29.**	(b)	**30.**	(b)
31.	(a)	**32.**	(b)	**33.**	(b)	**34.**	(d)	**35.**	(d)	**36.**	(b)
37.	(c)	**38.**	(c)	**39.**	(a)	**40.**	(d)	**41.**	(b)	**42.**	(b)
43.	(a)	**44.**	(a)	**45.**	(d)	**46.**	(a)	**47.**	(b)	**48.**	(c)
49.	(b)	**50.**	(a)	**51.**	(b)	**52.**	(b)	**53.**	(b)	**54.**	(b)
55.	(a)	**56.**	(d)	**57.**	(a)	**58.**	(d)	**59.**	(b)	**60.**	(d)
61.	(a)	**62.**	(a)	**63.**	(b)	**64.**	(b)	**65.**	(b)	**66.**	(b)
67.	(c)	**68.**	(a)	**69.**	(c)	**70.**	(d)	**71.**	(c)	**72.**	(c)
73.	(b)	**74.**	(d)	**75.**	(a)	**76.**	(d)	**77.**	(d)	**78.**	(c)
79.	(b)	**80.**	(a)	**81.**	(b)	**82.**	(b)	**83.**	(b)	**84.**	(a)
85.	(c)	**86**	(a)	**87.**	(a)	**88.**	(a)				

CHAPTER-3
EQUATIONS
HOME WORK

1. Solution of the equations is $x - y = -2$ & $2x + 3y = 36$ is
   (a) 6, 8　　　(b) 8, 6　　　(c) 3, 5　　　(d) none

2. The value of x and y in $x + y = 7$ and $3x - 2y = 11$ is
   (a) 2, 5　　　(b) 5, 2　　　(c) 3, 4　　　(d) None

3. The value of x and y in $3x + 2y = 11$ and $2x + 3y = 4$ is
   (a) 2, 5　　　(b) 5, 2　　　(c) 5, -2　　　(d) none

4. The graphs of the equation $3x + 2y = 5$ and $2x - y = 11$ are
   (a) intersecting　(b) parallel　　(c) coincident　(d) none

5. The graphs of the equation $3x + 6y = 9$ and $9x + 18y = 27$ are
   (a) intersecting　(b) parallel　　(c) coincident　(d) none

6. The graphs of the equation $4x - 5y = 7$ and $8x - 10y = 9$ are
   (a) intersecting　(b) parallel　　(c) coincident　(d) none

7. The value of p for which graphs of $2x + py = 7$ and $4x + 2y = 14$ are coincident
   (a) 1　　　(b) 2　　　(c) 7　　　(d) none

8. The system of equation $5x - 4y = 7$ and $3x - 2y = 15$ have
   (a) unique solution　　(b) infinite solution
   (c) no solution　　　　(d) none

9. The system of equation $9x - 17y = 34$ and $36x - 68y = 115$ have
   (a) unique Solution　　(b) infinite Solution
   (c) no solution　　　　(d) none

10. The price of 9 pencils and 5 pens is ₹ 90. Whereas the price of 5 pencils and 4 pens is ₹ 61. The price of 6 pencils and 3 pens is
    (a) ₹ 55　　　(b) ₹ 57　　　(c) ₹ 55　　　(d) none

11. If 4 is added to the numerator of a fraction the fraction becomes equal to 1. If 1 is subtracted from the denominator, the fraction becomes equal to $\frac{1}{2}$. The fraction is

    (a) $\frac{7}{3}$　　(b) $\frac{3}{8}$　　(c) $\frac{3}{7}$　　(d) none

12. The income of two persons are in the ratio 9 : 7 and their expenditure are in the ratio 4 : 3. If both of them save ₹ 200 per month. Find the monthly income of both.
(a)   ₹1700, ₹ 1200   (b)   ₹ 1600, ₹ 1200
(c)   ₹ 1800, ₹ 1400   (d)   none

13. If 4 is added to the numerator of a fraction the fraction becomes equal to $\frac{1}{2}$. If 5 is subtracted from the denominator. The fraction becomes equal to $\frac{1}{3}$. The fraction is
(a) $\frac{14}{5}$ (b) $\frac{3}{14}$ (c) $\frac{3}{11}$ (d)   none

14. There are two numbers. If we add one to each number their ratio becomes 2 : 3. If 1 be decreased from each no. their ratio become 1 : 2. The numbers are
(a)   3, 1   (b)   1, 3   (c)   1, 5   (d)   none

15. A father's age is equal to the ages of 5 children. In fifteen years, his age will be only half of their united age. Find his present age.
(a)   40 years   (b)   45 years   (c)   42 years   (d)   none

16. The roots of equation $x^2 - 6x + 8 = 0$ are
(a) ± 2 (b)   4, 2   (c)   3, 1   (d)   none

17. The value of c for which the equation $2x^2 - 9x + c = 0$ have equal roots
(a) $\frac{81}{8}$ (b) $\frac{8}{81}$ (c)   9   (d)   none

18. The positive value of m for $6x^2 - mx + 5 = 0$ have roots in the ratio 1 : 2 is
(a) $15\sqrt{3}$ (b) $3\sqrt{15}$ (c) $\sqrt{15}$ (d)   none

19. The quadratic equation whose roots are $3 + \sqrt{5}$ and $3 - \sqrt{5}$ is
(a) $x^2 - 6x + 2 = 0$ (b) $x^2 - 4x + 6 = 0$
(c) $x^2 - 6x + 4 = 0$ (d)   none

20. The quadratic equation whose one of the roots is $6 + \sqrt{11}$
(a) $x^2 - 12x + 25 = 0$ (b) $x^2 - 25x + 12 = 0$
(c) $x^2 - 18x + 15 = 0$ (d)   none

21. Factor of $x^2 + 4\sqrt{2}\,x + 6$ are
(a) $(x + 3\sqrt{2})\,(x + \sqrt{2})$ (b) $(x + \sqrt{2})\,(x + \sqrt{3})$
(c) $(x + 2\sqrt{2})\,(x - 2\sqrt{3})$ (d) none

22. Factor of $x^2 - 2x - 6$ are

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

(c) $(x + 2 + \sqrt{2})(x + 2 - \sqrt{2})$ (d)   none

23. The roots in $x^4 - 26x^2 + 25 = 0$ are

(a) $\pm 1, \pm 5$ (b) $\pm 1, \pm 3$ (c) $\pm 2, \pm 5$ (d)   none

24. The roots of $2x + \dfrac{4}{x} = 9$ are

(a)   4, 2   (b)   4, 3   (c)   4, $\dfrac{1}{2}$ (d)   none

25. Value of x in $\sqrt{x} + 2x = 1$ is

(a)   4   (b) $\dfrac{1}{4}$ (c)   2   (d)   none

26. In $6\left(x^2 + \dfrac{1}{x^2}\right) - 25\left(x - \dfrac{1}{x}\right) + 12 = 0$. The value of x are

(a)   3, 4, 5, 6   (b) $3, \dfrac{1}{3}, 2, \dfrac{1}{2}$ (c) $3, -\dfrac{1}{3}, 2 - \dfrac{1}{2}$ (d)   none

27. Product of Anokhi age five year ago to her age after 9 year is 51. The present age of Anokhi is

(a)   9 year   (b)   8 year   (c)   7 years   (d)   none

28. The sides of a right triangle containing the right angle are $4x$ and $5x - 4$. If the area of triangle is 210 m^2. Find the sides of triangle

(a)   8, 15, 17   (b)   20, 21, 29   (c)   3, 4, 5   (d)   None

29. The sum of squares of two consecutive natural numbers is 841. The smaller number is

(a)   20   (b)   21   (c)   19   (d)   none

30. A fast train takes 30 hour less than a slow train for a journey of 600 km. If the speed of slow train is 10 km/h less than that of the fast train. Find the speed of fast train.

(a)   20   (b)   30   (c)   40   (d)   none

31. In a cricket match Anil took one wicket more than the thrice the number of wicket taken by Sachin. If the product of the number of wickets taken by both is 14. Find the number of wickets taken by Sachin.

    (a)   3   (b)   7   (c)   2   (d)   none

32. If α and β are the roots of the quadratic equation $ax^2 + bx + c = 0$. The value of $\alpha^3 + \beta^3$ is

    (a) $\dfrac{3\,abc - b^3}{a^3}$ (b) $\dfrac{3\,abc - a^3}{c^3}$ (c) $\dfrac{3\,abc - c^3}{a^3}$ (d) none

33. If α and β are the roots of the equal square. $ax^2 + bx + c = 0$. Then the value of $\alpha^2 + \beta^2$ is

    (a) $\dfrac{b^2 - ac}{a^2}$ (b) $\dfrac{b^2 - 2ac}{a^2}$ (c) $\dfrac{b^2 - a^2}{a^2}$ (d) none

34. $x = 4$ is a solution of the equation $3x^2 + (k - 1)\, x + 16 = 0$ if k has value :

    (a)   17   (b)   −17   (c)   15   (d)   −15

35. The quadratic polynomial in x whose zeros are $a, 2a$ is :

    (a) $(x + a)\,(x - 2a)$ (b) $(x - 2a)\,(x + 2a)$
    (c) $(x + a)\,(x + 2a)$ (d) $(x - a)\,(x - 2a)$

36. The solution of $2 - x = \dfrac{x - 2}{x}$ would include :

    (a)   −2, -1   (b)   2, -1   (c)   −4, 2   (d)   4, -2

37. The common root of the equations $x^2 - 7x + 10 = 0$ and $x^2 - 10x + 16 = 0$ is :

    (a)   −2   (b)   3   (c)   5   (d)   2

38. If the product of the roots of $x^2 - 3x + k = 10$ is −2 the value of k is :

    (a)   −2   (b)   8   (c)   12   (d)   −8

39. If one root of the equation $2x^2 - ax + 6 = 0$ is 2 then a equals :

    (a)   7   (b) $\dfrac{7}{2}$ (c) -7 (d) $-\dfrac{7}{2}$

40. The ratio of the sum and the product of the roots of $7x^2 - 12x + 18 = 0$ is :

    (a)   7 : 12   (b)   2 : 3   (c)   3 : 2   (d)   7 : 18

41. The roots of $2x^2 - 6x + 3 = 0$ are :

    (a)   real, unequal and rational (b)   real, unequal and irrational
    (c)   real and equal   (d)   imaginary

42. The equation $x^2 + 4x + k = 0$ has real roots. Then :
(a) $k \geq 4$.   (b) $k \leq 4$ (c) $k \leq 0$ (d) $k \geq 0$

43. Roots of $ax^2 + b = 0$ are real and distinct if
(a) $ab > 0$ (b) $ab < 0$ (c) $a, b > 0$ (d) $a, b < 0$

44. If $log_{10}(x^2 - 6x + 45) = 2$, then the values of x are :
(a)   6, 9   (b)   –7, 2   (c)   10, 5   (d)   11, -5

45. The roots of $\dfrac{x+4}{x-4} + \dfrac{x-4}{x+4} = \dfrac{10}{3}$ are :

(a) ± 4 (b) ± 6 (c) ± 8 (d) $2 \pm \sqrt{3}$

46. If the ratio between the roots of the equations $lx^2 + nx + n = 0$ is $p : q$, then the

value of $\sqrt{\dfrac{p}{q}} + \sqrt{\dfrac{q}{p}} + \sqrt{\dfrac{n}{l}}$ is :

(a) 1   (b) 3   (c) 0   (d) –1

47. The value of in the equation $\sqrt{\dfrac{x}{1-x}} + \sqrt{\dfrac{1-x}{x}} = 2\dfrac{1}{6}$ is :

(a) $\dfrac{5}{13}$ (b) $\dfrac{7}{13}$ (c) $\dfrac{9}{13}$ (d)   None

48. The value of x in the equation $8\left(x^2 + \dfrac{1}{x^2}\right) - 42\left(x - \dfrac{1}{x}\right) + 29 = 0$ is :

(a)   4   (b)   –2   (c) $\dfrac{1}{2}$ (d) $\dfrac{1}{4}$

49. The value of x in the equation $\sqrt{4x-3} + \sqrt{2x+3} = 6$ is :
(a)   3   (b)   1   (c)   100   (d)   111

50. The roots of the equation $4^x - 3\left(2^{x+2}\right) + 32 = 0$ would include :
(a)   1, 2 & 3   (b)   1 & 2   (c)   1 & 3   (d)   2 & 3

51. The solution set of the equation $5^{x+1} + 5^{2-x} = 126$ is :
(a) $\{1,2\}$ (b) $\{-1,2\}$ (c) $\{1,-2\}$ (d) $\{-1,-2\}$

52. The sum of a number and its reciprocal is $2\dfrac{1}{20}$. The number is :

(a) $\dfrac{5}{4}$ (b) $\dfrac{3}{4}$ (c) $\dfrac{4}{3}$ (d) $\dfrac{1}{6}$

53. Solving equation $z^2 - 6z + 9 = 4\sqrt{z^2 - 6z + 6}$ following following roots are obtained

(a) $3 + 2\sqrt{3}, 3 - 2\sqrt{3}$ (b)   5, 1

(c)   all the above   (d)   None

54. Solving equation $(2x+1) (2x+3) (x-1) (x-2) = 150$ the roots available are

(a) $\dfrac{1 \pm \sqrt{129}}{4}$ (b) $\dfrac{7}{2}, -3$ (c) $-\dfrac{7}{2}, 3$ (d)   None

55. Solving equation $(2x+3) (2x+5) (x-1) (x-2) = 30$ the roots available are

(a) $0, {}^{1}/_{2}, -{}^{11}/_{4}, {}^{9}/_{4}$ (b) $0, -\dfrac{1}{2}, \dfrac{-1 \pm \sqrt{105}}{4}$

(c) $0, -\dfrac{1}{2}, -\dfrac{11}{4}, \dfrac{9}{4}$ (d)   None

56. Solving equation $\sqrt{y^2 + 4y - 21} + \sqrt{y^2 - y - 6} = \sqrt{6y^2 - 5y - 39}$ following roots are obtained

(a)   2, 3, 5/3   (b)   2, 3, -5/3   (c)   -2, -3, 5/3   (d)   -2, -3, -5/3

ANSWERS

1.	(a)	2.	(b)	3.	(c)	4.	(a)	5.	(c)	6.	(b)	7.	(a)
8.	(a)	9.	(c)	10.	(b)	11.	(c)	12.	(c)	13.	(b)	14.	(d)
15.	(b)	16.	(b)	17.	(a)	18.	(b)	19.	(c)	20.	(a)	21.	(a)
22.	(d)	23.	(a)	24.	(c)	25.	(b)	26.	(c)	27.	(b)	28.	(b)
29.	(a)	30.	(a)	31.	(c)	32.	(a)	33.	(b)	34.	(d)	35.	(d)
36.	(b)	37.	(d)	38.	(b)	39.	(a)	40.	(b)	41.	(b)	42.	(b)
43.	(b)	44.	(d)	45.	(c)	46.	(c)	47.	(c)	48.	(a)	49.	(a)
50.	(d)	51.	(b)	52.	(a)	53.	(c)	54.	(a)	55.	(b)	56.	(b)

CHAPTER-4
CO-ORDINATE GEOMETRY
HOME WORK

1. The points (-3 4), (2, 4) and (1, 2) are the vertices of a triangle which is
   (a) right angled (b) isosceles (c) equilateral (d) other

2. The points (2, 3), (-5, 2) and (-6, -9) are the vertices of a triangle which is
   (a) right angled   (b) isosceles
   (c) equilateral   (d) other

3. The points (2, 3), (-5, 2) and (-4, 9) are the vertices of a triangle which is
   (a) right angled   (b) isosceles
   (c) equilateral   (d) other

4. The points (2, 7), (5, 3) and (-2, 4) are the vertices of a triangle which is
   (a) right angled   (b) isosceles
   (c) equilateral   (d) isosceles and right angled

5. The points (1, -1) ($-\sqrt{3}, -\sqrt{3}$) and (-1, 1) are the vertices of a triangle which is
   (a) right angled   (b) isosceles
   (c) equilateral   (d) other

6. The co-ordinates of the circumcentre of a triangle with vertices $(3, -2)$ $(-6, 5)$ and $(4, 3)$ are
   (a) $(-\frac{3}{2}, \frac{3}{2})$ (b) $(\frac{3}{2}, -\frac{3}{2})$ (c) (-3, 3) (d) (3, -3)

7. The centroid of a triangle with vertices (1, -2) (-5, 3) and (7, 2) is given by
   (a) (0, 0) (b) (1, -1) (c) (-1, 1) (d) (1, 1)

8. The ratio in which the point (11, -3) divides the joint of points (3, 4) and (7, 11) is
   (a) 1:1 (b) 2:1 (c) 3:1 (d) None

9. The area of a triangle with vertices (1, 3) (5, 6) and (-3, 4) in terms of square units is
   (a) 5 (b) 3 (c) 8 (d) 13

10. The area of a triangle with vertices (0, 0) (1, 2) and (-1, 2) is
(a)   2   (b)   3   (c)   1   (d)   None

11. The area of the triangle with vertices (4, 5) (1, -1) and (2, 1) is
(a)   0   (b)   1   (c)   -1   (d)   None

12. The area of the triangle with vertices (*p, q+r*) (*q, r+ p*) and (*r, p+q*) is
(a)   0   (b)   1   (c)   -1   (d)   None

13. Points (p, 0) (0, q) and (1, 1) are collinear if
(a) $1/p + 1/q = 1$ (b) $1/p - 1/q = 1$

(c) $1/p + 1/q = 0$ (d) $1/p - 1/q = 0$

14. The equation of the line passing through points (1, -1) and (-2, 3) is given by
(a)   4x+3y-1=0   (b)   4x+3y+1=0
(c)   4x-3y-1=0   (d)   4x-3y+1=0

15. The equation of the line passing through (2, -2) and the point of intersection of 2x+3y-5=0 and 7x-5y-2=0 is
(a)   3x-y-4=0   (b)   3x+y-4=0   (c)   3x+y+4=0   (d)   None

16. The equation of the line passing through the point of intersection of 2x+3y-5=0 and 7x-5y-2=0 and parallel to the lines 2x-3y+14=0 is
(a)   2x-3y+1=0   (b)   2x-3y-1=0   (c)   3x+2y+1=0   (d)   3x+2y-1=0

17. The equation of the line passing through the point of intersection of 2x+3y-5=0 and 7x-5y-2=0 and perpendicular to the lines 2x-3y+14=0 is
(a)   3x+2y+5=0   (b)   3x+2y-5=0   (c)   2x-3y+5=0   (d)   2x-3y-5=0

18. The lines x-y-6=0 , 6x+5y+8=0 and 4x-3y-20=0 are
(a)   Concurrent   (b)   Non Concurrent
(c)   Perpendicular to each other   (d)   Parallel to each other

19. The lining joining (-1, 1) and (2, -2) and the line joining (1, 2) and (2, *k*) are parallel to each other for the following value of *k*
(a)   1   (b)   0   (c)   -1   (d)   None

20. The lining joining (-1, 1) and (2, -2) and the line joining (1, 2) and (2, k) are perpendicular to each other for the following value of k
   (a) 1   (b) 0   (c) -1   (d) 3

21. A factory products 300 units and 900 units at a total cost of ₹ 6800/- and ₹10400/- respectively. The liner equation of the total cost line is
   (a) y=6x+1,000   (b) y=5x+5,000
   (c) y=6x+5,000   (d) None

22. If an investment of ₹ 1000 and ₹100 yield an income of ₹ 90 ₹ 20 respectively for earning ₹ 50 investment of ₹ _____will be required.
   (a) less than ₹ 500   (b) over ₹ 500   (c) ₹ 485   (d) ₹ 486

23. If an investment of ₹ 60000 and ₹ 70000 respectively yields an income of ₹ 5750 ₹ 6500 an investment of ₹ 90000 would yield income of ₹_____.
   (a) 7500   (b) 8000   (c) 7750   (d) 7800

ANSWERS

1.	(a)	**2.**	(d)	**3.**	(b)	**4.**	(d)	**5.**	(c)	**6.**	(a)
7.	(d)	**8.**	(b)	**9.**	(c)	**10.**	(a)	**11.**	(a)	**12.**	(a)
13.	(a)	**14.**	(a)	**15.**	(b)	**16.**	(a)	**17.**	(b)	**18.**	(a)
19.	(a)	**20.**	(d)	**21.**	(c)	**22.**	(d)	**23**	(b)		

CHAPTER-5
LINEAR INEQUALITIES

1. 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) $y \geq x/5$ (b) $5y \leq x$
   (c) $5y \geq x$ (d) Both (a) and (c)

2. The union however forbids him to employ less than 2 experienced person to each fresh person. This situation can be expressed as
   (a) $x \leq y/2$ (b) $y \leq x/2$ (c) $y \geq x/2$ (d) $x > 2y$

ANSWERS

1.	(d) Both (a) and (c)	2.	(b)

CHAPTER-6

SEQUENCES AND SERIES (PROGRESSIONS)
HOME WORK

1. $3+5+7...up\,to\ n\ terms = ...$

    (a) n^2 (b) $(n+1)^2$ (c) $n^2 + 2n$ (d)   none of (a),(b),(c)

2.   (-49) +(-47)+(-45) + ...up to 49 terms.

    (a)   0   (b)   - 49   (c)   49   (d)   none of (a),(b),(c)

3.   50+48+46+............up to 51 terms = ...

    (a)   0   (b)   - 50   (c)   50   (d)   none of (a),(b),(c)

4.   The sum of first 10 terms of an A.P. is   100 and the sum of first 20 terms is   400 then the sum of first 30 terms is   ....

    (a)   500   (b)   900   (c)   700   (d)   none of (a),(b),(c)

5.   If the nth terms of an A.P. is m then the sum of first $2n$ -1 terms is ....

    (a) $m(2n-1)$ (b) $m(2n+1)$

    (c) $\dfrac{m}{2}(2n-1)$ (d)   none of (a),(b),(c)

6   If the sum of first n terms of an A.P. is equal to the sum of first m terms , then the sum of first $m + n$ terms of the A.P. is ....

    (a) $m + n$ (b)   0   (c) $\dfrac{m+n}{2}$ (d)   none of (a),(b),(c)

7.   If the mth term of an A.P. is $\dfrac{1}{n}$ and the nth term is $\dfrac{1}{m}$ then its $(mn)^{th}$ term is......

    (a)   1   (b)   0   (c)   (d)   none of (a),(b),(c)

8.   If the ratio of the sum of m terms and sum of n terms of an A.P. is $\dfrac{m^2}{n^2}$, then the ratio of their m^{th} and n^{th} terms is ....

    (a) $\dfrac{2m-1}{2n-1}$ (b) $\dfrac{2m+1}{2n+1}$ (c) $\dfrac{m}{n}$ (d)   none of (a),(b),(c)

9.   If for two A.P.s the ratio of their sum of n terms is $\dfrac{2n+1}{3n-1}$ then the ratio

of their fifth terms is ....

(a) $\dfrac{17}{25}$ (b) $\dfrac{19}{26}$ (c) $\dfrac{21}{29}$ (d)   none of (a),(b),(c)

10. If for an A.P. the sum of its first m terms is n and the sum of its first n terms is m then the sum of first $m + n$ terms is ....
(a) $m + n$ (b)   0   (c) $-(m + n)$ (d)   none of (a),(b),(c)

11. If the mth term of an A.P. is $\dfrac{1}{n}$ and the nth term is $\dfrac{1}{m}$ then the sum of its

first mn terms is ....

(a) $\dfrac{1}{mn}$ (b) $\dfrac{1}{2}(mn-1)$ (c) $\dfrac{1}{2}(mn+1)$ (d)   none of (a),(b),(c)

12. The sum of any finite number of terms of G.P. $1+\dfrac{1}{2}+\dfrac{1}{4}+$............ is..............

(a)<2   (b)   >2   (c)   2 (d)   none of (a),(b),(c)

13. The sum of any finite number of terms of G.P. $1+\dfrac{1}{3}+\dfrac{1}{9}+$............ is..............

(a)$<\dfrac{3}{2}$ (b) $>\dfrac{3}{2}$ (c) $\dfrac{3}{2}$ (d)   none of (a),(b),(c)

14. The least value of n such that $1+3+3^2+3^3+$.........$up\ to\ n\ terms > 7000$ is ....
(a)   8   (b)   9   (c)   10   (d)   none of (a),(b),(c)

15. The greatest value of n such that $\dfrac{1}{2}+\dfrac{1}{4}+$........$to\ n\ terms <.999$ is
(a)   8   (b)   9   (c)   10   (d)   none of (a),(b),(c)

16. In a G.P. $(p + q)^{th}$ term is m and $(p - q)^{th}$ term is n then its pth term is ....

(a) mn (b) $\sqrt{mn}$ (c) $\sqrt{m/n}$ (d)   none of (a),(b),(c)

17. If $x=1+a+a^2+$......∞ , $y=1+b+b^2+$......∞ then $1+ab+a^2b^2+$..........∞
=......

(a) xy (b) $\dfrac{xy}{xy-1}$ (c)$\dfrac{xy}{x+y-1}$ (d)   none of (a),(b),(c)

(18. If sum to infinity of G.P. $p, 1, \dfrac{1}{p}, \ldots\ldots\ldots\infty$ is $\dfrac{25}{4}$ then $p = \ldots\ldots$

    (a)   5   (b)   5/4   (c)   5 or 5/4   (d)   none of (a),(b),(c)

19. If the pth, q^{th} and r^{th} terms of a G.P. be x, y and z respectively then

$$x^{q-r} y^{r-p} z^{p-q} = \ldots\ldots\ldots\ldots$$

    (a)   0   (b)   1   (c)   2   (d)   none of (a),(b),(c)

20. If the nth terms of G.P. 1280,640,320,....... and 5,10,20,.....be same then$n = \ldots\ldots$

    (a)   5   (b)   9   (c)   7   (d)   none of (a),(b),(c)

21. A tennis ball when dropped to the ground rebounds to half of its height from which it falls. It is dropped from a height of 16 meters .Then the total distance traveled by the ball when it rests on the ground is

    (a)   48 m   (b)   32 m   (c)   64   m   (d) $47\dfrac{15}{16}$ m

22. The sum of 10 terms of an A. P. is 230 and the sum of its 4 terms is 44, the sum of its 14 terms is

    (a)   344   (b)   434   (c) 343   (d)   none of them

23. The sum of an A. P. is 30. If its common difference and the last term are 2 and 10 respectively, the number of terms are

    (a)   5 or 6   (b)   5 or 7   (c)   6 or 7   (d)   none of them

24. The sum of numbers between 200 and 400 exactly divisible by 7 is

    (a)   8729   (b)   3187   (c)   3287   (d)   none of them

25. The sum of numbers between 1 and 100 which are exactly divisible by 3 or 5 is

    (a)   4285   (b)   3200   (c)   2318   (d)   none of them

26. The 6th term of an A. P. in 121, the sum of its first 11 terms is

    (a)   1210   (b)   1331   (c)   1330   (d)   none of them

27. The sum of 2n terms of the series
1 − 2 + 3 − 6 + 5 − 10 + 7 − 14 + ... is

    (a) $-n^2$ (b) n^2 (c) $-n^3$ (d) n^3

28. The sum of four numbers in A. P. is 20 and the sum of their squares is 120, the product of the numbers is
(a) 1220 (b) 3840 (c) 384 (d) 288

29. The sum of five numbers in A. P. is 15 and the sum of their squares is 55, the product of the numbers is
(a) 100 (b) 120 (c) 240 (d) 50

30. The sum of five numbers in A. P. is 30, and the product of the first and the last is 20, the sum of last two numbers is
(a) 15 (b) 30 (c) 18 (d) 20

31. A class consists of a number of boys whose ages are in A. P. the common difference being 4 months. If the youngest boy of the class be only 8 years old and the sum of the ages of all the boys of the class be 168 years, the number of boys in the class are
(a) 15 (b) 14 (c) 13 (d) 16

32. A class consists of a number of boys whose ages are in A. P. the common difference being 4 months. If the youngest boy of the class be only 8 years old and the sum of the ages of all the boys of the class be 168 years, the age of the eldest boy in the class is
(a) 15 (b) 14 (c) 13 (d) 16

33. A person travels 15 kilometers on a cycle in the first hour and diminishes his speed by $\frac{1}{2}$ kilometer every hour. What time will he take to travel 156 kilometers?
(a) 15 hours (b) 13 hours (c) 14 hours (d) 16 hours

34. The sum of three numbers in G. P. is 35 and their product is 1000, the sum of squares of the numbers is
(a) 500 (b) 512 (c) 525 (d) 550

35. The sum of first four terms of a G. P. is 65 and the sum of its last two terms is 45, the sum of its first and last number is
(a) 45 (b) 51 (c) 44 (d) 35

36. The sum of n terms of the series 2 + 11 + 101 + 1001 ....is
(a) $(10^n - 1) + n$
(b) $(10^{2n} - 1) + n$
(c) $(9)(10^n - 1) + n$
(d) $(1/9)(10^n - 1) + n$

37. If we insert 4 geometric means between 1/2 and 512, the 3rd G.M. is

(a)　　32　(b)　　　16　(c)　　　64　(d)　　　none of them

38. A refrigerator passes through three stages before it reaches to a customer from the manufacturer. At each stage the cost is increased by 10%. If the manufacturer's cost is ₹ 4000, the amount a customer will have to pay for it is

(a)　　5324　(b)　　4400　(c)　4840　(d)　　none of them

39. If a, b, c are in G.P. and x, y by the arithmetic means between a, b and b, c respectively then $a/x + c/y$ is

(a)　　0　　(b)　　2　(c)　　　1　(d)　　　none of them

40. If the arithmetic mean between a and b is twice as large as their geometric mean, the ratio between the numbers can be written as

(a)　　$2 + \sqrt{3} : 2 - \sqrt{3}$　　　(b)　　$2 - \sqrt{3} : 2 + \sqrt{3}$

(c)　　$4 + \sqrt{3} : 4 - \sqrt{3}$　　　(d)　　none of them

41. The arithmetic mean of two positive numbers is _____ to their geometric mean.

(a)　$\geq$　　(b)　　>　(c)　　　$\leq$　(d)　　　<

42. The sum of all 2 digit numbers is :

(a)　　4750　　　(b)　　4905　　　(c)　　3776　　　(d)　　4680

43. If $(k + 1)$, 3k and $(4k + 2)$ be any three consecutive terms of an A.P., then the value of k is :

(a)　　3　　(b)　　0　　(c)　　1　　(d)　　2

44. The sides of a right angled triangle are in A.P. The ratio of sides is :

(a)　　1 : 2 : 3　　(b)　　2 : 3 : 4

(c)　　3 : 4 : 5　　(d)　　5 : 8 : 3

45. If a, b, c are in G.P. and $a^{1/x} = b^{1/y} = c^{1/z}$, then x, y, z are in :

(a)　　A.P.　(b)　　G.P.　(c)　　H.P.　(d)　　None

46. $6^{1/2} \cdot 6^{1/4} \cdot 6^{1/8} \ldots \infty = ?$

(a)　　6　　(b)　　　∞　　(c)　　216　(d)　　36

47. $1 - \dfrac{1}{3} + \dfrac{1}{3^2} - \dfrac{1}{3^3} + \ldots \infty = ?$

     (a) $\dfrac{1}{2}$ (b) $\dfrac{1}{6}$ (c) $\dfrac{3}{4}$ (d) $\dfrac{4}{9}$

48.   The tenth term of the series $\sqrt{3}, \sqrt{12}, \sqrt{27}, \ldots\ldots\ldots$

     (a)   510   (b) $\sqrt{200}$ (c) $\sqrt{300}$ (d) $\sqrt{312}$

49.   The sum of the series $1^2 + 1 + 2^2 + 2 + 3^2 + 3 + \ldots\ldots\ldots + n^2 + n$ is equal to

     (a) $\dfrac{7n^2 + n^3}{14}$ (b) $\dfrac{8n^2 + 9n + 6}{2}$

     (c) $\dfrac{5n^3 + 9n^2 + 9n}{6}$ (d) $\dfrac{6n^2 + 7n}{8}$ (e)$\dfrac{n(n+1)(n+2)}{3}$

50.   The nth element of the sequence –1, 2, –4, 8 ….. is

     (a) $(-1)^n 2^{n-1}$ (b) 2^{n-1} (c) 2^n (d)   none of these

51.   The number of the terms of the series $10 + 9\dfrac{2}{3} + 9\dfrac{1}{3} + 9 + \ldots\ldots\ldots$will amount to 155 is

     (a)   30   (b)   31   (c)   32   (d)   (a) and (b) both

52.   The two arithmetic means between –6 and 14 is

     (a)   2/3, 1/3   (b) $2/3, 7\dfrac{1}{3}$ (c) $-2/3, -7\dfrac{1}{3}$ (d)   none of these

53.   The pth term of an AP is (3p – 1)/6. The sum of the first n terms of the AP is

     (a)   n (3n + 1)   (b)   n/12 (3n + 1)

     (c)   n/12 (3n – 1)   (d)   none of these

54.   The first term of an A.P is 14 and the sums of the first five terms and the first ten terms are equal is magnitude but opposite in sign. The 3rd term of the AP is

     (a) $6\dfrac{4}{11}$ (b)   6   (c)   4/11   (d)   none of these

55.   The sum of the series $\dfrac{1}{\sqrt{3}} + 1 + \dfrac{3}{\sqrt{3}}$ ……to 18 terms is

     (a) $9841\dfrac{(1+\sqrt{3})}{\sqrt{3}}$ (b)   9841   (c) $\dfrac{9841}{\sqrt{3}}$ (d)   none of these

56.   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

ANSWERS

1.	(c)	**2.**	(b)	**3.**	(a)	**4.**	(b)	**5.**	(a)	**6.**	(b)	**7.**	(a)
8.	(a)	**9.**	(b)	**10.**	(c)	**11.**	(c)	**12.**	(a)	**13.**	(a)	**14.**	(b)
15.	(b)	**16.**	(b)	**17.**	(c)	**18.**	(c)	**19.**	(b)	**20.**	(a)	**21.**	(a)
22.	(b)	**23.**	(a)	**24.**	(a)	**25.**	(c)	**26.**	(b)	**27.**	(a)	**28.**	(c)
29.	(b)	**30.**	(c)	**31.**	(d)	**32.**	(c)	**33.**	(b)	**34.**	(c)	**35.**	(d)
36.	(d)	**37.**	(a)	**38.**	(a)	**39.**	(b)	**40.**	(a)	**41.**	(a)	**42.**	(b)
43.	(a)	**44.**	(c)	**45.**	(a)	**46.**	(a)	**47.**	(c)	**48.**	(c)	**49.**	(e)
50.	(a)	**51.**	(d)	**52.**	(b)	**53.**	(b)	**54.**	(a)	**55.**	(a)	**56.**	(a)

CHAPTER-7
MATHEMATICS OF FINANCE
HOME WORK

1. A machine is depreciated at the rate of 20% on reducing balance. The original cost of the machine was ₹ 100000 and its ultimate scrap value was ₹ 30000. The effective life of the machine is
(a)   4.5 years (appx.)   (b)   5.4 years (appx.)
(c)   5 years (appx.)   (d)   none of these

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

3. The population of a town increases every year by 2% of the population at the beginning of that year. The number of years by which the total increase of population be 40% is
(a)   7 years   (b)   10 years
(c)   17 years (app)   (d)   none of these

4. The useful life of a machine is estimated to be 10 years and cost ₹ 10000. Rate of depreciation is 10% p.a. The scrap value at the end of its life is
(a)   ₹ 3486   (b)   ₹ 4383   (c)   ₹ 3400   (d)   none of these

5. The annual birth and death rates per 1000 are 39.4 and 19.4 respectively. The number of years in which the population will be doubled assuming there is no immigration or emigration is
(a)   35 yrs.   (b)   30 yrs.   (c)   25 yrs   (d)   none of these

6. The C.I on ₹ 4000 for 6 months at 12% p.a payable quarterly is
(a)   ₹ 243.60   (b)   ₹ 240   (c)   243   (d)   none of these

7. The amount of an annuity certain of ₹ 150 for 12 years at 3.5% p.a C.I is
(a)   ₹ 2190.28   (b)   ₹ 1290.28   (c)   ₹ 2180.28   (d)   none of these

8. A loan of ₹ 10,000 is to be paid back in 30 equal installments. The amount of each installment to cover the principal and at 4% p.a CI is
(a)   ₹ 587.87   (b)   ₹ 587   (c)   ₹ 578.3   (d)   478.3

9. A company borrows ₹ 10000 on condition to repay it with compound interest at 5% p.a by annual installments of ₹ 1000 each. The number of years by which the debt will be clear is
(a)   14.2 yrs.   (b)   10 yrs.   (c)   12 yrs.   (d)   none of these

10. Mr. Paul borrows ₹ 20000 on condition to repay it with C.I. at 5% p.a in annual installments of ₹ 2000 each. The number of years for the debt to be paid off is
(a)   10 yrs.   (b)   12 yrs.   (c)   11 yrs.   (d)   none of these

11. A person invests ₹ 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)   ₹ 11761.3   (b)   ₹ 10000   (c)   ₹ 12000   (d)   none of these

12. A person bought a house paying ₹ 20000 cash down and ₹ 4000 at the end of each year for 25 yrs. at 5% p.a. C.I. The cash down price is
(a)   ₹ 75000   (b)   ₹ 76000   (c)   ₹ 76375.77   (d)   none of these.

13. A man purchased a house valued at ₹ 300000. He paid ₹ 200000 at the time of purchase and agreed to pay the balance with interest at 12% per annum compounded half yearly in 20 equal half yearly installments. If the first installment is paid after six months from the date of purchase then the amount of each installment is [Given log 10.6 = 1.0253 and log 31.19 = 1.494]
(a)   ₹ 8719.66   (b)   ₹ 8769.21
(c)   ₹ 7893.13   (d)   none of these.

14. The difference between compound and simple interest at 5% per annum for 4 years on ₹ 20000is ₹ _____
(a)   250   (b)   277   (c)   300   (d)   310

15. The compound interest on half-yearly rests on ₹ 10000 the rate for the first and second years being 6% and for the third year 9% p.a. is ₹_____.
(a)   2200   (b)   2287   (c)   2285   (d)   2291

16. The present value of ₹ 10000 due in 2 years at 5% p.a. compound interest when the interest is paid on yearly basis is ₹_____.
(a)   9070   (b)   9000   (c)   9061   (d)   None

17. The present value of ₹ 10000 due in 2 years at 5% p.a. compound interest when the interest is paid on half-yearly basis is Rs._____.
   (a)   9070   (b)   9069   (c)   9061   (d)   None

18. Johnson left ₹ 100000 with the direction that it should be divided in such a way that his minor sons Tom, Dick and Harry aged 9, 12 and 15 years should each receive equally after attaining the age 25 years. The rate of interest being 3.5%, how much each son receive after getting 25 years old?
   (a)   50000   (b)   51994   (c)   52000   (d)   51948

19. In how many years will a sum of money double at 5% p.a. compound interest?
   (a)   15 years 3 months   (b)   14 years 2 months
   (c)   14 years 3 months   (d)   15 years 2 months

20. In how many years a sum of money trebles at 5% p.a. compound interest payable on halfyearly basis?
   (a)   18 years 7 months   (b)   18 years 6 months
   (c)   18 years 8 months   (d)   22 years 3 months

21. A machine depreciates at 10% of its value at the beginning of a year. The cost and scrap value realized at the time of sale being ₹ 23240 and ₹ 9000 respectively. For how many years the machine was put to use?
   (a)   7 years   (b)   8 years   (c)   9 years   (d)   10 years

22. A machine worth ₹ 490740 is depreciated at 15% on its opening value each year. When its value would reduce to ₹ 200000?
   (a)   4 years 6 months   (b)   4 years 7 months
   (c)   4 years 5 months   (d)   5 years 7 months approximately

23. A machine worth ₹ 490740 is depreciated at 15% of its opening value each year. When its value would reduce by 90%?
   (a)   11 years 6 months   (b)   11 years 7 months
   (c)   11 years 8 months   (d)   14 years 2 months approximately

24. Alibaba borrows ₹ 6 lakhs Housing Loan at 6% repayable in 20 annual installments commencing at the end of the first year. How much annual payment is necessary.
   (a)   52420   (b)   52419   (c)   52310   (d)   52320

25. A sinking fund is created for redeeming debentures worth ₹ 5 lakhs at the end of 25 years. How much provision needs to be made out of profits each year provided sinking fund investments can earn interest at 4% p.a.?
(a)   12006   (b)   12040   (c)   12039   (d)   12035

26. A machine costs ₹ 520000 with an estimated life of 25 years. A sinking fund is created to replace it by a new model at 25% higher cost after 25 years with a scrap value realization of ₹25000. What amount should be set aside every year if the sinking fund investments accumulate at 3.5% compound interest p.a.?
(a)   16000   (b)   16500   (c)   16050   (d)   16005

27. Raja aged 40 wishes his wife Rani to have Rs.40 lakhs at his death. If his expectation of life is another 30 years and he starts making equal annual investments commencing now at 3% compound interest p.a. how much should he invest annually?
(a)   84448   (b)   84450   (c)   84449   (d)   84077

28. Appu retires at 60 years receiving a pension of 14400 a year paid in half-yearly installments for rest of his life after reckoning his life expectation to be 13 years and that interest at 4% p.a. is payable half-yearly. What single sum is equivalent to his pension?
(a)   145000   (b)   144871   (c)   144800   (d)   144700

ANSWERS

1.	(b)	2.	(a)	3.	(c)	4.	(a)	5.	(a)	6.	(a)	7.	(a)
8.	(c)	9.	(a)	10.	(d)	11.	(a)	12.	(c)	13.	(a)	14.	(d)
15.	(d)	16.	(a)	17.	(c)	18.	(d)	19.	(b)	20.	(d)	21.	(c)
22.	(d)	23.	(d)	24.	(c)	25.	(a)	26.	(c)	27.	(d)	28.	(b)

CHAPTER-8
PERMUTATIONS
HOME WORK

1. 10 examination papers are arranged in such a way that the best and worst papers never come together. The number of arrangements is
(a) $9\lfloor 8$ (b) $\lfloor 10$ (c) $8\lfloor 9$ (d) none of these

2. n articles are arranged in such a way that 2 particular articles never come together. The number of such arrangements is
(a) $(n–2)\lfloor n-1$ (b) $(n–1)\lfloor n-2$ (c) $\lfloor n$ (d) none of these

3. The sum of all 4 digit number containing the digits 2, 4, 6, 8, without repetitions is
(a) 133330 (b) 122220 (c) 213330 (d) 133320

4. The number of ways the letters of the word "Triangle" to be arranged so that the word 'angle' will be always present is
(a) 20 (b) 60 (c) 24 (d) 32

5. 3 ladies and 3 gents can be seated at a round table so that any two and only two of the ladies sit together. The number of ways is
(a) 70 (b) 27 (c) 72 (d) none of these

6. The number of arrangements 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

7. The number of permutations of 10 different things taken 4 at a time in which one particular thing never occurs is
(a) 3020 (b) 3025 (c) 3024 (d) none of these

8. The number of numbers lying between 10 and 1000 can be formed with the digits 2,3,4,0,8,9 is
(a) 124 (b) 120 (c) 125 (d) none of these

9. The total number of 9 digit numbers of different digits is
(a) $10\lfloor 9$ (b) $8\lfloor 9$ (c) $9\lfloor 9$ (d) none of these

10. The total number of ways in which six '+' and four '–' signs can be arranged in a line such that no two '–' signs occur together is

(a) $\underline{|7}/\underline{|3}$ (b) $\underline{|6} \times \underline{|7}/\underline{|3}$ (c) 35   (d) none of these

11. 5 persons are sitting in a round table in such way that Tallest Person is always on the right– side of the shortest person; the number of such arrangements is

(a) 6   (b) 8   (c) 24   (d) none of these

12. How many telephones connections may be allotted with 8 digits form the numbers 0 1 2 …….9?

(a) 10^8 (b) 10!   (c) $^{10}C_8$ (d) $^{10}P_8$

13. In how many different ways 3 rings of a lock cannot combine when each ring has digits 0 1 2……9 leading to unsuccessful events?

(a) 999   (b) 10^3 (c) 10!   (d) 997

14. A dealer provides you Maruti Car & Van in 2 body patterns and 5 different colours. How many choices are open to you?

(a) 2   (b) 7   (c) 20   (d) 10

15. In how many ways can 6 boys and 6 girls be seated around a table so that no 2 boys are adjacent?

(a) 4! × 5!   (b) 5! × 6!   (c) $^6P_6$ (d) $5 \times {}^6P_6$

16. In how many ways can 4 Americans and 4 English men be seated at a round table so that no 2 Americans may be together?

(a) 4! × 3!   (b) $^4P_4$ (c) $3 \times {}^4P_4$ (d) $^4C_4$

17. How many numbers higher than a million can be formed with the digits 0445553?

(a) 420   (b) 360   (c) 7!   (d) None

18. The total number of numbers less than 1000 and divisible by 5 formed with 0 1 2…..9 such that each digit does not occur more than once in each number is

(a) 150   (b) 152   (c) 154   (d) None

19. How many four digits numbers can be formed by using 1 2 …..7 which are greater than 3400?

(a) 500   (b) 550   (c) 560   (d) None

20. If there are 50 stations on a railway line how many different kinds of single first class tickets may be printed to enable a passenger to travel from one station to other?

(a)　2500　　　　(b)　2450　　　　(c)　2400　　　　(d)　None

21. How many numbers greater than 23000 can be formed with 1, 2, …..5?

(a)　3024　　　　(b)　60　　　　(c)　78　　　　(d)　90

22. In how many ways can 9 letters be posted in 4 letter boxes?

(a)　4^9　　　　(b)　4^5　　　　(c)　$^9P_4$　　(d)　$^9C_4$

23. If all the permutations of the letters of the word "chalk" are written in a dictionary the rank of this word will be _____.

(a)　30　　　　(b)　31　　　　(c)　32　　　　(d)　None

ANSWERS

1.	(c)	2.	(a)	3.	(d)	4.	(c)	5.	(c)	6.	(b)
7.	(c)	8.	(c)	9.	(c)	10.	(c)	11.	(a)	12.	(a)
13.	(a)	14.	(c)	15.	(b)	16.	(a)	17.	(b)	18.	(c)
19.	(c)	20.	(b)	21.	(d)	22.	(a)	23.	(c)		

CHAPTER-9
COMBINATIONS
HOME WORK

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 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

3. If $^nc_{10} = {}^nc_{14}$, then $^{25}c_n$ is
   (a) 24 (b) 25 (c) 1 (d) none of these

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

5. 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

6. The number of ways in which 9 things can be divided into three groups containing 2,3, and 4 things respectively is
   (a) 1250 (b) 1260 (c) 1200 (d) none of these

7. 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

8. The number of ways in which 15 mangoes can be equally divided among 3 students is
   (a) $\lfloor 15 / \lfloor (5)^4$ (b) $\lfloor 15 / \lfloor (5)^3$ (c) $\lfloor 15 / \lfloor (5)^2$ (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. The Supreme Court has given a 6 to 3 decision upholding a lower court; the number of ways it can give a majority decision reversing the lower court is
(a)   256   (b)   276   (c)   245   (d)   226.

11. A question paper contains 6 questions, each having an alternative.
The number of ways an examine can answer one or more questions is
(a)   720   (b)   728   (c)   729   (d)   none of these

12. 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

13. The results of 8 matches (Win, Loss or Draw) are to be predicted. The number of different forecasts containing exactly 6 correct results is
(a)   316   (b)   214   (c)   112   (d)   none of these

14. The number of different factors the number 75600 has is
(a)   120   (b)   121   (c)   119   (d)   none of these

15. The number of ways a person can contribute to a fund out of 1 ten-rupee note, 1 five rupee note, 1 two-rupee and 1 one rupee note is
(a)   15   (b)   25   (c)   0   (d)   none of these

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

17. 5 letters are written and there are five letter-boxes. The number of ways the letters can be dropped into the boxes, are in each
(a)   119   (b)   120   (c)   121   (d)   none of these

18. Out of 8 different balls taken three at a time without taking the same three together more than once for how many number of times you can select a particular ball?
(a) $^{7}C_2$ (b) $^{8}C_3$ (c) $^{7}P_2$ (d) $^{8}P_3$

19. Out of 10 consonants and 4 vowels how many words can be formed each containing 6 consonant and 3 vowels?
(a) $^{10}C_6 \times {}^{4}C_3$ (b) $^{10}C_6 \times {}^{4}C_3 \times 9!$
(c) $^{10}C_6 \times {}^{4}C_3 \times 10!$ (d)   None

20. The number of words which can be formed with 2 different consonants and 1 vowel out of 7 different consonants and 3 different vowels the vowel to lie between 2 consonants is _____.

(a) $3 \times 7 \times 6$ (b) $2 \times 3 \times 7 \times 6$ (c) $2 \times 3 \times 7$ (d)   None

21. How many combinations can be formed of 8 counters marked 1 2 …8 taking 4 at a time there being at least one odd and even numbered counter in each combination?

(a)   68   (b)   66   (c)   64   (d)   62

ANSWERS

1.	(b)	2.	(a)	3.	(b)	4.	(b)	5.	(b)	6.	(b)	7.	(a)
8.	(b)	9.	(c)	10.	(a)	11.	(b)	12.	(c)	13.	(c)	14.	(c)
15.	(a)	16.	(c)	17.	(b)	18.	(a)	19.	(b)	20.	(a)	21.	(a)

CHAPTER-10
SET THEORY AND RELATION
HOME WORK

1. The number of subsets of the set {2, 3, 5} is
    (a)   3 ,   (b)   8,   (c)   6,   (d)   none of these,

2. The null set is represented by
    (a)   { Φ }   (b)   { 0 }   (c)   Φ   (d)   none of these

3. A = {2, 3, 5, 7} , B { 4, 6, 8, 10} then A ∩ B can be written as
    (a)   { }   (b)   { Φ }   (c)   (AUB)'   (d)   None of these

4. The set {x|0<x<5} represents the set when x may take integral values only
    (a)   {0, 1, 2, 3, 4, 5 }   (b)   {1, 2, 3, 4 }
    (c)   {1, 2, 3, 4, 5 }   (d)   none of these

5. The set {0, 2, 4, 6, 8, 10} can be written as
    (a)   {2x | 0<x <5}   (b)   {x : 0<x<5}
    (c)   {2x : 0≤x≤5}   (d)   none of these

6. The set of cubes of the natural number is
    (a)   a finite set,   (b)   an infinite set,
    (c)   a null set   (d)   none of these

7. {1− (−1)^x} for all integral x is the set
    (a)   {0},   (b)   {2},   (c)   {0,2}   (d)   none of these

8. E is a set of positive even number and O is a set of positive odd numbers, then E ∪O is a
    (a)   set of whole numbers,   (b)   N,
    (c)   a set of rational number,   (d)   none of these

9. If R is the set of positive rational number and E is the set of real numbers then
    (a)   R⊆E,   (b)   R ⊂E   (c)   E ⊂R   (d)   none of these

10. If N is the set of natural numbers and I is the set of positive integers, then
    (a)   N = I,   (b)   N⊂I,   (c)   N⊆I,   (d)   none of these

11. If R is the set of isosceles right angled triangles and I is set of isosceles triangles, then
    (a)   R = I   (b)   R⊃I,   (c)   R ⊂I   (d)   none of these

12. (A∪B)' is equal to
    (a)   (A∩ B)'   (b)   A ∪B'   (c)   A'∩ B',   (d)   none of these

13. (A∩B)' is equal to

(a)   (A' ∪B)'   (b)   A' ∪B'   (c)   A'∩ B',   (d)   none of these

14. A∪E is equal to (E is a superset of A)

(a)   A,   (b) E,   (c)   φ ,   (d)   none of these

15. If A∆ B = (A–B) ∪(B–A) and A = {1, 2, 3, 4}, B = {3,5,7} than A∆B is

(a)   {1, 2, 4, 5, 7}   (b)   {3}

(c)   {1, 2, 3, 4, 5, 7}   (d)   none of these

16. "Is smaller than" over the set of eggs in a box is

(a)   Transitive (T)   (b)   Symmetric (S)

(c)   Reflexive (R)   (d)   Equivalence (E)

17. "Is equal to" over the set of all rational numbers is

(a)   (T)   (b)   (S)   (c)   (R)   (d)   E

18. "has the same father as" …… over the set of children

(a)   R   (b)   S   (c)   T   (d)   none of these

19. "is perpendicular to " over the set of straight lines in a given plane is

(a)   R   (b)   S   (c)   T   (d)   E

20. "is the reciprocal of" …….. over the set of non-zero real numbers is

(a)   S   (b)   R   (c)   T   (d)   none of these

21. "Is the square of" over n set of real numbers is

(a)   R   (b)   S   (c)   T   (d)   none of these

22. In a group of 20 children, 8 drink tea but not coffee and 13 like tea. The number of children drinking coffee but not tea is

(a)   6   (b)   7   (c)   1   (d)   none of these

23. The sets V = {x / x+2=0}, R={x / x^2+2x=0} and S = {x : x^2+x–2=0} are equal to one another if x is equal to

(a)   –2   (b)   2   (c)   ½   (d)   none of these

24.   Given A = {2, 3}, B = {4, 5}, C = {5, 6} then A × (B ∩ C) is
        (a)   {(2, 5), (3, 5)}   (b)   {(5, 2), (5, 3)}
        (c)   {(2, 3), (5, 5)}   (d)   none of these

25.   Following set notations represent: – A⊂B; x ∉A; A⊃B; {0}; A⊄B
        (a)   A is a proper subset of B; x is not an element of A; A contains B; singleton with an only element zero; A is not contained in B
        (b)   A is a proper subset of B; x is an element of A; A contains B; singleton with an only element zero; A is contained in B
        (c)   A is a proper subset of B; x is not an element of A; A does not contains B; contains elements other than zero; A is not contained in B
        (d)   None

26.   Represent the following sets in set notation: – Set of all alphabets in English language, set of all odd integers less than 25, set of all odd integers, set of positive integers x satisfying the equation x2+5x+7=0 : -
        (a)   A={x:x is an alphabet in English}, I={x:x is an odd integer>25}, I={2, 4, 6, 8 ....} I={x: x^2+5x+7=0}
        (b)   A={x:x is an alphabet in English}, I={x:x is an odd integer<25}, I={1, 3, 5, 7 ....} I={x: x^2+5x+7=0}
        (c)   A={x:x is an alphabet in English}, I={x:x is an odd integer £ 25}, I={1, 3, 5, 7 ....} I={x: x^2+5x+7=0}
        (d)   None

27.   What is the relationship between the following sets? A={x:x is a letter in the word *flower*} B={x:x is a letter in the word *flow*} C={x:x is a letter in the word *wolf*} D={x:x is a letter in the word *follow*}
        (a)   B=C=D and all these are subsets of the set A
        (b)   B=C≠D
        (c)   B≠C≠D
        (d)   None

28.   State whether the following sets are finite, infinite or empty: – (i) X = {1, 2, 3, …..500} (ii) Y = {y: y = a^2 ; a is an integer } (iii) A = {x:x is a positive integer multiple of 2} (iv) B = {x:x is an integer which is a perfect root of 26<x<35}
        (a)   finite, infinite, infinite, empty   (b)   infinite, infinite, finite, empty
        (c)   infinite, finite, infinite, empty   (d)   None

29. A sample of income group of 1172 families was surveyed and noticed that for income groups <₹ 6000/-, ₹ 6000/- to ₹ 10999/-, ₹ 11000/-, to ₹15999/-, ₹ 16000 and above no TV set is available to 70, 50, 20, 50 families, one set is available to 152, 308, 114, 46 families and two or more sets are available to 10, 174, 84, 94 families. If A = {x|x is a family owning two or more sets}, B = {x|x is a family with one set, }C = {x|x is a family with income less than ₹6000/-}, D = {x|x is a family with income ₹ .6000/- to ₹ 10999/-}, E = {x|x is a family with income ₹ 11000/- to₹ 15999/-}, find the number of families in each of the following sets (i)   C ∩ B
(ii)   A ∪ E

(a)   152, 580   (b)   152, 20   (c)   152, 50   (d)   152, 496

30. If four members a, b, c, d of a decision making body are in a meeting to pass a resolution where rule of majority prevails list the wining coalitions. Given that a, b, c, d own 50% 20% 15% 15% shares each.

(a)   {a, b} {a, c} {a, d} {a, b, c} {a, b, d} {a, b, c, d}   (b)   {b, c, d}

(c)   {b, c} {b, d} {c, d} {a, c, d} {b, c, d} {a} {b} {c} {d} φ   (d)   None

31. If A = {2, 3}, B = {4, 5}, C = {5, 6} then A × (B ∪ C) is

(a)   {(2, 4) (2, 5) (2, 6) (3, 4) (3, 5) (3, 6)}

(b)   {(2, 5) (3, 5)}
(c)   {(2, 4) (2, 5) (3, 4) (3, 5) (4, 5) (4, 6) (5, 5) (5, 6)}
(d)   None

ANSWERS

1.	(b)	2.	(c)	3.	(a)	4.	(b)	5.	(c)	6.	(b)	7.	(c)
8.	(b)	9.	(b)	10.	(a)	11.	(c)	12.	**(b)**	13.	(b)	14.	(a)
15.	(a)	16.	(a)	17.	D (ALL)	18.	D (ALL)	19.	(b)	20.	(a)	21.	(d)
22.	(b)	23.	(a)	24.	(a)	25.	(a)	26.	(b)	27.	(a)	28.	(a)
29.	(d)	30.	(a)	31.	(a)								

CHAPTER-11

FUNCTION
HOME WORK

1.   1. If A = {x, y, z}, B = {p, q, r, s} Which of the relation on A.B are function.
   (a)   {n, p), (x, q), (y, r), (z, s)},   (b)   {(x, s), (y, s), (z, s)}
   (c)   {(y, p), (y, q), (y, r),(z, s),   (d)   {(x, p), (y, r), (z, s)}

2.   {(x,y)|x+y = 5} where x, y $\in$R is a
   (a)   not a function   (b)   a composite function
   (c)   one-one mapping   (d)   none of these

3.   {(x , y)|x = 4} where x, y $\in$R is a
   (a)   not a function   (b)   function
   (c)   one-one mapping   (d)   none of these

4.   {(x , y), y=x^2} where x, y $\in$R is
   (a)   not a function   (b)   a function
   (c)   inverse mapping   (d)   none of these

5.   {(x, y)|x<y} where x, y $\in$R is
   (a)   not a function   (b)   a function
   (c)   one-one mapping   (d)   none of these

6.   The domain of {(1,7), (2,6)} is
   (a)   (1, 6)   (b)   (7, 6)   (c)   (1, 2)   (d)   {6, 7}

7.   The range of {(3,0), (2,0), (1,0), (0,0)} is
   (a)   {0, 0}   (b)   {0}   (c)   {0, 0, 0, 0}   (d)   none of these

8.   The domain and range of {(x, y) : y = x^2 } where x, y $\in$R is
   (a)   (reals, natural numbers)   (b)   (reals, positive reals)
   (c)   (reals, reals)   (d)   none of these

9.   Let the domain of x be the set {1}. Which of the following functions are equal to 1
   (a)   f(x) = x^2, g(x) = x   (b)   f(a) = x, g(x) = 1–x
   (c)   f(x) = x^2 +x +2 , g(x) = (x+ 1)^2 (d)   none of these

10.   If f(x) = 1/1–x, f(–1) is
   (a)   0   (b)   ½   (c)   0   (d)   none of these

11.   If g(x) = (x–1)/x, g(–½) is
   (a)   1   (b)   2   (c)   3/2   (d)   3

12.   If f(x) = 1/1–x and g(x) = (x–1)/x, than fog(x) is
   (a)   x   (b)   1/x   (c)   –x   (d)   none of these

13. If f(x) = 1/1–x and g(x) = (x–1)/x, then g of(x) is
   (a)　x–1　　　　(b)　x　　　　　(c)　1/x　　　　(d)　none of these

14. The function f(x) = 2^x is
   (a)　one-one mapping　　　　(b)　one-many
   (c)　many-one　　　　　　　(d)　none of these

15. The range of the function f(x) = $\log_{10}(1 + x)$ for the domain of real values of x when 0≤ x ≤ 9 is
   (a)　(0,1)　　　(b)　{0, 1, 2}　　(c)　{0, 1}　(d)　none of these

16. The Inverse function f^{-1} of f(x) = 2x is
   (a)　1/2x　　　　(b)　$\frac{x}{2}$　　(c)　1/x　　　　(d)　none of these

17. If f(x) = x+3, g(x) = x^2, then fog(x) is
   (a)　$x^2 + 3$　(b)　$x^2 + x +3$　　(c)　$(x+3)^2$　(d)　none of these

18. If f(x) = x+3, g(x) = x^2　　then　f(x).g(x) is
   (a)　$(x+3)^2$ (b)　x^2+3　　　(c)　x^3+3x^2　　(d)　none of these

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

20. For the function h(x) = 10^{1+x} the domain of real values of x where 0≤ x ≤ 9, the range is
   (a)　$10 \le h(x) \le 10^{10}$　　(b)　$0 \le h(x) \le 10^{10}$
   (c)　$0 < h(x) < 10$　　　　　(d)　none of these

ANSWERS

1.	(b),(d)	2.	(c)	3.	(a)	4.	(b)	5.	(a)
6.	(c)	7.	(b)	8.	(b)	9.	(a)	10.	(b)
11.	(d)	12.	(a)	13.	(b)	14.	(a)	15.	(a)
16.	(b)	17.	(a)	18.	(c)	19.	(b)	20.	(a)

CHAPTER-12

LIMIT AND CONTINUITY
HOME WORK

1. $\lim\limits_{x \to 1} \dfrac{(1 - x^{-1/3})}{(1 - x^{-2/3})}$ is equal to

    (a)   -1/2   (b)   ½   (c)   2   (d)   none of these

2. $\lim\limits_{x \to 1} \dfrac{x^2 - \sqrt{x}}{\sqrt{x} - 1}$ is equal to

    (a)   -3   (b)   1/3   (c)   3   (d)   none of these

3. $\lim\limits_{x \to 1} \dfrac{x^3 - 1}{x - 1}$ is equal to

    (a)   3   (b)   -1/3   (c)   -3   (d)   none of these

4. $\dfrac{(1+x)^6 - 1}{(1+x)^2 - 1}$ then $\lim\limits_{x \to 0} f(x)$ is equal to

    (a)   -1   (b)   3   (c)   0   (d)   none of these

5. $\lim\limits_{x \to 0} \dfrac{\log(1 + px)}{e^{3x} - 1}$ is equal to

    (a)   p/3   (b)   p   (c)   1/3   (d)   none of these

6. $\lim\limits_{x \to \infty} \dfrac{1}{x^3 + x^2 + x + 1}$ is equal to

    (a)   0   (b)   e   (c) $-e^6$ (d)   none of these

7. $\lim\limits_{x \to 2} \dfrac{4 - x^2}{3 - \sqrt{x^2 + 5}}$ is equal to

    (a)   6   (b)   1/6   (c)   -6   (d)   none of these

8. $\lim\limits_{x \to \sqrt{2}} \dfrac{x^{3/2} - 2^{3/4}}{\sqrt{x} - 2^{1/4}}$ exists and is equal to a finite value which is

    (a)   -5   (b)   1/6   (c) $3\sqrt{2}$ (d)   none of these

9. $\lim\limits_{x \to 0} \left(\dfrac{1}{x}\right) \log (1 - x/2)$ is equal to

(a)   -1/2   (b)   ½   (c)   2   (d)   none of these

10. $\lim\limits_{x \to \infty} \left[\dfrac{1^3 + 2^3 + 3^6 + --+x^3}{x^4} \right]$ is equal to

(a)   ¼   (b)   ½   (c)   -1/4   (d)   none of these

11.   A function f(x) defined as follows f(x)   =   x+1 whenx ≤ 1
                                                   =   3 – px when x > 1
      The value of p for which f(x) is continuous at x = 1 is
      (a)   −1   (b)   1   (c)   0   (d)   none of these.

12.   f(x)   =   x-1 when x >0
              = $-\,^1/_2$ when x = 0

              =   x+1 when x<0
              f(x)is
      (a)   Continuous at x = 0   (b)   undefined at x = 0
      (c)   Discontinuous   (d)   none of these.

13. $\lim\limits_{x \to 0} \dfrac{(e^{2x}-1)}{x}$ is equal to

      (a)   ½   (b)   2   (c)   0   (d)   none of these

14. $\lim\limits_{x \to \infty} \dfrac{e^x+1}{e^x+2}$ is evaluated to be

      (a)   0   (b)   -1   (c)   1   (d)   none of these

15.   If $\lim\limits_{x \to 3} \left(\dfrac{x^n-3^n}{x-3} \right)$ = 108 then the value of n is

      (a)   4   (b)   -4   (c)   1   (d)   none of these

16.   f(x) = (x² -1) / (x³-1)is undefined at x = 1the value of f(x) at x=1 such that it is
      continuous at x=1 is
      (a)   3/2   (b)   2/3   (c)   -3/2   (d)   none of these

17.   If   f(x) = 3, when x < 2
              f(x)   = Kx², when x ≥2 is continuous at x = 2, then the value of k is
      (a)   ¾   (b)   4/3   (c)   1/3   (d)   none of these

18.   f(x) = $\dfrac{x^2-3x+2}{x-1}$ x≠ 1becomes continuous at x = 1. Then the value of f(1) is
      (a)   1   (b)   -1   (c)   0   (d)   none of these

19.　$\lim\limits_{x \to 0} \dfrac{e^{x^2}-1}{x^2}$ is evaluated to be

　　(a)　1　　(b)　½　　(c)　-1　　(d)　none of these

20.　$\lim\limits_{x \to 1}\left(\dfrac{1}{x^2+x-2} - \dfrac{x}{x^3-1}\right)$ is evaluated to be

　　(a)　1/9　　(b)　9　　(c)　-1/9　　(d)　none of these

21.　$\lim\limits_{n\to\infty}\left[\dfrac{1}{6} + \dfrac{1}{6^2} + \dfrac{1}{6^3} + \cdots \ldots \ldots \ldots \ldots + \dfrac{1}{6^n}\right]$ is

　　(a)　1/5　　(b)　1/6　　(c)　-1/5　　(d)　none of these

22.　$\lim\limits_{x \to 0} \dfrac{x}{\log(1+x)}$ is equal to

　　(a)　1　　(b)　2　　(c)　-0.5　　(d)　none of these

23.　The value of the limit when n tends to infinity of the expression
　　$(7n^3-8n^2 +10n-7)\div(8n^3 -9n^2 +5)$ is
　　(a)　7/8　　(b)　8/7　　(c)　1　　(d)　None

24.　The value of the limit when n tends to infinity of the expression
　　$(n^4 -7n^2 +9)\div(3n^2 +5)$ is
　　(a)　0　　(b)　1　　(c)　−1　　(d)　∝

25.　The value of the limit when n trends to infinity of the expression
　　$(3n^3 +7n^2-11n+19)\div(17n^4 +18n^3 -20n+45)$ is
　　(a)　0　　(b)　1　　(c)　−1　　(d)　1/ 2

26.　The value of the limit when n tends to infinity of the expression
　　$n^{1/3} (n^2+1)^{1/3} (2n^2+3n+1)^{-1/2}$ is
　　(a)　0　　(b)　1　　(c)　−1　　(d)　$1/\sqrt{2}$

27.　The value of the limit when n tends to infinity of the expression $\left(1 + \dfrac{1}{n}\right)^n$ is

　　(a)　e　　(b)　0　　(c)　1　　(d)　−1

28.　The value of the limit when x tends to zero of the expression $[(1+x)^n -1] \div x$ is
　　(a)　n　　(b)　n + 1　(c)　n − 1　(d)　n(n − 1)

29.　The value of the limit when x tends to 3 of the expression $(x^2+2x-15)/(x^2 -9)$ is
　　(a)　4/3　　(b)　¾　　(c)　1/2　　(d)　indeterminate

30. The value of the limit when x tends to zero of the expression
$[(a +x^2)^{1/2} -(a-x^2)^{1/2}] \div x^2$ is
(a) $a^{-1/2}$ (b) $a^{1/2}$ (c) a (d) a^{-1}

31. The value of the limit when x tends to unity of the expression
$[(3+x)^{1/2} -(5-x)^{1/2}] \div (x^2 -1)$ is
(a)   1/4   (b)   ½   (c)   −1/4   (d)   −1/2

32. The value of the limit when n tends to infinity of the expression

$2^{-n} (n^2+5n+6)[(n+4)(n+5)]^{-1}$ is

(a)   1   (b)   0   (c)   −1   (d)   None

33. Find $\lim_{n \to \infty} [(n^3+1)^{1/2} -n^{3/2}] \div n^{3/2}$
(a)   1/4   (b)   0   (c)   1   (d)   None

34. Find $\lim_{n \to \infty} (2^n -2)(2^n +1)^{-1}$

(a)   1/4   (b) 1/2   (c) 1   (d)   None

35. Find $\lim_{n \to \infty} (2n-1)2^n (2n+1)^{-1}2^{1-n}$

(a)   2   (b)   1/2   (c)   1   (d)   None

36. Find $\lim_{n \to \infty} (n^2 +1)[(n+1)^2 +1]^{-1}5^{n+1}5^{-n}$

(a)   5   (b) e^{-1} (c)   0   (d)   None

37. Find $\lim_{n \to \infty} [n^n .(n+1)!] \div [n!(n+1)^{n+1}]$

(a)   5   (b) e^{-1} (c)   0   (d)   None

38. Find $\lim_{n \to \infty} [\{1.3.5....(2n-1)\}(n+1)^4] \div [n^4 \{1.3.5....(2n-1)(2n+1)\}]$
(a)   5   (b) e^{-1} (c)   0   (d)   None

39. Find $\lim_{n \to \infty} n^n (1+n)^{-n}$

(a) e^{-1} (b) e (c)   1   (d)   −1

40. $3x^2+2x-1$ is continuous
(a)   at x = 2   (b)   for every value of x
(c)   both (a) and (b)   (d)   None

ANSWERS

1.	(b)	2.	(c)	3.	(a)	4.	(b)	5.	(a)
6.	(a)	7.	(a)	8.	(c)	9.	(a)	10.	(a)
11.	(b)	12.	(c)	13.	(b)	14.	(c)	15.	(a)
16.	(b)	17.	(a)	18.	(b)	19.	(a)	20.	(c)
21.	(a)	22.	(a)	23.	(a)	24.	(d)	25.	(a)
26.	(d)	27.	(a)	28.	(a)	29.	(a)	30.	(a)
31.	(a)	32.	(b)	33.	(b)	34.	(c)	35.	(a)
36.	(a)	37.	(b)	38.	(c)	39.	(a)	40.	(c)

CHAPTER-13

DIFFERENTIAL CALCULUS
HOME WORK

1. The gradient of the curve $y = 2x^3 - 3x^2 - 12x + 8$ at $x = 0$ is
    (a)   −12   (b)   12   (c)   0   (d)   none of these

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

3. 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 of these

4. The gradient of the curve $y - xy + 2px + 3qy = 0$ at the point $(3, 2)$ is $\frac{-2}{3}$.
    The values of p and q are
    (a)   (1/2, 1/2)   (b)   (2, 2)   (c)   (−1/2, −1/2)   (d)   (1/2, 1/6)

5. The curve $y^2 = ux^3 + v$ passes through the point P(2, 3) and $\frac{dy}{dx} = 4$ at P.
    The values of u and v are
    (a)   (u = 2, v = 7)   (b)   (u = 2, v =− 7)
    (c)   (u = −2, v =− 7)   (d)   (0, -1)

6. The gradient of the curve $y + px + qy = 0$ at (1, 1) is 1/2. The values of p and q are
    (a)   (−1, 1)   (b)   (2, −1)   (c)   (1, 2)   (d)   (0, -1)

7. The derivative of the function $\sqrt{x + \sqrt{x}}$ is
    (a) $\frac{1}{2\sqrt{x + \sqrt{x}}}$ (b) $1 + \frac{1}{2\sqrt{x}}$
    (c) $\frac{1}{2\sqrt{x + \sqrt{x}}}\left(1 + \frac{1}{2\sqrt{x}}\right)$ (d)   none of these

8. Given $e^{-xy} - 4xy = 0$, $\frac{dy}{dx}$ can be proved to be
    (a)   − y /x   (b)   y / x   (c)   x / y   (d)   none of these

9. If $\log (x / y) = x + y$, $\frac{dy}{dx}$ may be found to be
    (a) $\frac{y(1-x)}{x(1+y)}$ (b) $\frac{y}{x}$ (c) $\frac{1-x}{1+y}$ (d)   none of these

10. If $f(x,y) = x^3 + y^3 - 3axy = 0$, $\frac{dy}{dx}$ can be found out as
    (a) $\frac{ay-x^2}{y^2+ax}$ (b) $\frac{ay-x^2}{y^2-ax}$ (c) $\frac{ay+x^2}{y^2+ax}$ (d)   none of these

11. 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 of these

12. 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 Ist quadrant, is
    (a)   2   (b)   3   (c)   −3   (d)   none of these

13. For the curve $x^2 + y^2 + 2gx + 2hy = 0$, the value of $\frac{dy}{dx}$ at (0, 0) is
    (a)   -g/h   (b)   g/h   (c)   h/g   (d)   none of these

14. If $x^3 - 2x^2 y^2 + 5x + y - 5 = 0$ then $\frac{dy}{dx}$ at x = 1, y = 1 is equal to
    (a)   4/3   (b)   − 4/3   (c)   3/4   (d)   none of these

15. If $f(x) = \left\{\frac{(a+x)}{(1+x)}\right\}^{a+1+2x}$ the value of f'(0) is
    (a) a^{a+1} (b) $a^{a+1}\left[\frac{1-a^2}{a} + 2 \log a\right]$ (c)   2 log a   (d)   none of these

16. Let $f(x) = \left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)^2$ then f' (2) is equal to
    (a)   ¾   (b)   ½   (c)   0   (d)   none of these

17. If $f(x) = x^2 - 6x + 8$ then f'(5) − f'(8) is equal to
    (a)   f'(2)   (b)   3f'(2)   (c)   2f'(2)   (d)   none of these

18. If $y = \left(x + \sqrt{x^2 + m^2}\right)^n$ then dy/dx is equal to
    (a)   ny   (b) $ny/\sqrt{x^2 + m^2}$
    (c) $-ny/\sqrt{x^2 + m^2}$ (d)   none of these

19. If $f(x) = x^k$ and f'(1) = 10 the value of k is
    (a)   10   (b)   -10   (c)   1/10   (d)   none of these

20. 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 of these

21. If $y = e^x + e^{-x}$ then $\frac{dy}{dx} - \sqrt{y^2 - 4}$ is equal to
    (a)   1   (b)   −1   (c)   0   (d)   none of these

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

23. If $y = \sqrt{x}^{\sqrt{x}^{......\infty}}$ then $\dfrac{dy}{dx}$ is equal to _____.

(a) $\dfrac{y^2}{2-y\log x}$ 　　(b) $\dfrac{y^2}{x(2-y\log x)}$ 　(c) $\dfrac{y^3}{\log x}$ 　(d) none of these

24. $f(x) = x^2/e^x$ then $f'(1)$ is equal to _____.
(a) -1/e 　(b) 1/e 　(c) e 　(d) none of these

25. If $y=(x+1)(2x-1)/(x-3)$ then dy/dx is
(a) $2(x^2-6x-1)/(x-3)^2$ 　　　　(b) $2(x^2+6x-1)/(x-3)^2$
(c) $2(x^2+6x+1)/(x-3)^2$ 　　　　(d) None

26. If $y=(x^{1/2}+2)/x^{1/2}$ then dy/dx is
(a) $-x^{-3/2}$ 　　　(b) $x^{-3/2}$ 　　　(c) $x^{3/2}$ 　　　(d) None

27. If $y=(3x^2-7)^{1/2}$ then dy/dx is
(a) $3x(3x^2-7)^{-1/2}$ 　　　(b) $6x(3x^2-7)^{-1/2}$
(c) $3x(3x^2-7)^{1/2}$ 　　　(d) None

28. If $y=(3x^3-5x^2+8)^3$ then dy/dx is
(a) $3(3x^3-5x^2+8)^2(9x^2-10x)$ 　　(b) $3(3x^3-5x^2+8)^2(9x^2+10x)$
(c) $3(3x^3-5x^2+8)^2(10x^2-9x)$ 　　(d) None

29. If $y=(6x^5-7x^3+9)^{-1/3}$ then dy/dx is
(a) $(-1/3)(6x^5-7x^3+9)^{-4/3}(30x^4-21x^2)$
(b) $(1/3)(6x^5-7x^3+9)^{-4/3}(30x^4-21x^2)$
(c) $(-1/3)(6x^5-7x^3+9)^{4/3}(30x^4-21x^2)$
(d) None

30. If $y=[(x^2+a^2)^{1/2}+(x^2+b^2)^{1/2}]^{-1}$ then dy/dx is
(a) $x(a^2-b^2)^{-1}[(x^2+a^2)^{-1/2}-(x^2+b^2)^{-1/2}]$
(b) $(a^2-b^2)^{-1}[(x^2+a^2)^{1/2}-(x^2+b^2)^{1/2}]$
(c) $x(a^2-b^2)^{-1}[(x^2+a^2)^{1/2}+(x^2+b^2)^{1/2}]$
(d) $(a^2-b^2)^{-1}[(x^2+a^2)^{1/2}+(x^2+b^2)^{1/2}]$

31. If $y=(x^{1/3}-x^{-1/3})^3$ then dy/dx is
(a) $1-x^{-2}+x^{-2/3}-x^{-4/3}$ 　　　(b) $1+x^{-2}+x^{-2/3}-x^{-4/3}$
(c) $1+x^{-2}+x^{-2/3}+x^{-4/3}$ 　　　(d) None

32. If $y=(2x+1)(3x+1)(4x+1)^{-1}$ then dy/dx is

(a) $(24x^2+12x+1)(4x+1)^{-2}$ (b) $(24x^2+12x+3)(4x+1)^{-2}$

(c) $(24x^2+12x+5)(4x+1)^{-2}$ (d)   None

33. If $y=(ax^2+bx+c)^{1/2}$ then dy/dx is

(a) $(1/2)(2ax+b)(ax^2+bx+c)^{-1/2}$ (b) $(-1/2)(2ax+b)(ax^2+bx+c)^{-1/2}$

(c) $(1/2)(ax+2b)(ax^2+bx+c)^{-1/2}$ (d)   None

34. If $y=(2x^4+3x^3-5x+6)^{-1/3}$ then dy/dx is

(a) $(-1/3)(2x^4+3x^3-5x+6)^{-4/3}(8x^3+9x^2-5)$

(b) $(1/3)(2x^4+3x^3-5x+6)^{-4/3}(8x^3+9x^2-5)$

(c) $(1/3)(2x^4+3x^3-5x+6)^{4/3}(8x^3+9x^2-5)$

(d)   None

35. If $y=\log[e^{3x}(5x-3)^{1/3}(4x+2)^{-1/3}]$ then dy/dx is

(a) $3+(1/3)[5/(5x-3)-4/(4x+2)]$ (b) $3-(1/3)[5/(5x-3)-4/(4x+2)]$

(c) $3+(1/3)[5/(5x-3)+4/(4x+2)]$ (d)   None

36. If $y=x^{x^x}$ then the value of dy/dx is

(a) $x^{x^x}[x^{x-1}+\log x.x^x(1+\log x)]$ (b) $x^{x^x}[x^{x-1}+\log x.(1+\log x)]$

(c) $x^{x^x}[x^{x-1}+\log x.x^x(1-\log x)]$ (d) $x^{x^x}[x^{x-1}+\log x.(1-\log x)]$

37. If $y=e^{5/x}(2x^2-1)^{1/2}$ then the value of [dy/dx]/y is

(a) $(2x^3-10x^2+5)x^{-2}(2x^2-1)^{-1}$ (b) $(2x^3-5x^2+10)x^{-2}(2x^2-1)^{-1}$

(c) $(2x^3+10x^2-5)x^{-2}(2x^2-1)^{-1}$ (d)   None

38. If $y=(1+x)^{2x}$ then the value of [dy/dx]/y is

(a) $2[x(x+1)^{-1}+\log(x+1)]$ (b) $x(x+1)^{-1}+\log(x+1)$

(c) $2[x(x+1)^{-1}-\log(x+1)]$ (d)   None

39. If $x(1+y)^{1/2}+y(1+x)^{1/2}=0$ then dy/dx is

(a) $-(1+x^2)^{-1}$ (b) $(1+x^2)^{-1}$ (c) $-(1+x^2)^{-2}$ (d) $(1+x^2)^{-2}$

40. If $x^2 - y^2 + 3x - 5y = 0$ then dy/dx is

    (a) $(2x+3)(2y+5)^{-1}$ (b) $(2x+3)(2y-5)^{-1}$

    (c) $(2x-3)(2y-5)^{-1}$ (d)   None

41. If $x^3 - xy^2 + 3y^2 + 2 = 0$ then dy/dx is

    (a) $(y^2 - 3x^2)/[2y(3-x)]$ (b) $(y^2 - 3x^2)/[2y(x-3)]$

    (c) $(y^2 - 3x^2)/[2y(3+x)]$ (d)   None

42. 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

43. If $x^2 + y^2 - 2x = 0$ then dy/dx is

    (a) $(1-x)/y$ (b) $(1+x)/y$ (c) $(x-1)/y$ (d)   None

44. If $x^3 + 5x^2y + xy - 5 = 0$ then dy/dx is

    (a) $-(3x^2 + 10xy + y)/[x(5x+1)]$ (b) $(3x^2 + 10xy + y)/[x(5x+1)]$

    (c) $-(3x^2 + 10xy + y)/[x(5x-1)]$ (d)   None

ANSWERS

1.	(a)	2.	(b)	3.	(c)	4.	(d)	5.	(b)
6.	(d)	7.	(c)	8.	(a)	9.	(a)	10.	(b)
11.	(a)	12.	(b)	13.	(a)	14.	(a)	15.	(b)
16.	(a)	17.	(b)	18.	(b)	19.	(a)	20.	(b)
21.	(c)	22.	(a)	23.	(b)	24.	(b)	25.	(a)
26.	(a)	27.	(a)	28.	(a)	29.	(a)	30.	(a)
31.	(d)	32.	(a)	33.	(a)	34.	(a)	35.	(a)
36.	(a)	37.	(a)	38.	(a)	39.	(a)	40.	(a)
41.	(a)	42.	(b)	43.	(a)	44.	(a)		

CHAPTER-14
INTEGRATION CALCULUS
HOME WORK

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

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

3. $\int (1 - 3x)(1 + x)\,dx$ is equal to
   (a) $x - x^2 - x^3$
   (b) $x^3 - x^2 + x$
   (c) $x - x^2 - x^3 + k$
   (d) none of these

4. $\int \left[\sqrt{x} - \dfrac{1}{\sqrt{x}}\right] dx$ is equal to
   (a) $\dfrac{2}{3}x^{\frac{3}{2}} - 2x^{\frac{1}{2}} + k$
   (b) $\dfrac{2}{3}\sqrt{x} - 2\sqrt{x} + k$
   (c) $\dfrac{1}{2\sqrt{x}} + \dfrac{1}{2x\sqrt{x}} + k$
   (d) none of these

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

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

7. $\int xe^x\,dx$ is
   (a) $(x-1)e^x + k$ (b) $(x-1)\,e^x$ (c) $x\,e^x + k$ (d) none of these

8. $\int (\log x)^2 \, dx$ and the result is

(a) $x (\log x)^2 - 2 \, x \log x + 2x + k$ (b) $x (\log x)^2 - 2x + k$

(c) $2x \log x - 2x + k$ (d)   none of these

9. Evaluate $\int (2x^2 - x^3) \, dx$ and the value is

(a) $4/3 + k$ (b)   5/12   (c) $- 4/3$ (d)   none of these

10. Evaluate $\int_2^4 (3x - 2)^2 dx$ and the value is

(a)   104   (b)   100   (c)   10   (d)   none of these.

11. Evaluate $\int_0^1 (x \, e^x) \, dx$ and the value is

(a) -1 (b)   10   (c)   10/9   (d) $+1$

12. $\int x^x (1 + \log x) \, dx$ is equal to

(a) $x^x \log x + k$ (b) $e^{x2} + k$ (c) $\frac{x^2}{2} + k$ (d) $x^x + c$

13. If $f(x) = \sqrt{1 + x^2}$ then $\int f(x) dx$ is

(a) $\frac{2}{3} x (1 + x^2)^{3/2} + k$ (b) $\frac{x}{2}\sqrt{1 + x^2} + \frac{1}{2}\log(x + \sqrt{x^2 + 1}) + k$

(c) $\frac{2}{3} x(1 + x^2)^{3/2} + k$ (d)   none of these

14. $\int (e^x + e^{-x})^2 (e^x - e^{-x}) \, dx$ is

(a) $\frac{1}{3}(e^x + e^{-x})^3 + k$ (b) $\frac{1}{2}(e^x - e^{x\cdot})^2 + k$

(c) $e^x + k$ (d)   none of these

15. $\int xe^x / (x+1)^2 \, dx$ is equal to

(a) $e^x/(x+1) + k$ (b) $e^x/x + k$ (c) $e^x + k$ (d)   none of these

16. $\int (x^4 + 3/x) \, dx$ is equal to

(a) $x^5/5 + 3 \log |x|$ (b) $1/5 \, x^5 + 3 \log |x| + k$

(c) $1/5 \, x^5 + k$ (d)   none of these

17. Evaluate the integral $\int (1-x)^3 / x\ dx$ and the answer is equal to
    (a) $\log |x| - 3x + 3/2x^2 + k$ (b) $\log x - 2 + 3x^2 + k$
    (c) $\log x + 3x^2 + k$ (d) none of these

18. The equation of the curve in the form $y = f(x)$ if the curve passes through the point (1, 0) and $f'(x) = 2x - 1$ is
    (a) $y = x^2 - x$ (b) $x = y^2 - y$
    (c) $y = x^2$ (d) none of these

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

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

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

22. $\int_0^2 \frac{x+2}{x+1}\ dx$ is
    (a) $2 + \log_e 2$ (b) $2 + \log_e 3$ (c) $\log_e 3$ (d) none of these

23. $\int_0^4 \frac{(x+1)(x+4)}{\sqrt{x}}\ dx$ is equal to
    (a) $51\frac{1}{5}$ (b) 48/5   (c) 48   (d) $55\frac{7}{15}$

24. 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

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 of these

26. $\int (x - 1)e^x / x^2 dx$ is equal to
    (a) $e^x / x + k$ (b) $e^{-x} / x + k$ (c) $-e^x / x + k$ (d) none of these

27. $\int \frac{e^x(xlogx+1)}{x}dx$ is equal to
    (a) $e^x logx + k$ (b) $e^x + k$ (c) $logx + k$ (d)   none of these

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

29. $\int_1^2 x$ logx dx is equal to
    (a)   2 log 2   (b)   – 3/4   (c)   2 log 2 – ¾ (d)   none of these

30. Evaluate $\int_1^2 \frac{x^2-1}{x^2} e^{x+\frac{1}{x}}dx$. The value is
    (a) $e^2 (e-1)$ (b) $e^2[\sqrt{e}-1]+k$ (c) $e^2\sqrt{e}$ (d)   none of these

31. $\int_0^2 3x^2$ dx is
    (a)   7   (b)   -8   (c)   8   (d)   none of these

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

33. $\int \log(\log x)$ / xdx is
    (a)   log(log x-1) +k   (b)   log x-1 + k
    (c)   [log (log x)-1] log x +k   (d)   none of these

34. Integrate w.r.t x, (3- 2x - x^4)
    (a) $3x-x^2 -x^5/5$ (b) $3x+x^2 -x^5/5$ (c) $3x+x^2+x^5/5$ (d)   None

35. Integrate w.r.t x, $(4x^3+3x^2 -2x+5)$
    (a) $x^4+x^3 -x^2+5x$ (b) $x^4 -x^3 + x^2 - 5x$
    (c) $x^4+x^3 -x^2+5$ (d)   None

36. Integrate w.r.t x, $(x^2 - 3x + x^{1/3} + 7) x^{-1/2}$
    (a) $(2/5)x^{5/2} -2x^{3/2}+(6/5)x^{5/6} -14x^{1/2}$
    (b) $(5/2)x^{5/2} -2x^{3/2}+(5/6)x^{5/6}+14x^{1/2}$
    (c) $(2/5)x^{5/2}+2x^{3/2}+(6/5)x^{5/6}+14x^{1/2}$
    (d)   None

37.　Integrate w.r.t x, $x(x^2+4)^5$

(a)　$(1/12)(x^2+4)^6 +k$　　(b)　$(1/6)(x^2+4)^6 +k$

(c)　$6(x^2+4)^6 +k$　　　　(d)　None

38.　Integrate w.r.t x, $1/[x(logx)^2]$

(a)　$-1/logx +k$　(b)　$1/logx +k$　(c)　logx　(d)　None

39.　Integrate w.r.t x, $1/(2x^2 -x-1)$

(a)　$(1/3)log[2(x-1)/(2x+1)]+c$　(b)　$-(1/3)log[2(x-1)/(2x+1)] +c$

(c)　$(1/3)log[2(1-x)/(2x+1)]$　(d)　None

40.　Integrate w.r.t x, $(x+1)(3+2x-x^2)^{-1}$

(a)　$-(1/2)log(3+2x-x^2)+(1/2)log[(x+1)/(x-3)]+c$

(b)　$(1/2)log(3+2x-x^2)+(1/2)log[(x+1)/(x-3)]+c$

(c)　$-(1/2)log(3+2x-x^2)+(1/2)log[(x-3)/(x+1)]+c$

(d)　None

41.　Integrate w.r.t x, $x^n logx$

(a)　$x^{n+1}(n+1)^{-1}[logx-(n+1)^{-1}] +c$　　(b)　$x^{n-1}(n-1)^{-1}[logx-(n-1)^{-1}]+c$

(c)　$x^{n+1}(n+1)^{-1}[logx+(n+1)^{-1}]+c$ (d)　None

42.　Integrate w.r.t x, $xe^x (x+1)^{-2}$

(a)　$e^x (x+1)^{-1} +c$ (b)　$e^x (x+1)^{-2}$　(c)　$xe^x (x+1)^{-1} +c$　(d)　None

43.　Integrate w.r.t x, $(x-x^3)^{-1}$

(a)　$(1/2)log[x^2/(1-x^2)] +k$　　(b)　$(1/2)log[x^2/(1-x)^2]+k$

(c)　$(1/2)log[x^2/(1+x)^2]+k$　(d)　None

44.　Integrate w.r.t x, $(2x+3)^{1/2}$ from lower limit 3 to upper limit 11 of *x*

(a)　33　(b)　100/3　(c)　98/3　(d)　None

ANSWERS

1.	(b)	2.	(b)	3.	(c)	4.	(a)	5.	(a)
6.	(d)	7.	(a)	8.	(a0	9.	(b)	10.	(a)
11.	(d)	12.	(d)	13.	(b)	14.	(a)	15.	(a)
16.	(b)	17.	(d)	18.	(a)	19.	(c)	20.	(a)
21.	(b)	22.	(b)	23.	(d)	24.	(b)	25.	(b)
26.	(a)	27.	(a)	28.	(b)	29.	(c)	30.	(a)
31.	(c)	32.	(b)	33.	(c)	34.	(a)	35.	(a)
36.	(a)	37.	(a)	38.	(a)	39.	(a)	40.	(a)
41.	(a)	42.	(a)	43.	(a)	44.	(c)		

STATISTICS

CHAPTER-1

Introduction to Statistics and Statistical Data
HOME WORK

1. Graph is a
(a) Line diagram   (b) Bar diagram
(c) Pie diagram   (d) Pictogram

2. Details are shown by
(a) Charts   (b) Tabular presentation   (c) both   (d) none

3. The relationship between two variables are shown in
(a) Pictogram   (b) Histogram   (c) Bar diagram   (d) Line diagram

4. In general the number of types of tabulation are
(a) two   (b) three   (c) one   (d) four

5. A table has
(a) four   (b) two   (c) five   (d) none parts.

6. The number of errors in Statistics are
(a) one   (b) two   (c) three   (d) four

7. The number of "Frequency distribution" is
(a) two   (b) one   (c) five   (d) four

8. (Class frequency)/(Width of the class) is defined as
(a) Frequency density   (b) Frequency distribution
(c) both   (d) none

9. Tally marks determines
(a) class width   (b) class boundary
(c) class limit   (d) class frequency

10. Cumulative Frequency Distribution is a
(a) graph   (b) frequency   (c) Statistical Table   (d) distribution

11. To find the number of observations less than any given value
(a) Single frequency distribution
(b) Grouped frequency distribution
(c) Cumulative frequency distribution
(d) None is used.

12. An area diagram is
(a) Histogram (b) Frequency Polygon
(c) Ogive (d) none

13. When all classes have a common width
(a) Pie Chart (b) Frequency Polygon
(c) both (d) none is used.

14. An approximate idea of the shape of frequency curve is given by
(a) Ogive (b) Frequency Polygon
(c) both (d) none

15. Ogive is a
(a) line diagram (b) Bar diagram (c) both (d) none

16. Unequal widths of classes in the frequency distribution do not cause any difficulty in the construction of
(a) Ogive (b) Frequency Polygon
(c) Histogram (d) none

17. The graphical representation of a cumulative frequency distribution is called
(a) Histogram (b) Ogive (c) both (d) none.

18. The most common form of diagrammatic representation of a grouped frequency distribution is
(a) Ogive (b) Histogram
(c) Frequency Polygon (d) none

19. Vertical bar chart may appear somewhat alike
(a) Histogram (b) Frequency Polygon (c) both (d) none

20. The number of types of cumulative frequency is
(a) one (b) two (c) three (d) four

21. A representative value of the class interval for the calculation of mean, standard deviation, mean deviation etc. is
(a) class interval (b) class limit (c) class mark (d) none

22. The number of observations falling within a class is called
(a) density (b) frequency (c) both (d) none

23. Classes with zero frequencies are called
(a) nil class (b) empty class (c) class (d) none

24. For determining the class frequencies it is necessary that these classes are
(a) mutually exclusive (b) not mutually exclusive
(c) independent (d) none

25. Most extreme values which would ever be included in a class interval are called
   (a)   class limits   (b)   class interval
   (c)   class boundaries   (d)   none

26. The value exactly at the middle of a class interval is called
   (a)   class mark (b)   mid value   (c)   both (d)   none

27. Difference between the lower and the upper class boundaries is
   (a)   width   (b)   size   (c)   both (d)   none

28. In the construction of a frequency distribution , it is generally preferable to have classes of
   (a)   equal width (b)   unequal width   (c)   maximum   (d)   none

29. Frequency density is used in the construction of
   (a)   Histogram
   (b)   Ogive
   (c)   Frequency Polygon
   (d)   none when the classes are of unequal width.

30. "Cumulative Frequency" only refers to the
   (a)   less-than type   (b)   more-than type   (c)   both (d)   none

31. For the construction of a grouped frequency distribution
   (a)   class boundaries   (b)   class limits
   (c)   both   (d)   none are used.

32. In all Statistical calculations and diagrams involving end points of classes
   (a)   class boundaries   (b)   class value
   (c)   both   (d)   none are used.

33. Upper limit of any class is _____ from the lower limit of the next class
   (a)   same   (b)   different   (c)   both (d)   none

34. Upper boundary of any class coincides with the Lower boundary of the next class.
   (a)   true (b)   false (c)   both (d)   none.

35. Excepting the first and the last, all other class boundaries lie midway between the upper limit of a class and the lower limit of the next higher class.
   (a)   true (b)   false   (c)   both (d)   none

36. The lower extreme point of a class is called
   (a)   lower class limit   (b)   lower class boundary
   (c)   both   (d)   none

37. For the construction of grouped frequency distribution from ungrouped data we Use
   (a)   class limits (b)   class boundaries (c)   class width (d)   none

38. When one end of a class is not specified, the class is called
(a)   closed- end class   (b)   open- end class   (c)   both   (d)   none

39. Class boundaries should be considered to be the real limits for the class interval.
(a)   true   (b)   false   (c)   both   (d)   none

40. Difference between the maximum & minimum value of a given data is called
(a)   width   (b)   size   (c)   range   (d)   none

41. In Histogram if the classes are of unequal width then the heights of the rectangles must be proportional to the frequency densities.
(a)   true   (b)   false   (c)   both   (d)   none

42. When all classes have equal width, the heights of the rectangles in Histogram will Be numerically equal to the
(a)   class frequencies   (b)   class boundaries   (c)   both (d)   none

43. Consecutive rectangles in a Histogram have no space in between
(a)   true   (b)   false   (c)   both   (d)   none

44. Histogram emphasizes the widths of rectangles between the class boundaries .
(a)   false   (b)   true   (c)   both   (d)   none

45. To find the mode graphically
(a)   Ogive   (b)   Frequency Polygon
(c)   Histogram   (d)   none may be used.

46. When the width of all classes is same, frequency polygon has not the same area as the Histogram.
(a)   True   (b)   false   (c)   both   (d)   none

47. For obtaining frequency polygon we join the successive points whose abscissa represent the corresponding class frequency_____
(a)   true   (b)   false   (c)   both   (d)   none

48. In representing simple frequency distributions of a discrete variable
(a)   Ogive   (b)   Histogram
(c)   Frequency Polygon   (d)   both is useful.

49.   Diagrammatic representation of the cumulative frequency distribution is
    (a)   Frequency Polygon   (b)   Ogive
    (c)   Histogram   (d)   none

50.   For the overlapping classes 0—10 , 10—20 , 20—30 etc.the class mark of the class 0—10 is
    (a)   5   (b)   0   (c)   10   (d)   none

51.   For the non-overlapping classes 0—19 , 20—39 , 40—59 the class mark of the class 0—19 is
    (a)   0   (b)   19   (c)   9.5   (d)   none

52.   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

53.   An Ogive can be prepared in _____ different ways.
    (a)   2   (b)   3   (c)   4   (d)   none

54.   The curve obtained by joining the points, whose x- coordinates are the upper limits of the class-intervals and y coordinates are corresponding cumulative frequencies is called
    (a)   Ogive   (b)   Histogram
    (c)   Frequency Polygon   (d)   Frequency Curve

55.   The breadth of the rectangle is equal to the length of the class-interval in
    (a)   Ogive   (b)   Histogram   (c)   both   (d)   none

56.   In Histogram, the classes are taken
    (a)   overlapping   (b)   non-overlapping   (c)   both   (d)   none

57.   For overlapping class-intervals the class limit & class boundary are
    (a)   same   (b)   not same   (c)   zero   (d)   none

58.   Classification is of
    (a)   four   (b)   Three   (c)   two   (d)   five kinds.

ANSWERS

1.	(a)	2.	(b)	3.	(d)	4.	(a)	5.	(c)	6.	(b)
7.	(a)	8.	(a)	9.	(d)	10.	(c)	11.	(c)	12.	(a)
13.	(b)	14.	(b)	15.	(a)	16.	(c)	17.	(b)	18.	(b)
19.	(a)	20.	(b)	21.	(c)	22.	(b)	23.	(b)	24.	(a)
25.	(c)	26.	(c)	27.	(c)	28.	(a)	29.	(a)	30.	(a)
31.	(b)	32.	(a)	33.	(b)	34.	(a)	35.	(a)	36.	(b)
37.	(a)	38.	(b)	39.	(a)	40.	(c)	41.	(a)	42.	(a)
43.	(a)	44.	(b)	45.	(c)	46.	(b)	47.	(b)	48.	(c)
49.	(b)	50.	(a)	51.	(c)	52.	(d)	53.	(a)	54.	(a)
55.	(b)	56.	(a)	57.	(a)	58.	(a)				

CHAPTER-2   Measure of Central Tendency

HOME WORK

1. _____ is the most stable of all the measures of central tendency.
    (a)   G.M   (b)   H.M   (c)   A.M   (d)   none.

2. Weighted A.M is related to
    (a)   G.M   (b)   frequency   (c)   H.M   (d)   none.

3. Frequencies are also called weights.
    (a)   True   (b)   false   (c)   both   (d)   none

4. The algebraic sum of deviations of observations from their A.M is
    (a)   2   (b)   -1   (c)   1   (d)   0

5. G.M of a set of n observations is the ——— root of their product.
    (a)   n/2 th   (b)   (n+1)th   (c)   nth   (d)   (n -1)th

6. —————————— is the reciprocal of the A.M of reciprocal of observations.
    (a)   H.M   (b)   G.M   (c)   both   (d)   none

7. A.M is never less than G.M
    (a)   True   (b)   false   (c)   both   (d)   none

8. G.M is less than H.M
    (a)   true   (b)   false   (c)   both   (d)   none

9. Median is unaffected by extreme values.
    (a)   true   (b)   false   (c)   both   (d)   none

10. The value which occurs with the maximum frequency is called
    (a)   median   (b)   mode   (c)   mean   (d)   none

11. Simple average is sometimes called
    (a)   weighted average   (b)   unweighted average
    (c)   relative average   (d)   none

12. When a frequency distribution is given, the frequencies themselves treated as weights.
    (a)   True   (b)   false   (c)   both   (d)   none

13. Simple & weighted average are equal only when all the weights are equal.
    (a)   True   (b)   false   (c)   both   (d)   none

14. The word " average " used in "simple average " and "weighted average " generally Refersto
(a) median (b) mode (c) A.M , G.M or H.M (d) none

15. The sum of the squares of deviations of a set of observations has the smallest value, whenthe deviations are taken from their
(a) A.M (b) H.M (c) G.M (d) none

16. If the variables x & z are so related that z = ax + b for each x = xi where a & b are constants, then $\bar{z} = a\ \bar{x} + b$
(a) true (b) false (c) both (d) none

17. H.M is defined when no observation is
(a) 3 (b) 2 (c) 1 (d) 0

18. The formula of mode is applicable if classes are of ————— width.
(a) equal (b) unequal (c) both (d) none

19. —————————— quartile is known as Upper quartile
(a) First (b) Second (c) Third (d) none

20. Three quartiles are used in
(a) Pearson"s formula (b) Bowley"s formula (c) both (d) none

21. There are ————— deciles.
(a) 7 (b) 8 (c) 9 (d) 10

22. 10th percentile is equal to
(a) 1st decile (b) 10th decile (c) 9th decile (d) none

23. 7th decile is the abscissa of that point on the Ogive whose ordinate is
(a) 7N/10 (b) 8N /10 (c) 6N /10 (d) none

24. ——— is equal to the value corresponding to cumulative frequency k (N + 1)/10 fromsimple frequency distribution
(a) Median (b) kth decile (c) kth percentile (d) none

25. You are given the population of India for the courses of 1981 & 1991. You are to find thepopulation of India at the middle of the period by averaging these population figures,assuming a constant rate of increase of population.
What is the suitable form of average in this case—
(a) A.M (b) G.M (c) H.M (d) none

26. The average of a series of over-lapping averages, each of which is based on a certainnumber of item within a series is known as
(a) moving average (b) weighted average
(c) simple average (d) none

27. ———————— averages is used for smoothening a time series.
    (a)   moving average   (b)   weighted average
    (c)   simple average   (d)   none

28. Pooled Mean is also called
    (a)   Mean (b)   Geometric Mean   (c)   Grouped Mean   (d)   none

29. Half of the numbers in an ordered set have values less than the ——————————
    and Halfwill have values greater than the —————————— .
    (a)   mean, median   (b)   median, median
    (c)   mode ,mean   (d)   none.

30. For an even number of values the median is the
    (a)   average of two middle values   (b)   middle value
    (c)   both   (d)   none

31. The deviations from median are —————————— if negative signs are ignored as
    Comparedto other measures of central tendency.
    (a)   minimum   (b)   maximum   (c)   same   (d)   none

32. A distribution is said to be symmetrical when the frequency rises & falls from the
    Highestvalue in the ———————————— proportion.
    (a)   unequal   (b)   equal   (c)   both   (d)   none

33. ——————— & —————————— cannot be calculated if any observation is zero.
    (a)   G.M & A.M   (b)   H.M & A.M   (c)   H.M & G. M   (d)   one.

34. ——————— & ————————— are called ratio averages.
    (a)   H.M & G.M   (b)   H. M & A.M   (c)   A.M & G.M   (d)   none

35. For ordering shoes of various sizes for resale, a —————————— size will be more
    appropriate.
    (a)   median   (b)   modal   (c)   mean   (d)   none

36. 50% of actual values will be below & 50% of will be above ——————————
    (a)   mode   (b)   median   (c)   mean   (d)   none

37. ———————————— is used when rate of growth or decline required.
    (a)   mode   (b)   A.M   (c)   G.M   (d)   none

38. ———————————— is used when sampling variability should be least.
    (a)   Mode   (b)   Median   (c)   Mean   (d)   none

39. "The sum of deviations from the mean is zero" ——— is the mathematical property
    of mean
    (a)   True   (b)   false   (c)   both   (d)   none

40. "The mean of the two samples can be combined" — is the mathematical property of mean
(a)   True   (b)   false   (c)   both   (d)   none

41. "Choices of assumed mean does not affect the actual mean"— prove the mathematical property of mean
(a)   True   (b)   false   (c)   both   (d)   none

42. Mean of 0,3,5,6,7 , 9,12,0,2 is
(a)   4.9   (b)   5.7   (c)   5.6   (d)   none

43. Median of 15,12,6,13,12,15,8,9 is
(a)   13   (b)   8   (c)   12   (d)   9

44. Median of 0.3,5,6,7,9,12,0,2 is
(a)   7   (b)   6   (c)   3   (d)   5

45. Mode of 0,3,5,6,7,9,12,0,2 is
(a)   6   (b)   0   (c)   3   (d)   5

46. Mode 0f 15,12,5,13,12,15,8,8,9,9,10,15 is
(a)   15   (b)   12   (c)   8   (d)   9

47. Measures of central tendency are called averages of the ———order.
(a) 1st (b)   2nd   (c) 3rd (d)   none

48. Measures of dispersion are called averages of the ———order.
(a) 1st (b)   2nd   (c)   3rd   (d)   none

49. For purposes of comparison between two or more series with varying size or no. of items, varying central values or units of calculation, only ——————— measures can be used.
(a)   absolute   (b)   relative   (c)   both   (d)   none

50. If y = 5 x - 20 & Mean of x = 30 then the value of Mean of y is
(a)   130   (b)   140   (c)   30   (d)   none

51. In a symmetrical distribution when the 3rd quartile plus 1st quartile is halved, the value would give
(a)   mean   (b)   mode   (c)   median   (d)   none

52. In Zoology, —————— is used.
(a)   median   (b)   mean   (c)   mode   (d)   none

53. For calculation of Speed & Velocity
(a)   G.M   (b)   A.M   (c)   H.M   (d)   none is used.

ANSWERS

1.	(c)	2.	(b)	3.	(a)	4.	(d)	5.	(c)
6.	(a)	7.	(a)	8.	(b)	9.	(a)	10.	(b)
11.	(b)	12.	(a)	13.	(a)	14.	(c)	15.	(a)
16.	(a)	17.	(d)	18.	(a)	19.	(c)	20.	(d)
21.	(c)	22.	(a)	23.	(a)	24.	(b)	25.	(b)
26.	(a)	27.	(a)	28.	(c)	29.	(b)	30.	(a)
31.	(a)	32.	(b)	33.	(c)	34.	(a)	35.	(b)
36.	(b)	37.	(c)	38.	(c)	39.	(a)	40.	(a)
41.	(a)	42.	(a)	43.	(c)	44.	(d)	45.	(b)
46.	(a)	47.	(a)	48.	(b)	49.	(b)	50.	(a)
51.	(c)	52.	(c)	53.	(c)				

CHAPTER-3   MEASURE OF DISPERSION
HOME WORK

1. —————— is least affected by sampling fluctuations.
(a) Standard deviation   (b) Quartile deviation
(c) both   (d) none

2. Standard Deviation is
(a) absolute measure (b) relative measure (c) both (d) none

3. Coefficient of variation is
(a) absolute measure (b) relative measure (c) both (d) none

4. —————— deviation is called semi-interquartile range.
(a) Percentile (b) Standard (c) Quartile (d) none

5. Quartile Deviation for the data 1,3,4,5,6,6,10 is
(a) 3 (b) 1 (c) 6 (d) 1.5

6. Coefficient of Quartile Deviation is
(a) (Quartile Deviation x 100)/Median
(b) (Quartile Deviation x 100)/Mean
(c) (Quartile Deviation x 100) /Mode
(d) none

7. If mean = 5, Standard deviation = 2.6 then the coefficient of variation is
(a) 49 (b) 51 (c) 50 (d) 52

8. If median = 5, Quartile deviation = 1. 5 then the coefficient of quartile deviation is
(a) 33 (b) 35 (c) 30 (d) 20.

9. In quality control ——— is used as a substitute for standard deviation.
(a) mean deviation (b) median (c) range (d) none

10. As the sample size increases, range also tends to increase though not proportionately.
(a) true (b) false (c) both (d) none.

11. As the sample size increases, range also tends to
(a) decrease (b) increase (c) same (d) none

12. When 1st quartile = 20, 3rd quartile = 30, the value of quartile deviation is
(a) 7 (b) 4 (c) -5 (d) 5

13. The square of standard deviation is known as
(a)　variance　　　　　(b)　standard deviation
(c)　mean deviation　　(d)　none

14. The value of the standard deviation does not depend upon the choice of the origin.
(a)　True　(b)　false　(c)　both　(d)　none

15. The value of the standard deviation will change if any one of the observations is changed.
(a)　True　(b)　false　(c)　both　(d)　none

16. When all the values are equal then variance & standard deviation would be
(a)　2　(b)　-1　(c)　1　(d)　0

17. For values lie close to the mean, the standard deviations are
(a)　big　(b)　small　(c)　moderate　(d)　none

18. If the same amount is added to or subtracted from all the values, variance & standarddeviation shall
(a)　changed　(b)　unchanged　(c)　both　(d)　none

19. If the same amount is added to or subtracted from all the values, the mean shall increaseor decrease by the ———— amount
(a)　big　(b)　small　(c)　same　(d)　none

20. For a moderately non-symmetrical distribution, Mean deviation = 4/5 of standard deviation
(a)　True　(b)　false　(c)　both　(d)　none

21. For a moderately non-symmetrical distribution, Quartile deviation = Standard deviation/3
(a)　True　(b)　false　(c)　both　(d)　none

22. In ——— range has the greatest use.
(a)　Time series　(b)　quality control　　(c)　both　(d)　none

23. Whole frequency table is needed for the calculation of
(a)　range　　(b)　variance　(c)　both　　　(d)　none

24. Relative measures of dispersion make deviations in similar units comparable.
(a)　True　　　(b)　false　(c)　both　(d)　none

25. Quartile deviation is based on the
(a)　highest 50 %　　(b)　lowest 25 %
(c)　highest 25 %　　(d)　middle 50% of the item.

26. Coefficient of variation is independent of the unit of measurement.
(a) True (b) false (c) both (d) none

27. Coefficient of variation is a relative measure of
(a) mean (b) deviation (c) range (d) dispersion

28. If each item is reduced by 15 A.M is
(a) reduced by 15 (b) increased by 15
(c) reduced by 10 (d) none

29. If each item is reduced by 10, the range is
(a) increased by 10 (b) decreased by 10
(c) unchanged (d) none

30. If each item is reduced by 20, the standard deviation
(a) increased (b) decreased (c) unchanged (d) none

31. The distribution , for which the coefficient of variation is less, is ——— consistent.
(a) less (b) more (c) moderate (d) none

ANSWERS

1.	(a)	**2.**	(a)	**3.**	(b)	**4.**	(c)
5.	(d)	**6.**	(a)	**7.**	(d)	**8.**	(c)
9.	(c)	**10.**	(a)	**11.**	(b)	**12.**	(d)
13.	(a)	**14.**	(a)	**15.**	(a)	**16.**	(d)
17.	(b)	**18.**	(b)	**19.**	(c)	**20.**	(b)
21.	(b)	**22.**	(b)	**23.**	(b)	**24.**	(b)
25.	(d)	**26.**	(a)	**27.**	(d)	**28.**	(a)
29.	(c)	**30.**	(c)	**31.**	(b)		

CHAPTER-4   CORRELATION
HOME WORK

1. Bivariate Data are the data collected for
(a)   Two variables
(b)   More than two variables
(c)   Two variables at the same point of time
(d)   Two variables at different points of time.

2. What is spurious correlation?
(a)   It is a bad relation between two variables.
(b)   It is very low correlation between two variables.
(c)   It is the correlation between two variables having no causal relation.
(d)   It is a negative correlation.

3. Scatter diagram is considered for measuring
(a)   Linear relationship between two variables
(b)   Curvilinear relationship between two variables
(c)   Neither (a) nor (b)
(d)   Both (a) and (b).

4. If the plotted points in a scatter diagram lie from upper left to lower right, then the correlation is
(a)   Positive   (b)   Zero   (c)   Negative   (d)   None of these.

5. If the plotted points in a scatter diagram are evenly distributed, then the correlation is
(a)   Zero   (b)   Negative   (c)   Positive   (d)   (a) or (b).

6. If all the plotted points in a scatter diagram lie on a single line, then the correlation is
(a)   Perfect positive   (b)   Perfect negative
(c)   Both (a) and (b)   (d)   Either (a) or (b).

7. The correlation between shoe-size and intelligence is
(a)   Zero   (b)   Positive   (c)   Negative   (d)   None of these.

8. Pearson's correlation coefficient is used for finding
    (a)   Correlation for any type of relation
    (b)   Correlation for linear relation only
    (c)   Correlation for curvilinear relation only
    (d)   Both (b) and (c).

9. Product moment correlation coefficient is considered for
    (a)   Finding the nature of correlation
    (b)   Finding the amount of correlation
    (c)   Both (a) and (b)
    (d)   Either (a) and (b).

10. When r = 1, all the points in a scatter diagram would lie
    (a)   On a straight line directed from lower left to upper right
    (b)   On a straight line directed from upper left to lower right
    (c)   On a straight line
    (d)   Both (a) and (b).

11. The covariance between two variables is
    (a)   Strictly positive   (b)   Strictly negative
    (c)   Always 0   (d)   Either positive or negative or zero.

12. The coefficient of correlation between two variables
    (a)   Can have any unit.
    (b)   Is expressed as the product of units of the two variables
    (c)   Is a unit free measure
    (d)   None of these

13. For finding the degree of agreement about beauty between two Judges in a
    Beauty Contest, we use
    (a)   Scatter diagram
    (b)   Coefficient of rank correlation
    (c)   Coefficient of correlation
    (d)   Coefficient of concurrent deviation.

14. If there is a perfect disagreement between the marks in Geography and
    Statistics, then what would be the value of rank correlation coefficient?
    (a)   Any value   (b)   Only 1   (c)   Only –1   (d)   (b) or (c)

15. 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 (b) –0.58
(c) –0.84 (d) 0.84

16. From the following data

x:	2	3	5	4	7
y:	4	6	7	8	10

Two coefficient of correlation was found to be 0.93. What is the correlation between u and v as given below?

u:	–3	–2	0	–1	2
v:	–4	–2	–1	0	2

(a)   –0.93   (b)   0.93   (c)   0.57   (d)   –0.57

17. If the sum of squares of difference of ranks, given by two judges A and B, of 8 Students is 21, what is the value of rank correlation coefficient?
(a)   0.7   (b)   0.65   (c)   0.75   (d)   0.8

18. If the rank correlation coefficient between marks in management and mathematics for a group of student 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   (b)   9   (c)   8   (d)   11

19. 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   (b)   0.2   (c)   0.25   (d)   0.28

20. 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) $\sqrt{0.2}$ (b) - $\sqrt{0.2}$ (c)   1/3   (d)   –1/3

21. What is the value of correlation coefficient due to Pearson on the basis of the following data:

x:	–5	–4	–3	–2	–1	0	1	2	3	4	5
y:	27	18	11	6	3	2	3	6	11	18	27

(a) 1   (b) –1   (c) 0   (d) –0.5

22.	The coefficient of correlation between x and y where

	x:　	64　	60　	67　	59　	69
	y:　	57　	60　	73　	62　	68
	is

	(a)　0.655　　　(b)　0.68　　　(c)　0.73　　　(d)　0.758

23.	What is the coefficient of correlation between the ages of husbands and wives from the following data?

	Age of husband (year): 46 45 42 40 38 35 32 30 27 25
	Age of wife (year):　 37 35 31 28 30 25 23 19 19 18
	(a)　0.58　　　(b)　0.98　　　(c)　0.89　　　(d)　0.92

24.	Given that for twenty pairs of observations, $\Sigma\ xu = 525$, $\Sigma\ x = 129$, $\Sigma\ u = 97$, $\Sigma\ x^2 = 687$, $\Sigma\ u^2 = 427$ and $y = 10 - 3u$, the coefficient of correlation between x and y is

	(a)　−0.7　　　(b)　0.74　　　(c)　−0.74　　　(d)　0.75

25.	Eight contestants in a musical contest were ranked by two judges A and B in the following manner:

	Serial Number of the contestants: 1 2 3 4 5 6 7 8
	Rank by Judge A: 7 6 2 4 5 3 1 8
	Rank by Judge B: 5 4 6 3 8 2 1 7
	The rank correlation coefficient is

	(a)　0.65　　　(b)　0.63　　　(c)　0.60　　　(d)　0.57

26.	Following are the marks of 10 students in Botany and Zoology:

Serial No.:	1	2	3	4	5	6	7	8	9	10
Marks in Botany:	58	43	50	19	28	24	77	34	29	75
Marks in Zoology:	62	63	79	56	65	54	70	59	55	69

	The coefficient of rank correlation between marks in Botany and Zoology is

	(a)　0.65　　　(b)　0.70　　　(c)　0.72　　　(d)　0.75

27.	What is the value of Rank correlation coefficient between the following marks in Physics and Chemistry:

Roll No.:	1	2	3	4	5	6
Marks in Physics:	25	30	46	30	55	80
Marks in Chemistry:	30	25	50	40	50	78

	(a)　0.782　　　(b)　0.696　　　(c)　0.932　　　(d)　0.857

28.	What is the coefficient of concurrent deviations for the following data:

Supply:	68	43	38	78	66	83	38	23	83 63 53
Demand:	65	60	55	61	35	75	45	40	85 80 85

(a)   0.82   (b)   0.85   (c)   0.89   (d)   −0.81

29. What is the coefficient of concurrent deviations for the following data:

Year:	1996	1997	1998	1999	2000	2001	2002	2003
Price:	35	38	40	33	45	48	49	52
Demand:	36	35	31	36	30	29	27	24

(a)   −0.43   (b)   0.43   (c)   0.5   (d) $\sqrt{2}$

30. ——————— is concerned with the measurement of the "strength of association" betweenvariables.

(a)   correlation   (b)   regression   (c)   both   (d)   none

31. Correlation coefficient is dependent of the choice of both origin & the scale of observations.

(a)   True   (b)   false   (c)   both   (d)   none

32. Correlation coefficient can be found out by

(a)   Scatter Diagram   (b)   Rank Method   (c)   both   (d)   none.

33. Covariance measures _____ variations of two variables.

(a)   joint   (b)   single   (c)   both   (d)   none

34. In calculating the Karl Pearson's coefficient of correlation it is necessary that the Datashould be of numerical measurements. The statement is

(a)   valid   (b)   not valid   (c)   both   (d)   none

35. Rank correlation coefficient lies between

(a)   0 to 1   (b)   −1 to +1 inclusive of these values
(c)   −1 to 0   (d)   both

36. In rank correlation coefficient only an increasing/decreasing relationship is required.

(a)   false   (b)   true   (c)   both   (d)   none

37. The sum of the difference of rank is

(a)   1   (b)   −1   (c)   0   (d)   none.

38. Age of Applicants for life insurance and the premium of insurance – correlation is

(a)   positive   (b)   negative   (c)   zero (d)   none

39.   "Unemployment index and the purchasing power of the common man" ——
Correlationis
(a)   positive   (b)   negative   (c)   zero (d)   none

40.   Variance may be positive, negative or zero.
(a)   true (b)   false (c)   both (d)   none

41.   Covariance may be positive, negative or zero.
(a)   true (b)   false (c)   both (d)   none

42.   In case 'Insurance companies' profits and the no of claims they have to pay "——
(a)   positive correlation   (b)   negative correlation
(c)   no correlation   (d)   none

43.   In Method of Concurrent Deviations, only the directions of change (Positive
direction /Negative direction) in the variables are taken into account for
calculation of
(a)   coefficient of S.D   (b)   coefficient of regression.
(c)   coefficient of correlation   (d)   none

ANSWERS

1.	(c)	2.	(c)	3.	(d)	4.	(c)	5.	(a)
6.	(d)	7.	(a)	8.	(b)	9.	(c)	10.	(a)
11.	(d)	12.	(c)	13.	(b)	14.	(c)	15.	(b)
16.	(b)	17.	(c)	18.	(a)	19.	(b)	20.	(d)
21.	(c)	22.	(a)	23.	(b)	24.	(c)	25.	(d)
26.	(d)	27.	(d)	28.	(c)	29.	(a)	30.	(a)
31.	(b)	32.	(b)	33.	(a)	34.	(a)	35.	(b)
36.	(a)	37.	(c)	38.	(a)	39.	(b)	40.	(b)
41.	(a)	42.	(b)	43.	(c)						

CHAPTER-5   REGRESSION ANALYSIS
HOME WORK

1.   Since Blood Pressure of a person depends on age, we need consider
(a)   The regression equation of Blood Pressure on age
(b)   The regression equation of age on Blood Pressure
(c)   Both (a) and (b)
(d)   Either (a) or (b).

2.   The method applied for deriving the regression equations is known as
(a)   Least squares   (b)   Concurrent deviation
(c)   Product moment   (d)   Normal equation.

3.   The difference between the observed value and the estimated value in regression analysisis known as
(a)   Error (b)   Residue   (c)   Deviation   (d)   (a) or (b).

4.   The errors in case of regression equations are
(a)   Positive   (b)   Negative   (c)   Zero (d)   All these.

5.   The two lines of regression become identical when
(a) $r = 1$ (b) $r = -1$ (c) $r = 0$ (d)   (a) or (b).

6.   What are the limits of the two regression coefficients?
(a)   No limit
(b)   Must be positive
(c)   One positive and the other negative
(d)   Product of the regression coefficient must be numerically less than unity.

7.   The regression coefficients remain unchanged due to a
(a)   Shift of origin   (b)   Shift of scale
(c)   Both (a) and (b)   (d)   (a) or (b).

8.   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) $2y + 3x = 5$
(c) $y = 2 + 3x$ (d) $y = 3 + 5x$

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

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

11. Given the following equations: 2x – 3y = 10 and 3x + 4y = 15, which one is the regressionequation of x on y ?
(a) 1st equation   (b) 2nd equation
(c) both the equations   (d) none of these

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

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

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

15. The regression equation of y on x for the following data:

x	41	82	62	37	58	96	127	74	123	100
y	28	56	35	17	42	85	105	61	98	73

Is given by
(a) y = 1.2x – 15   (b) y = 1.2x + 15
(c) y = 0.93x – 14.64   (d) y = 1.5x – 10.89

16. The following data relate to the heights of 10 pairs of fathers and sons:
(175, 173), (172, 172), (167, 171), (168, 171), (172, 173), (171, 170), (174, 173), (176, 175) (169, 170), (170, 173)
The regression equation of height of son on that of father is given by
(a) y = 100 + 5x   (b) y = 99.708 + 0.405x
(c) y = 89.653 + 0.582x   (d) y = 88.758 + 0.562x

17. The two regression coefficients for the following data:

x: 38   23   43   33   28

y: 28   23   43   38   8

are

(a)   1.2 and 0.4   (b)   1.6 and 0.8

(c)   1.7 and 0.8   (d)   1.8 and 0.3

18. For y = 25, what is the estimated value of x, from the following data:

X: 11   12   15   16   18   19   21

Y: 21   15   13   12   11   10   9

(a)   15   (b)   13.926   (c)   13.588   (d)   14.986

19. Given the following data:

Variable: x   y

Mean: 80   98

Variance: 4   9

Coefficient of correlation = 0.6

What is the most likely value of y when x = 90 ?

(a)   90   (b)   103   (c)   104   (d)   107

20. The two lines of regression are given by

8x + 10y = 25 and 16x + 5y = 12 respectively.

If the variance of x is 25, what is the standard deviation of y?

(a)   16   (b)   8   (c)   64   (d)   4

21. The coefficient of correlation between cost of advertisement and sales of a product on thebasis of the following data:

Ad cost (000 ₹):   75   81   85   105   93   113   121   125

Sales (000 000 ₹): 35   45   59   75   43   79   87   95

is

(a)   0.85   (b)   0.89   (c)   0.95   (d)   0.98

22. ——————— gives the mathematical relationship of the variables.

(a)   correlation   (b)   regression   (c)   both   (d)   none

23. The lines of regression passes through the points, bearing _____ no. of points on bothsides

(a)   equal   (b)   unequal   (c)   zero   (d)   none

24. In linear equations Y = a + bX and X= a + bY 'a' is the

(a)   intercept of the line (b)   slope   (c)   both   (d)   none

25. In linear equations Y = a + bX and X = a + bY ' b ' is the
   (a) intercept of the line (b) slope of the line (c) both (d) none

26. The regression equations Y = a + bX and X = a + bY are based on the method of
   (a) greatest squares (b) least squares (c) both (d) none

27. Two regression lines always intersect at the means.
   (a) true (b) false (c) both (d) none

28. r, bxy , byx all have _____ sign.
   (a) different (b) same (c) both (d) none

29. The regression coefficients are zero if r is equal to
   (a) 2 (b) −1 (c) 1 (d) 0

30. The regression lines are identical if r is equal to
   (a) +1 (b) −1 (c) +1 (d) 0

31. The regression lines are perpendicular to each other if r is equal to
   (a) 0 (b) +1 (c) −1 (d) $\pm$1

32. The coefficient of determination is defined by the formula
   (a) $r^2 = 1 - \dfrac{\text{unexpalined variance}}{\text{total variance}}$ (b) $r^2 = \dfrac{\text{expalined variance}}{\text{total variance}}$

   (c) both (d) none

33. In the line Y = 19 – 5X/2 is the regresson equation x on y then bxy is, b_{yx} is equal to
   (a) 19/2 (b) 5/2 (c) –5/2 (d) –2/5

34. In the regression equation x on y, X = 35/8 – 2Y /5, b_{xy} is equal to
   (a) –2/5 (b) 35/8 (c) 2/5 (d) 5/2

35. Neither y nor x can be estimated by a linear function of the other variable when r is equalto
   (a) + 1 (b) − 1 (c) 0 (d) none

36. The angle between the regression lines depends on
   (a) correlation coefficient (b) regression coefficient
   (c) both (d) none

37. Correlation coefficient r lie between the regression coefficients byx and bxy
     (a)   true   (b)   false   (c)   both   (d)   none

38. Since the correlation coefficient r cannot be greater than 1 numerically, the product of theregression must
     (a)   not exceed 1   (b)   exceed 1   (c)   be zero   (d)   none

39. The correlation coefficient r is the _____ of the two regression coefficients b_{yx} andb_{xy}
     (a)   A.M   (b)   G.M   (c)   H.M   (d)   none

40. The regression equation of Y on X is, 2x + 3Y + 50 = 0. The value of b_{YX} is
     (a)   2/3   (b)   – 2/3   (c)   –3/2   (d)   none

ANSWERS

1.	(a)	2.	(a)	3.	(d)	4.	(d)	5.	(d)
6.	(d)	7.	(a)	8.	(c)	9.	(a)	10.	(b)
11.	(d)	12.	(a)	13.	(c)	14.	(a)	15.	(c)
16.	(b)	17.	(a)	18.	(c)	19.	(d)	20.	(b)
21.	(c)	22.	(b)	23.	(b)	24.	(a)	25.	(b)
26.	(b)	27.	(a)	28.	(b)	29.	(d)	30.	(c)
31.	(a)	32.	(c)	33.	(d)	34.	(a)	35.	(c)
36.	(a)	37.	(a)	38.	(a)	39.	(b)	40.	(b)

CHAPTER-6   INDEX NUMBER
HOME WORK

1. Each of the following statements is either True or False. Write your choice of the answer by writing T for True
   (a) Index Numbers are the signs and guideposts along the business highway that indicateto the businessman how he should drive or manage.
   (b) "For Construction index number, the best method on theoretical ground is not thebest method from practical point of view".
   (c) Weighting index numbers makes them less representative.
   (d) Fisher's index number is not an ideal index number.

2. Each of the following statements is either True or False. Write your choice of the answer by writing F for false.
   (a) Geometric mean is the most appropriate average to be used for constructing an index number.
   (b) Weighted average of relatives and weighted aggregative methods render the same result.
   (c) "Fisher's Ideal Index Number is a compromise between two well-known indices – not a right compromise, economically speaking".
   (d) "Like all statistical tools, index numbers must be used with great caution".

3. The best average for constructing an index numbers is
   (a) Arithmetic Mean   (b) Harmonic Mean
   (c) Geometric Mean   (d) None of these.

4. The time reversal test is satisfied by
   (a) Fisher's index number   (b) Paasche's index number.
   (c) Laspeyre's index number   (d) None of these.

5. The factor reversal test is satisfied by
   (a) Simple aggregative index number   (b) Paasche's index number.
   (c) Laspeyre's index number   (d) None of these.

6. The circular test is satisfied by
   (a) Fisher's index number   (b) Paasche's index number
   (c) Laspeyre's index number   (d) None of these

7. Fisher's index number is based on
(a) The Arithmetic mean of Laspeyre's and Paasche's index numbers.
(b) The Median of Laspeyre's and Paasche's index numbers.
(c) The Mode of Laspeyre's and Paasche's index numbers.
(d) None of these.

8. Fisher's ideal index number is
(a) The Median of Laspeyre's and Paasche's index numbers
(b) The Arithmetic Mean of Laspeyre's and Paasche's index numbers
(c) The Geometric Mean of Laspeyre's and Paasche's index numbers
(d) None of these.

9. Time reversal Test is satisfied by following index number formula is
(a) Laspeyre's Index number.
(b) Simple Arithmetic Mean of price relative formula
(c) Marshall-Edge worth formula.
(d) None of these.

10. 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) 150   (c) 225   (d) None of these.

11. 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) 150%   (c) 350% (d) None of these.

12. 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) 135   (c) 65   (d) None of these.

13. Each of the following statements is either True or False with your choice of the answer by writing F for False.
(a) Base year quantities are taken as weights in Laspeyre's price Index number.
(b) Fisher's ideal index is equal to the Arithmetic mean of Laspeyre's and Paasche's index numbers.
(c) Laspeyre's index number formula does not satisfy time reversal test.
(d) None of these.

14. (a) Current year quantities are taken as weights in Paasche's price index number.

(b) Edge worth Marshall's index number formula satisfies Time, Reversal Test.

(c) The Arithmetic mean of Laspeyre's and Paasche's index numbers is called Bowely's index numbers.

(d) None of these.

15. With the base year 1960 the C. L. I. in 1972 stood at 250. X was getting a monthly Salary of ₹ 500 in 1960 and ₹ 750 in 1972. In 1972 to maintain his standard of living in 1960 x has to receive as extra allowances of

(a) ₹ 600/-   (b) ₹ 500/-   (c) ₹ 300/-   (d) none of these.

16. From the following data with 1966 as base year

Commodity	Quantity Units	Values (₹)
A	100	500
B	80	320
C	60	150
D	30	360

The price per unit of commodity A in 1966 is

(a) ₹ 5   (b) ₹ 6   (c) ₹ 4   (d) ₹ 12

17. 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) 35%   (c) 52%   (d) 48%

18. Purchasing Power of Money is

(a) Reciprocal of price index number.   (b) Equal to price index number.

(c) Unequal to price index number.   (d) None of these.

19. The cost of living Index (C.L.I.) is always :

(a) Weighted index   (b) Price Index.

(c) Quantity Index.   (d) None of these.

20. If the 1970 index with base 1965 is 200 and 1965 index with base 1960 is 150, the index 1970 on base 1960 will be :

(a) 700   (b) 300   (c) 500   (d) 600

21. Circular Test is not met by :
- (a) The simple Geometric mean of price relatives.
- (b) The weighted aggregative with fixed weights.
- (c) Laspeyre's or Paasche's or the fisher's Ideal index.
- (d) None of these.

22. From the following data

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	4	3	6	2
B	5	4	6	4
C	7	2	9	2
D	2	3	1	5

Then the value ratio is:

(a) $\frac{59}{52}$ (b) $\frac{49}{47}$ (c) $\frac{41}{53}$ (d) $\frac{47}{53}$

23. The value index is equal to :
- (a) The total sum of the values of a given year multiplied by the sum of the values of thebase year.
- (b) The total sum of the values of a given year Divided by the sum of the values of thebase year.
- (c) The total sum of the values of a given year plus by the sum of the values of the baseyear.
- (d) None of these.

24. In 1996 the average price of a commodity was 20% more than in 1995 but 20% less thanin 1994; and more over it was 50% more than in 1997 to price relatives using 1995 as base(1995 price relative 100) Reduce the data is :
- (a)   150, 100, 120, 80 for (1994–97)   (b)   135, 100, 125, 87 for (1994–97)
- (c)   140, 100, 120, 80 for (1994–97)   (d)   None of these.

25. The Bowley's Price index number is represented in terms of :
- (a) A.M. of Laspeyre's and Paasche's Price index number.
- (b) G.M. of Laspeyre's and Paasche's Price index number.
- (c) A.M. of Laspeyre's and Walsh's price index number.
- (d) None of these.

26. The price index number using simple G.M. of the n relatives is given by :

    (a) $\log I_{on} = 2 - \frac{1}{n}\sum \log \frac{P_n}{P_0}$ (b) $\log I_{on} = 2 + \frac{1}{n}\sum \log \frac{P_n}{P_0}$

    (c) $\log I_{on} = \frac{1}{2n}\sum \log \frac{P_n}{P_0}$ (d) None of these.

27. The price of a commodity increases from ₹ 5 per unit in 1990 to ₹ 7.50 per unit in 1995 and the quantity consumed decreases from 120 units in 1990 to 90 units in 1995. The price and quantity in 1995 are 150% and 75% respectively of the corresponding price and quantity in 1990. Therefore, the product of the price ratio and quantity ratio is :

    (a) 1.8   (b) 1.125   (c) 1.75 (d) None of these.

28. Consumer price index number goes up from 110 to 200 and the Salary of a worker is also raised from ₹ 325 to ₹ 500. Therefore, in real terms, to maintain his previous standard of living he should get an additional amount of :

    (a) ₹ 85 (b) ₹ 90.91   (c) ₹ 98.25   (d) None of these.

29. The average price of certain commodities in 1980 was ₹ 60 and the average price of thesame commodities in 1982 was ₹ 120. Therefore, the increase in 1982 on the basis of1980 was 100%. The decrease in 1980 with 1982 as base, comment onthe above statement is :

    (a) The price in 1980 decreases by 60% using 1982 as base.
    (b) The price in 1980 decreases by 50% using 1982 as base.
    (c) The price in 1980 decreases by 90% using 1982 as base.
    (d) None of these.

30. Cost of living index (C.L.I.) numbers are also used to find real wages by the process of

    (a) Deflating of Index number.   (b) Splicing of Index number.
    (c) Base shifting.   (d) None of these.

31. From the following data

Commodities	A	B	C	D	
1992 Base	Price	3	5	4	1
	Quantity	18	6	20	14
1993	Price	4	5	6	3
Current Year	Quantity	15	9	26	15

The Passche price Index number is :

    (a) 146.41   (b) 148.25   (c) 144.25   (d) None of these.

32. From the following data

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	7	17	13	25
B	6	23	7	25
C	11	14	13	15
D	4	10	8	8

The Marshall Edge Worth Index number is :

(a)   148.25   (b)   144.19   (c)   147.25   (d)   None of these.

33. The circular Test is an extension of

(a)   The time reversal Test.   (b)   The factor reversal Test.

(c)   The unit Test.   (d)   None of these.

34. Circular test, an index constructed for the year 'x' on the base year 'y' and for the year 'y' on the base year 'z' should yield the same result as an index constructed for 'x' on base year 'z' i.e. $I_{01} \times I_{12} \times I_{20}$ equal is :

(a)   3   (b)   2   (c)   1   (d)   None of these.

35. Net monthly salary of an employee was ₹ 3,000 in 1980. The consumer price index number in 1985 is 250 with 1980 as base year. If the has to be rightly compensated then, 7th dearness allowances to be paid to the employee is :

(a)   ₹ 4.800.00   (b) ₹ 4,700.00   (c)   ₹ 4,500.0   (d)   None of these

36. The consumer price Index for April 1985 was 125. The food price index was 120 and other items index was 135. The percentage of the food weight of the index is

(a)   66.67   (b)   68.28   (c)   90.25   (d)   None of these.

37. The total value of retained imports into India in 1960 was ₹ 71.5 million per month. The corresponding total for 1967 was ₹ 87.6 million per month. The index of volume of retained imports in 1967 composed with 1960 (= 100) was 62.0. The price index for retained inputs for 1967 over 1960 as base is

(a)   198.61   (b)   197.61   (c)   198.25   (d)   None of these.

ANSWERS

1.	(a), (b)	**9.**	(c)	**17.**	(c)	**25.**	(a)	**33.**	(a)
2.	(c)	**10.**	(c)	**18.**	(a)	**26.**	(b)	**34.**	(c)
3.	(c)	**11.**	(b)	**19.**	(a)	**27.**	(b)	**35.**	(c)
4.	(a)	**12.**	(c)	**20.**	(b)	**28.**	(b)	**36.**	(a)
5.	(a)	**13.**	(b)	**21.**	(c)	**29.**	(b)	**37.**	(b)
6.	(d)	**14.**	(d)	**22.**	(a)	**30.**	(a)		
7.	(d)	**15.**	(b)	**23.**	(b)	**31.**	(a)		
8.	(c)	**16.**	(a)	**24.**	(a)	**32.**	(b)		

CHAPTER-7   THEORY OF CHANCE (PROBABILITY)
HOME WORK

1. A class consists of 100 students, 25 of them are girls and 75 boys. 20 of them are rich and remaining poor. 40 of them are fair complexioned. What is the probability of selecting a fair complexioned rich girl?
   (a) 0.85   (b) 0.02   (c) 0.24   (d) 0.64

2. A card is drawn at random from a pack of 52 cards, the probability of getting a club is
   (a) 1/4   (b) 1/52   (c) 1/13   (d) none of them

3. A card is drawn at random from a pack of 52 cards, the probability of getting a queen is
   (a) 1/4   (b) 1/52   (c) 1/13   (d) 4/13

4. A card is drawn at random from a pack of 52 cards, the probability of getting a club queen is
   (a) 1/14   (b) 1/52   (c) 1/13   (d) 4/13

5. A card is drawn at random from a pack of 52 cards, find the probability of getting a club or a queen is
   (a) 1/14   (b) 1/52   (c) 1/13   (d) 4/13

6. A box contains 6 black and 4 white balls. Two balls are drawn at random from it, the probability that both are of different colour is
   (a) 4/15   (b) 5/15   (c) 7/15   (d) 8/15

7. Two cubical dice are thrown simultaneously, the probability of getting total '9' is
   (a) 1/4   (b) 1/6   (c) 1/9   (d) 1/36

8. Two cubical dice are thrown simultaneously, the probability of getting total at least '9' is
   (a) 5/36   (b) 5/18   (c) 10/36   (d) 1/9

9. One bag contains 5 black and 3 white balls. Another bag contains 4 black and 5 white balls. One ball is drawn from each bag, the probability that they are of different colour is
   (a) 37/72   (b) 27/72   (c) 8/72   (d) 17/72

10. Two dice are thrown simultaneously, the probability that the sum of the numbers is divisible by 3 or 4 is

(a) 5/36   (b) 5/18   (c) 5/9   (d) 7/36

11. The probability of getting total at the most '6' when three cubical dice are thrown is

(a) 5/54   (b) 5/ 72   (c) 5/36   (d) 5/216

12. A card as drawn from a pack of 52 cards and it is thrown away. Then another card is drawn, the probability that it is a queen.

(a) 1/4   (b) 1/52   (c) 4/13   (d) 1/13

13. Three persons A, B and C aim a target. The probabilities of their hitting the target arerespectively2/3, 1/4, 1/2 . What is the probability that the target will be hit?

(a) 1/8   (b) 3/8   (c) 5/8   (d) 7/8

14. An example of statistics is given to three students A, B and C. Their probabilities of solving the example correctly are respectively 1/2, 3/4, 1/4, the probability that the example will be solved is

(a)20/32   (b) 27/32   (c) 28/32   (d) 29/32

15. The present age of a person A is 35. The odds in favour of his living upto the age of 65 is 3 : 2. The age of another person B is 40 at present. The odds against his living upto the age of 70 is 4 : 1. The probability that atleast one of them will be alive after 30 years is

(a) 17/30   (b) 17/25   (c) 18/72   (d) 7/25

16. In three different families, there are respectively 3 boys and 2 girls, 2 boys and 3 girls, 4 boys and 1 girl. A family is selected at random and from it 2 children are taken at random, the probability that both are boys is

(a) 1/3   (b) 2/3   (c) 3/7   (d) 7/72

17. A group consists of 7 men and some women. The probability of selecting 2 women from them is 1/15. The number of women in the group is

(a) 5   (b) 3   (c) 8   (d) 7

18. A number is taken at random from the numbers 1 to 100, the probability that the number is divisible by '3' or '7' is

(a) 45/100   (b) 43/100   (c) 47/100   (d) 51/100

19. A and B choose any one digit at random from the digits 0, 1, 2, ... 9. independently. The probability that the product of the two digits is zero is

(a) 0.20   (b) 0.22   (c) 0.18   (d) 0.19

20. There are 5 red and 4 black balls in a bag. Two draws of two balls are made from it. The probabilities that the first drawing gives 2 red balls and the second drawing gives 2 black balls if the balls are not replaced is

(a) 5/62   (b) 5/108   (c) 5/63   (d) 5/72

21. There are 5 red and 4 black balls in a bag. Two draws of two balls are made from it. The probability that the first drawing gives 2 red balls and the second drawing gives 2 black balls if the balls are replaced is

(a) 5/62   (b) 5/108   (c) 5/63   (d) 5/72

22. In a city 60% read newspaper A, 40% read newspaper B and 30% read newspaper C, 20% read A and B, 20% read A and C, 25% read B and C. Also 15% read papers A, B and C. The percentage of people who do not read any of these newspapers is :

(a) 15%   (b) 55%   (c) 20%   (d) none of the above

23. A bag contains 4 white and 3 black balls. Two draws of 2 balls are successively made, the probability of getting 2 white balls at first draw and 2 black balls at second draw when the balls drawn at first draw were replaced is:

(a) 3/49   (b) 1/49   (c) 9/49   (d) 2/49

24. The probability of two persons being borne on the same day (ignoring date) is:

(a) 1/49   (b) 1/365   (c) 1/7   (d) none of the above

25. In a group of 20 persons, there are 5 graduates. If 3 persons are selected at random from the group, the probability that at least one is graduate is

(a) 115/228   (b) 135/228   (c) 225/228   (d) 137/228

26. One urn contains 4 red and 5 white balls and the second urn contains 6 red and 3 white balls. One of the urns is selected at random and two balls are drawn from it. The probability that both the balls are red is

(a) 5/24   (b) 5/48   (c) 7/48   (d) 7/24

27. An urn A contains 5 white and 3 black balls and B contains 4 white and 4 black balls. An urn is selected and a ball is drawn from it, the probability that the ball is white is :

(a) 9/16   (b) 9/18   (c) 10/32   (d) 10/16

28. Two dice are rolled by two players A and B. A throws total 10, the probability that B throws more than A is
    (a) 1/12   (b) 1/36   (c) 1/18   (d) none of the above

29. The data reveals that 10 per cent patients die in a particular type of operation. A doctor performed 9 operations and all of them survived. Whether the 10th patient on being operated:
    (a) will survive   (b) will die   (c) may survive or may die   (d) none of the above

30. There are two groups of students consisting of 4 boys and 2 girls, 3 boys and 1 girl. One student is selected from each groups. The probability of one boy and one girl being selected is :
    (a) 1/12   (b) 5/12   (c) 1   (d) ½

31. In a shooting competition, Mr. X can shoot at the bulls eye 4 times out of 5 shots and Mr. Y, 5 times out of six shots and Mr. Z, 3 times out of 4 shots. The probability that the target will be hit at least twice is :
    (a) 100/120   (b) 50/120   (c) 110/120   (d) 107/120

32. A and B toss a coin alternately. One who gets head first wins. The probabilities of their winning are respectively
    (a) 2/3,1/3   (b) 1/2,1/2   (c) 3/4,1/4   (d) 5/6 , 1/6

33. A can hit a target 3 times out of 5 trials, B can hit the target 2 times out of 5 trials; C can hit the target 3 times out of 4 trials. If all the three try simultaneously find the probability that at least 2 will hit the target.
    (a) 0.63   (b) 0.5   (c) 0.69   (d) 0.65

34. Three dice are rolled simultaneously. The probability of getting 12 spots is :
    (a) 1/64   (b) 25/216   (c) 1/36   (d) none of the above

35. A number is selected randomly from each of the two sets
    1, 2, 3, 4, 5, 6, 7, 8
    2, 3, 4, 5, 6, 7, 8, 9
    The probability that the sum of the numbers is equal to 9 is :
    (a) 8/64   (b) 8/72   (c) 14/81   (d) 7/64

36. A bag contains 3 white, 1 black and 3 red balls. Two balls are drawn from the well shaked bag. The probability of both the balls being black is :
    (a) 0   (b) 1   (c) 1/7   (d) 1/9

37. The chance of winning the race of the horse A is 1/5 and that of horse B is 1/6. The probability that the race will be won by A or B is :

    (a) 11/30   (b) 1/3 (c) 1/30   (d) none of the above

38. The probability of Mr. A living 20 years more is 1/5 and that of Mr. B is 1/7. The probability that at least one of them will survive 20 years hence is :

(a) 12/35   (b) 1/35   (c) 11/35   (d) 14/35

39. For a 60 year old person living upto the age of 70, it is 7 : 5 against him and for another 70 years old person surviving upto the age of 80, it is 5 : 2 against him. The probability that one of them will survive for 10 years more is :

(a) 15/42   (b) 39/84   (c) 49/84   (d) 40/84

40. If 7 : 6 is in favour of P to survive 10 years more and 5 : 3 in four of Q to survive 10 years more, the probability that all least one of them will survive for 10 years more is:

(a) 86/104   (b) 13/26   (c) 2/26   (d) 42/52

41. The chance of Ram to stand first in the class is 1/3 and that of Rahim is 1/5. The probability that either of the two will stand first in the class is :

(a) 1/15   (b) 6/15   (c) 8/15   (d) 5/15

42. Four dice are thrown, find the probability that 1 will appear on at least one of the dice.

(a) 616/1296   (b) 308/1296   (c) 671/1296   (d) 72/1296

43. A husband and his wife appear in an interview for two vacancies. The probability of their selection are respectively 1/4 and 1/3. What is the probability that only one of them will be selected?

(a) 5/11   (b) 5/12   (c) 5/13   (d) 5/14

44. The probability that a leap year will have 53 Sundays is :

(a) 1/7   (b) 2/7   (c) 3/7   (d) 1/53

45. There are 10 balls numbered from 1 to 10 in a box. If one of them is selected at random, what is the probability that the number printed on the ball would be an odd number greater than 4?

(a)   0.50   (b)   0.40   (c)   0.60   (d)   0.30

46. Following are the wages of 8 workers in rupees:

50, 62, 40, 70, 45, 56, 32, 45

If one of the workers is selected at random, what is the probability that his wage would be lower than the average wage?

(a)   0.625   (b)   0.500   (c)   0.375   (d)   0.450

47. 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

48. Tom speaks truth in 30 percent cases and Dick speaks truth in 25 percent cases. What is the probability that they would contradict each other?

(a)   0.325   (b)   0.400   (c)   0.925   (d)   0.075

49. 8 identical balls are placed at random in three bags. What is the probability that the first bag will contain 3 balls?

(a)   0.2731   (b)   0.3256   (c)   0.1924   (d)   0.3443

50. Four digits 1, 2, 4 and 6 are selected at random to form a four digit number. What is the probability that the number so formed, would be divisible by 4?

(a)   1/2   (b)   1/5   (c)   1/4   (d)   1/3

51.   A card is drawn from each of two well-shuffled packs of cards. The probability that at least one of them is an ace is

a) $\frac{1}{69}$ (b) $\frac{25}{169}$ (c) $\frac{2}{13}$ (d)   None.

ANSWERS

1.	(b)	14.	(d)	27.	(a)	40.	(a)
2.	(a)	15.	(b)	28.	(a)	41.	(c)
3.	(c)	16.	(a)	29.	(c)	42.	(c)
4.	(b)	17.	(b)	30.	(b)	43.	(b)
5.	(d)	18.	(b)	31.	(d)	45.	(b)
6.	(d)	19.	(d)	32.	(a)	44.	(d)
7.	(c)	20.	(c)	33.	(a)	45.	(b)
8.	(b)	21.	(b)	34.	(b)	46.	(c)
9.	(a)	22.	(c)	35.	(d)	47.	(b)
10.	(c)	23.	(d)	36.	(a)	48.	(a)
11.	(a)	24.	(c)	37.	(a)	49.	(d)
12.	(d)	25.	(d)	38.	(c)	50.	(b)
13.	(d)	26.	(d)	39.	(b)		

CHAPTER-8   RANDOM VARIABLES AND MATHEMATICAL EXPECTATION
HOME WORK

1. The probability distribution of a random variable x is as follows

2	3	4	5	6	7	8	9	10
0.05	.10	.30	.20	.05	.10	.05	.10	.05

    The mean of x is
    (a)   1.9   (b)   5.4   (c)   3.6   (d)   6.5

2. The probability distribution of a random variable is as follows :

15	16	17	18	19	20
.04	.19	3p	.26	p	.07

    The value of p is
    (a)   0.11   (b)   0.15   (c)   0.10   (d)   none of them

3. 4 coins are tossed simultaneously, the expected number of heads is
    (a)   1   (b)   2.5   (c)   3   (d)   2

4. Two coins are tossed simultaneously. A person receives ₹ 8 for each head and loses ₹ 10 for each tail. The expected value of the amount gained by him is
    (a)   1   (b)   –2   (c)   3   (d)   –3

5. There are 5 white and 3 black balls in a box. 3 balls are taken at random from the box. The expected number of black balls is
    (a)   2   (b)   6/9   (c)   3   (d)   9/8

6. There are 4 black and 2 white balls in a box and 2 balls are taken at random from it. If a person receives ₹ 4 for each white ball and loses ₹ 2 for each black ball, the mathematical expectation of the amount received by him is
    (a)   1   (b)   0   (c)   –3   (d)   5

7. There are 3 black and 2 white balls in a box. 2 balls are taken from it. ₹ 24 is given for each black ball. What amount should be charged for each white ball so that the game is fair?
    (a)   72   (b)   54   (c)   36   (d)   33

8. There are 8 screws in a packet of which 2 are defective. If 2 screws are taken at random, the expected number of defective screws is

(a) 2   (b) 4   (c) 0.5   (d) 3

9. There are 5 tickets in a box numbered 1, 1, 2, 2, 2 respectively. Two tickets are taken at random from it, the expectation of the total of the numbers on the tickets is

(a) 7.2   (b) 5.4   (c) 3.2   (d) 3.3

10. There are 100 tickets in a lottery of Re. 1 each. There is only one ticket in the lottery bearing a prize of ₹ 80. A person purchases 1 ticket. His expectation is

(a) 2   (b) 4   (c) –0.5   (d) –0.2

11. A person takes an insurance of ₹ 1000 and pays premium of ₹ 20. The probability that any person of his age group dies within a year is 0.01, the expected gain of the insurance company is

(a) 12   (b) 14   (c) 10   (d) 20

12. Two tickets are taken at random from 5 tickets numbered from 1 to 5, the expected value of the sum obtained on the two tickets is

(a) 7   (b) 5   (c) 36   (d) 6

ANSWERS

1.	(b)	4.	(b)	7.	(c)	10.	(d)
2.	(a)	5.	(d)	8.	(c)	11.	(c)
3.	(d)	6.	(b)	9.	(c)	12.	(d)

CHAPTER-9 BINOMIAL DISTRIBUTION

HOME WORK

1. Seven coins are tossed simultaneously the probability of at least five heads is
   (a) 12/128   (b) 17/128   (c) 21/128   (d) 29/128

2. The probability that a person hits a target is 1/3, the probability that he will hit the target in 3 times out of 5 trials is
   (a) 12/243   (b) 17/243   (c) 40/243   (d) 60/243

3. The probability of a smoker from a group of persons is 2/3. Five persons are selected at random from the group, the probability that at least 4 of them are smokers is
   (a) 112 / 243   (b) 117/243   (c) 221/243   (d) 32/243

4. Assuming that boys and girls are equally probable, the number of families out of 1600 families each having 5 children, with 3 boys are
   (a) 800   (b) 500   (c) 200   (d) 100

5. Assuming that boys and girls are equally probable, the number of families out of 1600 families each having 5 children, with 5 girls are
   (a) 50   (b) 100   (c) 800   (d) 25

6. Assuming that boys and girls are equally probable, the number of families out of 1600 families each having 5 children, with 2 or 3 boys are
   (a) 800   (b) 600   (c) 1000   (d) 100

7. Assuming that boys and girls are equally probable, the number of families out of 1600 families each having 5 children, with all children of the same sex are
   (a) 800   (b) 600   (c) 1000   (d) 100

8. Five dice are thrown simultaneously for 96 times. An even number is regarded as success, the expected frequencies of all five successes are
   (a) 8   (b) 16   (c) 3   (d) 32

9. A and B play a game in which the probability of winning of A is 2/3, the probability that A will win at least 6 times out of 8 trials is
   (a) 512/ 2187   (b) 64/2187   (c) 32/2187   (d) 1024/2187

10. The mean of Binomial distribution is 4 and its variance is 2.4, the value of p is
(a)   0.4   (b)   0.5   (c)   0.3   (d)   0.2

11. The mean of Binomial distribution is 4 and its variance is 2.4, the value of *n* is
(a)   4   (b)   5   (c)   8   (d)   10

12. It is given that on an average it rains for 10 days out of 30 days. The probability that it will rain for at least 3 days in a week is
(a)   219/729   (b)   313/729   (c)   330/729   (d)   335/729

13. A and B play 12 games of chess of which 6 are won by A, 4 by B and 2 end in a tie. They agree to play 3 more games, the probability that A wins all the three games is
(a)   7/8   (b)   5/8   (c)   6/8   (d)   1/8

14. A and B play 12 games of chess of which 6 are won by A, 4 by B and 2 end in a tie. They agree to play 3 more games, the probability that two games end in a tie is
(a)   5/36   (b)   5/72   (c)   5/144   (d)   5/60

15. A and B play 12 games of chess of which 6 are won by A, 4 by B and 2 end in a tie. They agree to play 3 more games, the probability that A and B win alternatively is
(a)   5/36   (b)   5/72   (c)   5/144   (d)   5/60

16. A and B play 12 games of chess of which 6 are won by A, 4 by B and 2 end in a tie. They agree to play 3 more games, the probability that B wins at least one game is
(a)   19/27   (b)   9/27   (c)   9/18   (d)   5/27

17. What is the standard deviation of the number of recoveries among 48 patients when the probability of recovering is 0.75?
(a)   36   (b)   81   (c)   9   (d)   3

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

19. If X ~ B (n, p), what would be the greatest value of the variance of x when n = 16?
(a)   2   (b)   4   (c)   8   (d) $\sqrt{5}$

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

21. If the overall percentage of success in an exam is 60, what is the probability that out of agroup of 4 students, at least one has passed?

    (a)   0.6525   (b)   0.9744   (c)   0.8704   (d)   0.0256

22. If it is known that the probability of a missile hitting a target is 1/8, what is the probabilitythat out of 10 missiles fired, at least 2 will hit the target?

    (a)   0.4258   (b)   0.3968   (c)   0.5238   (d)   0.3611

23. X is a binomial variable such that 2 P(X = 2) = P(X = 3) and mean of X is known to be10/3. What would be the probability that X assumes at most the value 2?

    (a)   16/81   (b)   17/81   (c)   47/243   (d)   46/243

24. In 10 independent rollings of a biased die, the probability that an even number will appear5 times is twice the probability that an even number will appear 4 times. What is theprobability that an even number will appear twice when the die is rolled 8 times?

    (a)   0.0304   (b)   0.1243   (c)   0.2315   (d)   0.1926

ANSWERS

1.	(d)	6.	(c)	11.	(d)	16.	(a)	21.	(b)
2.	(c)	7.	(d)	12.	(b)	17.	(d)	22.	(d)
3.	(a)	8.	(c)	13.	(d)	18.	(b)	23.	(b)
4.	(b)	9.	(d)	14.	(b)	19.	(b)	24.	(a)
5.	(a)	10.	(a)	15.	(a)	20.	(b)		

CHAPTER-10 POISSION DISTRIBUTION

HOME WORK

1. A manufacturer produces switches and experiences that 2 per cent switches are defective. The probability that in a box of 50 switches, there are at most two defective is :

(a) $2e^{-1}$ (b) e^{-1} (c) $2.5e^{-1}$ (d) $3e^{-1}$

2. A person has some cars, and the average demand of cars per day is 3, the probability that on any day not more than 2 cars are in use is $(e^{-3} = 0.0498)$

(a) 0.5533   (b) 0.4233   (c) 0.7533   (d) 0.2533

3. The probability that a match stick is found without head is 1/100. Each match box contains 50 sticks. Using Poisson distribution we can say that the percentage of number of boxes having 0 sticks without head is $(e^{-0.5} = 0.61)$

(a) 40   (b) 51   (c) 61   (d) 25

4. The probability that a match stick is found without head is 1/100. Each match box contains 50 sticks. Using Poisson distribution we can say that the percentage of number of boxes having 1 stick without head is

(a) 40.5   (b) 50.5   (c) 75.5   (d) 30.5

5. The probability that a match stick is found without head is 1/100. Each match box contains 50 sticks. Using Poisson distribution we can say that the percentage of number of boxes having 2 sticks without heads is

(a) 8.5   (b) 7.63   (c) 8.75   (d) 10.25

6. In the production of electric fuses 2% are defective, the probability of getting at the most 2 defective fuses in a box containing 200 fuses is $(e^{-4} = 0.0183)$

(a) 0.238   (b) 0.763   (c) 0.875   (d) 0.252

7. In the production of electric fuses 2% are defective, the probability of getting 3 defective fuses in a box containing 200 fuses is $(e^{-4} = 0.0183)$

(a) 0.2952   (b) 0.1952   (c) 0.3952   (d) 0.4952

8. In the manufacturing of cotter pins it is known that 5% of the pins are defective. The pins are sold in boxes of 100 and it is guaranteed that not more than 4 pins will be defective in a box. What is the probability that a box will meet this guarantee? $(e^{-5} = 0.0067)$

(a) 0.4480   (b) 0.5480   (c) 0.6480   (d) 0.4380

9. If 3% of electric bulbs manufactured by a company are defective, find the probability that in a sample of 100 bulbs, exactly 5 bulbs are defective. $(e^{-3} = 0.0498)$
(a)   0.2952   (b)   0.1008   (c)   0.2008   (d)   0.3008

10. In one hospital 3 percent of the patients demand special rooms. On a particular day 3 special rooms were vacant. If 50 patients were admitted in the hospital on that day, the probability that the demands for special room were not met is $(e^{-1.5} = 0.2231)$
(a)   0.0658   (b)   0.1952   (c)   0.1304   (d)   0.1316

11. In a book, on an average there are 3 misprints in 5 pages. The number of pages having more than 2 misprints in that book of 100 pages are (Use Poisson distribution) $(e^{-0.6} = 0.5488)$
(a)   3.31   (b)   4.31   (c)   2.31   (d)   5.31

12. A factory produces 0.5% defective articles. If a sample of 100 articles is taken from the production, the probability of getting 2 or more defective articles is $(e^{-0.5} = 0.6065)$
(a)   0.0902   (b)   0.1902   (c)   0.1302   (d)   0.1102

13. A random variable x follows Poisson distribution with mean 2 then $P(X > 0)$ is equal to $(e^{-2} = 0.1353)$
(a)   0.1353   (b)   0.2706   (c)   0.8647   (d)   none of them

14. The mean of a Poisson variate is 0.81, then its S.D. is
(a)   0.81   (b)   0.9   (c)   0.8647   (d)   none of them

15. x is a Poisson variate such that $P(x = 3) = P(x = 4)$, mean =
(a)   2   (b)   3   (c)   4   (d)   none of them

16. For a Poisson variate x its $P(x = 1) = P(x = 2)$, variance is
(a)   2   (b)   3   (c)   1   (d)   none of them

17. x is a Poisson variate such that $P(x = 3) = P(x = 4)$, its S.D. is
(a)   4   (b)   3   (c)   2   (d)   none of them

18. If for a Poisson variate x, $P(x = 0) = P(x = 1) = k$, then $k =$
(a)   0.3681   (b)   2.7183   (c)   0.5   (d)   none of them

19. x is a Poisson variate and $P(x = 1) = P(x = 2)$, find $P(x = 0)$ is

    (a) e^{-2} (b) $e^{-0.5}$ (c) e^{-1} (d)   none of them

20. x is a Poisson variate and $P(x = 2) = 9.P(x = 4) + 90.P(x = 6)$ then its mean is

    (a)   4   (b)   3   (c)   1   (d)   none of them

21. The number of accidents in a year attributed to taxi drivers in a city follows poisson distribution with mean 3. Out of 1000 taxi drivers, the number of drivers with no accident in a year is ($e^{-3} = 0.0498$)

    (a)   40   (b)   30   (c)   50   (d)   none of them

22. The number of accidents in a year attributed to taxi drivers in a city follows poission distribution with mean 3. Out of 1000 taxi drivers, the number of drivers with at least 3 accidents in a year is($e^{-3} = 0.0498$)

    (a)   477   (b)   377   (c)   177   (d)   none of them

23. The average number of customers, who appear at a counter of a certain bank per minute is 2, the probability that during a given minute three or more customers appear is ($e^{-2} = 0.1353$)

    (a)   0.32354   (b)   0.1353   (c)   1   (d)   none of them

24. If the standard deviation of a Poisson variate X is 2, what is P $(1.5 < X < 2.9)$?

    (a)   0.231   (b)   0.158.   (c)   0.15.   (d)   0.144.

25. If the mean of a Poisson variable X is 1, what is P (X = takes the value at least 1)?

    (a)   0.456.   (b)   0.821.   (c)   0.632.   (d)   0.254.

26. 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.   (b)   0.982.   (c)   0.989.   (d)   0.976.

27. If for a Poisson variable X, f(2) = 3 f(4), what is the variance of X?

    (a)   2.   (b)   4.   (c) $\sqrt{2}$ (d)   3.

28. A random variable x follows Poisson distribution and its coefficient of variation is 50. What is the value of P $(x > 1 / x > 0)$?

    (a)   0.1876   (b)   0.2341   (c)   0.9254   (d)   0.8756

29. A car hire firm has 2 cars which is hired out every day. The number of demands per dayfor a car follows Poisson distribution with mean 1.20. What is the proportion of days onwhich some demand is refused? (Given $e^{1.20} = 3.32$).

    (a)   0.25   (b)   0.3012   (c)   0.12   (d) 0.03

ANSWERS

1.	(c)	11.	(c)	21.	(c)
2.	(b)	12.	(a)	22.	(d)
3.	(c)	13.	(c)	23.	(a)
4.	(d)	14.	(b)	24.	(d)
5.	(b)	15.	(c)	25.	(c)
6.	(a)	16.	(a)	26.	(b)
7.	(b)	17.	(c)	27.	(a)
8.	(d)	18.	(a)	28.	(c)
9.	(b)	19.	(a)	29.	(c)
10.	(a)	20.	(c)		

CHAPTER-11 NORMAL DISTRIBUTION

HOME WORK

1. An approximate relation between Q.D. and S. D. of normal distribution is :
   (a) 3 Q.D. = 2 S. D.　(b) 4 Q.D. = 5 S. D.
   (c) 2 Q.D = 3 S. D.　(d) 5 Q. D. = 4 S. D.

2. A approximate relation between M. D. about mean and S.D. of a normal distribution is :
   (a) 4 M.D. = 5 S. D.　(b) 5 M.D. = 4 S. D.
   (c) 3 M.D. = 3 S.D.　(d) 3 M.D. = 2 S. D.

3. The area under the standard normal curve beyond the lines ± 1.96 is
   (a) 95%　(b) 90%　(c) 99.73%　(d) 5%

4. If Z is a standard normal variate, the proportion of items lying between Z = – 0.5 and Z = – 3.0 is
   (a) 0.5　(b) 0.1915　(c) 0.3172　(d) 0.3072

5. If X is a normal variate representing the income in ₹ per day with mean = 50 and S.D. = 10 of the workers in a factory. The total number of workers is 1000. The number of workers having income more than ₹ 62.00 per day is
   (a) 246　(b) 150　(c) 738　(d) 115

6. Assume that distribution of diameters of shafts as normal with mean = 5 and S. D. = 0.05. The tolerance limit of shafts is 4.90 to 5.10 cms. In a consignment of 200 shafts, the number of shafts out of tolerance limits is :
   (a) 15　(b) 9　(c) 20　(d) 25
   [Given; z = 2.0, $\varphi(z)=0.4772$]

7. The mean of a normal variate is 20 and its variance is 9. The area between the values of the variate 15.5 and 21.5 is
   (a) 0.6247　(b) 0.2857　(c) 0.0228　(d) 0.9332

8. The mean of a normal variate is 20 and its variance is 9. The area between the values of the variate 14 and 18.5 is
   (a) 0.6247　(b) 0.2857　(c) 0.0228　(d) 0.9332

9. The mean of a normal variate is 20 and its variance is 9. The area for the values of variate more than 26 is
(a)   0.6247   (b)   0.2857   (c)   0.0228   (d)   0.9332

10 . In an intelligence test administered to 1000 children the average score is 42 and its s.d. is 24. Assuming that the scores are normally distributed, the minimum score of the most intelligent 100 students is
(a)   371   (b)   383   (c)   72.7   (d)   none of them

11. The customer accounts at a certain departmental store have an average balance of ₹ 120 and a standard deviation of ₹ 40. Assuming that account balances are normally distributed, what percentage of the accounts are over ₹ 150?
(a)   25.5   (b)   22.66   (c)   72.7   (d)   46.49

12. The customer accounts at a certain departmental store have an average balance of ₹120 and a standard deviation of ₹40. Assuming that account balances are normally distributed,what percentage of the accounts are between ₹100 and ₹150?
(a)   25.5   (b)   22.66   (c)   72.7   (d)   46.49

13. The average life of a battery is 400 hours and its standard deviation is 50 hours. Assuming normal distribution, the percentage of batteries having life more than 350 hours is
(a)   84.13   (b)   22.66   (c)   72.7   (d)   46.49

14. The average life of a battery is 400 hours and its standard deviation is 50 hours. Assuming normal distribution, approximate after how many hours 25% of the batteries will still be working?
(a)   284   (b)   422   (c)   372   (d)   434

15. The average life of a battery is 400 hours and its standard deviation is 50 hours. Assuming normal distribution, the percentage of batteries with life time between 300 and 500 hours is
(a)   84.13   (b)   22.66   (c)   95.44   (d)   19.35

16. In a normal distribution 50% of the observations are less than 35 and 89% of the observations are less than 63. The mean of the distribution is
(a)   63   (b)   35   (c)   89   (d)   none of them

17. In a normal distribution 50% of the observations are less than 35 and 89% of the observations are less than 63. The standard deviation of the distribution is
(a)   63   (b)   35   (c)   89   (d)   none of them

18. The mean and S.D. of a normal variate are 30 and 5 respectively, the probability of $|x - 30| < 5$ is

(a)   0.6826   (b)   0.0013   (c)   0.7653   (d)   none of them

19. The distribution of marks of the students in a class is normal with mean 20 and s.d. 5. The number of students getting more than 25 marks is 50. The number of students of that class is

(a)   682   (b)   653   (c)   315   (d)   none of them

20. What is the coefficient of variation of x, characterised by the following probability density function: $f(x) = \frac{1}{4\sqrt{2\pi}} e^{-(x-10)^2/32}$ for $-\infty < x < \infty$

(a)   50.   (b)   60.   (c)   40.   (d)   30.

21. 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.

22. In a sample of 800 students, the mean weight and standard deviation of weight are found to be 50 kg and 20 kg respectively. On the assumption of normality, what is the number of students weighing between 46 Kg and 62 Kg? Given area of the standard normal curve between z = 0 to z = 0.20 = 0.0793 and area between z = 0 to z = 0.60 = 0.2257.

(a)   250   (b)   244   (c)   240   (d)   260

23. The salary of workers of a factory is known to follow normal distribution with an average salary of ₹ 10,000 and standard deviation of salary as ₹ 2,000. If 50 workers receive salary more than ₹ 14,000, then the total no. of workers in the factory is

(a)   2,193   (b)   2,000   (c)   2,200   (d)   2,500

24. For a normal distribution with mean as 500 and SD as 120, what is the value of k so that the interval [500, k] covers 40.32 per cent area of the normal curve? Given φ (1.30) = 0.9032.

(a)   740   (b)   750   (c)   760   (d)   800

25. 50 per cent of a certain product have weight 60 kg or more whereas 10 per cent haveweight 55 kg or less. On the assumption of normality, what is the variance of weight?

Given φ (1.28) = 0.90.

(a)   15.21   (b)   9.00   (c)   16.00   (d)   22.68

ANSWERS

1.	(a)	**6.**	(b)	**11.**	(b)	**16.**	(b)	**21.**	(c)
2.	(b)	**7.**	(a)	**12.**	(d)	**17.**	(d)	**22.**	(b)
3.	(d)	**8.**	(b)	**13.**	(a)	**18.**	(a)	**23.**	(a)
4.	(d)	**9.**	(c)	**14.**	(d)	**19.**	(c)	**24.**	(c)
5.	(d)	**10.**	(c)	**15.**	(c)	**20.**	(c)	**25.**	(a)

CHAPTER-12 SAMPLING THEORY & THEORY OF ESTIMATION
HOME WORK

1. Sampling is compulsory in the situation(s)
   (a) blood test of a person   (b) when the population is infinite
   (c) testing of life of tyre   (d) all the above

2. A sample consists of
   (a) 50% units of the population   (b) 1% units of the population
   (c) 10% units of the population   (d) any fraction of the population

3. A population is perfectly homogeneous in respect of a characteristic. What size of sample would you prefer?
   (a) 10% of population   (b) 5% of population
   (c) A single item   (d) No item

4. The selected items of a sample resulted into same values pertaining to a character. The variance of the sample is
   (a) 1   (b) 0   (c) 8   (d) not determinable

5. If the respondents do not supply the required information, this problem is known as
   (a) the problem of the non-response   (b) non-sampling error
   (c) both (a) and (b)   (d) none of (a) and (b)

6. The number of possible samples of size n out of population of N units without replacement is
   (a) $_NC_n$ (b) $(N)^n$ (c) n^N (d) ∞

7. Probability of drawing a unit at each selection remains same in
   (a) SRSWR   (b) SRSWOR   (c) both   (a) & (b) (d) none of them

8. Probability of selection varies at each subsequent draw in
   (a) sampling without replacement   (b) sampling with replacement
   (c) both (a) and (b)   (d) neither (a) nor (b)

9. A population consisting of all natural numbers is an example of
   (a) an infinite population   (b) a finite population
   (c) an imaginary population   (d) none of the above

10. An unordered sample of size n can occur in
   (a) n^N ways   (b) n! ways   (c) one way   (d) N^n ways

11. Probability of any one sample of size n being drawn out of N units is :
    (a) n/N   (b) 1/N   (c) N/n!   (d) None

12. Probability of including a specified unit in a sample of size n selected out of N units is :
    (a) l/N   (b) l/n   (c) n/N   (d) none of them

13. A selection procedure of a sample having no involvement of probability is known as
    (a) Judgment sampling   (b) Subjective sampling
    (c) Purposive sampling   (d) all the above

14. In simple random sampling with replacement, the same sampling unit may be included in the sample.
    (a) once only   (b) more than once
    (c) twice only   (d) none of the above

15. A population consisting of all the items which are physically present is called :
    (a) infinite population   (b) real population
    (c) hypothetical population   (d) none of the above

16. In a sample of 100 items 10 are found to be defective. The 95% confidence limits for the population proportion of defective items are
    (a) 0.02 to 0.10   (b) 0.08 to 0.26
    (c) 0.04 to 0.16   (d) none of them

17. A random sample of size 65 was taken to estimate the mean annual income of 1000 families and mean and S.D. were found to be Rs. 6300 and 9.5. The 95 % confidence interval for the population mean is
    (a) 6000 to 6600   (b) 6302 to 6298
    (c) 5600 to 6500   (d) none of them

18. The mean weight of a random sample of size 100 from students' population is 65.8 kgs and the S.D. is 4. The 95% confidence interval for the mean weight of students' population is
    (a) 65 to 66.6   (b) 64 to 68
    (c) 60 to 70   (d) none of them

19. A random sample of 160 people is taken and 120 were in favour of liberalizing licensing regulations. With 95% confidence, what proportion of all people are in favour?
    (a)0.50 to 0.75 (b) 0.40 to 0.55   (c)0.68 to 0.82   (d) none of them

20. In a large consignment of oranges a random sample of 500 oranges revealed that 65 oranges were bad. 99.73% of bad oranges in the consignment certainly lies between

(a)   8.5 % and 17.5 %   (b)   5.5% to 10%

(c)   8.5% to 12.5%   (d)   none of them

21. Circular systematic sampling is used as :

(a) N is a multiple of n   (b) N is a whole number

(c) N is not divisible by n (d)   none of the above

22. Which of the following advantage of systematic sampling you approve?

(a)   Easy selection of sample   (b)   Economical

(c)   Spread of sample over the whole population   (d)   All the above

23. Selected units of a systematic sample are

(a)   not representing the whole population   (b)   easily locatable

(c)   not easily locatable   (d)   all the above

24. A systematic sample does not yield good results if

(a) units at regular intervals are correlated (b) variation in units is periodic

(c) both (a) and (b)   (d) none of (a) and (b)

25. Greatest drawback of systematic sampling is that

(a) one requires a large sample'

(b) data are not easily accessible

(c) no single reliable formula for standard deviation

(d) none of the above

26. Which of the following statements is true ?

(a) Population mean increases with the increase in sample size

(b) Population mean decreases with increase in sample size

(c) Population mean decreases with the decrease in sample size

(d) Population mean is a constant value

27. Which of the following statements does not hold good ?

(a) An increase in sample size reduces the standard error

(b) An increase in sample size decreases the sampling error

(c) Decrease in sample size results in the reduction of population standard deviation

(d) The precision of an estimate depends on sample size

28. A sample of 16 items from an infinite population having S.D. = 4, yielded total scores as 160. The standard error of sampling distribution of mean is :
(a)　1　　　　(b)　10　　　　(c)　40　　(d)　none of the above

29. A random sample of 100 articles selected from a batch of 2000 articles shows that the average diameter of the articles is 0.354 with a S.D. 0.048. The 95% confidence interval for the average of this batch of 2000 articles is
(a)　0.25 to 0.30　　　(b)　0.20 to 0.30
(c)　0.35 to 0.36　　　(d)　none of them

30. Mr. X wants to determine on the basis of sample study the mean time required to complete a certain job so that he may be 95% confident that the mean may remain within ± 2 days of the true mean. As per the available record the population variance is 64 days. How large should be the sample for this study?
(a)　200　　　(b)　100　　　(c)　62　　(d)　none of them

31. A pathologist wants to determine on the basis of sample study the mean time required to complete a certain analysis so that he may be 98% confident that the mean may remain within ± 3 days of the true mean. As per the available record the population variance is 81 days. What must be the size of the sample for the study?
(Value of Z corresponding to 98% confidence interval is 2.33)
(a)　49　　　(b)　100　　　(c)　60　　(d)　none of them

32. With a sample of 400, the calculated standard error of mean is 2 with a mean of 120. What sample size would be required so that we would be 95%, confident that the population mean is within 3.5 of the sample mean?
(a)　200　　　(b)　100　　　(c)　502　　　(d)　none of them

33. Mr. X wants to determine the average time to complete a certain job. The past records show that population standard deviation is 10 days. Determine the sample size so that Mr. X may be 95% confident that the sample average remains within ± 2 days of the average.
(Critical value of 'z' at 95% confidence is 1.96 from standard normal area table)
(a)　96　　　(b)　120　　　(c)　106　　　(d)　none of them

34. If the observations recorded on five sampled items are 3,4, 5,6, 7 the sample variance is
(a)　3.5　　　(b)　0　　　(c)　2.5　　　(d)　4.5

35 Which of following statement is true ?
(a)　Less the standard error, better it is
(b)　More the standard error, better it is
(c)　standard error is always zero
(d)　standard error is always unity

36. Which of the following statement is true?
    (a)   standard error cannot be zero   (b)   standard error must be 1
    (c)   standard error cannot be negative   (d)   all the above

37. If sample mean is 20, population standard deviation is 3 and sample size is 64, the interval estimate of mean is
    (a)   22.5 to 25.5 (b)   20 to 22.5   (c)   19.3 to 20.7 (d)   none of them

38. A random sample of 100 gave a mean of 7.4 kg and a standard deviation of 1.2 kg. The 95% confidence limits for the population mean is
    (a)   7.2 to 7.6   (b)   8.2 to 9.2   (c)   5.2 to 6.2   (d)   none of them

39. A pharmaceutical company wants to estimate the mean life of a particular drug under typical weather conditions. Following results were obtained from a random sample of 64 bottles of the drug :
Sample mean   20 months
Population S.D.   3 months
Sample size   64
An interval estimate with a confidence level of 95% is
    (a)   19.4 to 21   (b)   19.3 to 20.7 (c)   19 to 21   (d)   none of them

40. The errors in a survey other than sampling errors are called
    (a)   sampling errors   (b)   planning error
    (c)   non-sampling error   (d)   none of the above

41. A function of variates for estimating a parameter is called :
    (a)   estimate   (b)   estimator   (c)   statistic   (d)   none of them

42. An estimator can possess
    (a)   value of parameter   (b)   any value
    (c)   both (a) and (b)   (d)   neither (a) nor (b)

43. The most important factor in determining the size of a sample is
    (a)   the availability of resources   (b)   purpose of the survey
    (c)   heterogeneity of population   (d)   none of the above

44. If the items are destroyed under investigation, we have to go for
    (a)   complete enumeration   (b)   sampling studies
    (c)   both (a) and (b)   (d)   neither (a) nor (b)

45. Stratified sampling comes under the category of
    (a)   unrestricted sampling   (b)   subjective sampling
    (c)   purposive sampling   (d)   restricted sampling

46. Systematic sampling means
(a)   selection of *n* continuous units
(b)   selection of *n* units situated at equal distances
(c)   selection of *n* largest units
(d)   selection of *n* middle units in a sequence.

47. If the number of population units *N* is an integral multiple of sampling size *n*, the systematic sampling is called :
(a)   linear systematic sampling   (b)   circular systematic sampling
(c)   random systematic sampling   (d)   all the above

48. According to Neyman's allocation, in stratified sampling
(a) Sample size is proportional to the population size
(b) Sample size is proportional to the sample SD
(c) Sample size is proportional to the sample variance
(d) Population size is proportional to the sample variance.

49. For an unknown parameter, how many interval estimates exist?
(a)   Only one   (b)   Two   (c)   Three   (d)   Many

50. The most commonly used confidence interval is
(a)   95 percent   (b)   90 percent (c)   94 percent (d)   98 percent.

51. If n numbers are drawn at random without replacement from the set {1,2, 3,...,m} then $\overline{var}(x)$ would be
(a)   (m+1) (m–n)/12n   (b)   (m–1) (m+ n)/12
(c)   (m–1) (m +n)/12n   (d)   (m–1) (m+n) / 12m

52. 8 Life Insurance Policies in a sample of 100 taken out of 20,000 policies were found to be insured for less than ₹10,000. How many policies in the whole lot can be expected to be insured for less than ₹ 10,000 at 95% confidence level?
(a)   1050 and 2150   (b)   536 and 2664
(c)   1040 and 2160   (d)   1023 and 2057

53. A Life Insurance Company has 1500 policies averaging ₹ 2000 on lives at age 30. From experience, it is found that out of 100,000 alive at age 30, 99,000 survive at age 31. What is the lower value of the amount that the company will have to pay in insurance during the year?
(a)   ₹ 6879   (b)   ₹ 8000   (c)   ₹ 8200   (d)   ₹ 8500

54. Under ——————— method selection is often based on certain predetermined criteria.
(a) Block or Cluster sampling
(b) Area sampling
(c) Quota sampling
(d) Deliberate, purposive or judgment sampling.

55. ——————— sampling is similar to cluster sampling.
(a)   Judgment   (b)   Quota   (c)   Area   (d)   none

56. A ——————— distribution is a theoretical distribution that expresses the functional relation between each of the distinct values of the sample statistic and the corresponding probability.
(a)   normal   (b)   Binomial   (c)   Poisson   (d)   sampling.

57. Sampling distribution is a frequency distribution.
(a)   true   (b)   false   (c)   both   (d)   none

58. Sampling distribution approaches ——————— distribution when the population distribution is not normal provided the sample size is sufficiently large.
(a)   Binomial   (b)   Normal   (c)   Poisson   (d)   none

59. The sample standard deviation may be a good estimate for population standard deviation in case of ——————— samples.
(a)   small   (b)   moderately sized   (c)   large   (d)   none

60. The sample standard deviation is a biased estimator of population standard deviation in case of ——————— samples.
(a)   small   (b)   moderately sized   (c)   large   (d)   none

61. For 2 sample values, we have ———————— degree of freedom.
(a)   2   (b)   1   (c)   3   (d)   4

62. For 5 sample values, we have ———————— degree of freedom.
(a)   5   (b)   3   (c)   4   (d)   none

63. The procedures for determining the sample size for estimating a population proportionare similar to those of estimating a population mean. In this case we must know ——————— factors.
(a)   2   (b)   5   (c)   4   (d)   3

64. In determining the sample size for estimating a population mean, the number of factorsmust be known is
(a)   2   (b)   3   (c)   5   (d)   4

65. In audit test Statistical Sampling methods are used.

    (a)   true   (b)   false   (c)   both   (d)   none

66. Single, double, multiple and sequential are several types of

    (a)   Discovery sampling method   (b)   Acceptance sampling method

    (c)   both   (d)   none

67. _____ sampling is absolutely free from the influence of human bias

    (a)   multi – stage   (b)   Random   (c)   purposive   (d)   none

ANSWERS

1.	(d)	**13.**	(d)	**25.**	(c)	**37.**	(c)	**49.**	(d)	**61.**	(b)
2.	(d)	**14.**	(b)	**26.**	(d)	**38.**	(a)	**50.**	(a)	**62.**	(c)
3.	(c)	**15.**	(b)	**27.**	(c)	**39.**	(b)	**51.**	(a)	**63.**	(d)
4.	(b)	**16.**	(c)	**28.**	(a)	**40.**	(c)	**52.**	(b)	**64.**	(b)
5.	(a)	**17.**	(b)	**29.**	(c)	**41.**	(b)	**53.**	(a)	**65.**	(a)
6.	(a)	**18.**	(a)	**30.**	(c)	**42.**	(b)	**54.**	(d)	**66.**	(b)
7.	(a)	**19.**	(c)	**31.**	(a)	**43.**	(c)	**55.**	(c)	**67.**	(b)
8.	(a)	**20.**	(a)	**32.**	(c)	**44.**	(b)	**56.**	(d)		
9.	(a)	**21.**	(c)	**33.**	(a)	**45.**	(d)	**57.**	(a)		
10.	(b)	**22.**	(d)	**34.**	(c)	**46.**	(b)	**58.**	(b)		
11.	(d)	**23.**	(b)	**35.**	(a)	**47.**	(a)	**59.**	(c)		
12.	(a)	**24.**	(c)	**36.**	(c)	**48.**	(a)	**60.**	(a)		