

(ii) Choose the most suitable answer from the given four alternatives and write the option code and the corresponding answer.

42x1=42

- If the ordered pairs  $(a+2, 4)$  and  $(5, 2a+b)$  are equal then  $(a,b)$  is  
(a)  $(2, -2)$       (b)  $(5, 1)$       (c)  $(2, 3)$       (d)  $(3, -2)$
- If  $f: A \rightarrow B$  is a bijective function and if  $n(B) = 7$ , then  $n(A)$  is equal to  
(a) 7      (b) 49      (c) 1      (d) 14
- If  $n(A) = p$ ,  $n(B) = q$ , then the total number of relations that exist between  $A$  and  $B$  is  
(a)  $q^p$       (b)  $p^q$       (c)  $2^{pq}$       (d)  $pq^2$
- If two or more elements of  $A$  have same images in  $B$ , then the function  $f: A \rightarrow B$  is called  
(a) one-one function      (b) many-one function      (c) onto function      (d) into function
- The next term of the sequence  $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \dots$  is  
(a)  $\frac{1}{24}$       (b)  $\frac{1}{27}$       (c)  $\frac{2}{3}$       (d)  $\frac{1}{81}$
- The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is  
(a) 2025      (b) 5220      (c) 5025      (d) 2520
- Two positive integers are said to be co-prime if their HCF is  
(a) 0      (b) Not defined      (c) HCF = LCM      (d) 1
- 1, 3, 5, 7, .... is a sequence with general term  $a_n =$   
(a)  $\frac{1}{n+2}$       (b)  $n+2$       (c)  $2n-1$       (d)  $2n$
- If three non-zero numbers  $a, b, c$  are in G.P. if and only if  
(a)  $b^2 = ac$       (b)  $ar^{n-1}$       (c)  $b^2 = a+c$       (d)  $ab=bc$
- The slope of the line which is perpendicular to line joining the points  $(0,0)$  and  $(-8,8)$  is  
(a)  $-1$       (b) 1      (c) 13      (d)  $-8$
- The area of triangle formed by the points  $(-5,0)$ ,  $(0,-5)$  and  $(5,0)$  is  
(a) 0 sq.units      (b) 25 sq.units      (c) 5 sq.units      (d) none of these
- The inclination of  $Y$  axis and every line parallel to  $Y$  axis is  
(a)  $0^\circ$       (b)  $60$       (c)  $90^\circ$       (d)  $180^\circ$
- Two non-vertical lines are parallel if and only if their slopes are  
(a) same line      (b) equal      (c) equal to  $-1$       (d) none of these
- Two straight lines  $a_1x + b_1y + c_1 = 0$  and  $a_2x + b_2y + c_2 = 0$  are perpendicular  
(a)  $a_1a_2 + b_1b_2 = 0$       (b)  $a_1b_2 - a_2b_1 = 0$       (c)  $a_1a_2 - b_1b_2 = 0$       (d)  $a_1b_2 + a_2b_1 = 0$

15. If  $(x-6)$  is the HCF of  $x^2 - 2x - 24$  and  $x^2 - kx - 6$  then the value of  $k$  is  
 (a) 3 (b) 5 (c) 6 (d) 8
16. If  $A$  is a  $2 \times 3$  matrix and  $B$  is a  $3 \times 4$  matrix, how many columns does  $AB$  have  
 (a) 3 (b) 4 (c) 2 (d) 5
17. A rational expression  $p(x)$  is said to be in its lowest form if  $\text{GCD}(p(x), q(x)) =$   
 (a) 2 (b) 0 (c) 1 (d) none of these
18.  $y^2 + \frac{1}{y^2}$  is not equal to  
 (a)  $\frac{y^4+1}{y^2}$  (b)  $(y - \frac{1}{y})^2 + 2$  (c)  $(y + \frac{1}{y})^2 - 2$  (d)  $(y + \frac{1}{y})^2$
19. If the roots of the equation  $q^2x^2 + p^2x^2 + r^2 = 0$  are the squares of the roots of the equation  $qx^2 + px + r = 0$ , then  $q, p, r$  are in \_\_\_\_\_  
 (a) A.P (b) G.P (c) Both A.P and G.P (d) None of these
20. If  $A$  is a  $2 \times 3$  matrix and  $B$  is a  $3 \times 4$  matrix, how many columns does  $AB$  have  
 (a) 3 (b) 4 (c) 2 (d) 5
21. Transpose of a column matrix is  
 (a) unit matrix (b) diagonal matrix (c) column matrix (d) row matrix
22. Discriminant the nature root, if  $\Delta < 0$  the roots are  
 (a) real (b) real and equal (c) real and unequal (d) no real
23. A matrix has only one column it is called as a  
 (a) row matrix (b) column matrix (c) unit matrix (d) scalar matrix
24. The ratio of the volumes of a cylinder, a cone and a sphere, if each has the same diameter and same height is  
 (a) 1:2:3 (b) 2:1:3 (c) 1:3:2 (d) 3:1:2
25. The total surface area of a hemi-sphere is how much times the square of its radius  
 (a)  $\pi$  (b)  $4\pi$  (c)  $3\pi$  (d)  $2\pi$
26. If the radius of the base of a cone is tripled and the height is doubled then the volume is  
 (a) made 6 times (b) made 18 times (c) made 12 times (d) unchanged
27. The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be  
 (a) 12 cm (b) 10 cm (c) 13 cm (d) 5 cm
28. The curved surface area of a right circular cone of height 15 cm and base diameter 16 cm is  
 (a)  $60\pi \text{ cm}^2$  (b)  $68\pi \text{ cm}^2$  (c)  $120\pi \text{ cm}^2$  (d)  $136\pi \text{ cm}^2$

29. In  $\triangle LMN$ ,  $\angle L = 60^\circ$ ,  $\angle M = 50^\circ$ , if  $\triangle LMN \sim \triangle PQR$  then the value of  $\angle R$  is  
 (a)  $40^\circ$  (b)  $70^\circ$  (c)  $30^\circ$  (d)  $110^\circ$
30. If in  $\triangle ABC$ ,  $DE \parallel BC$ .  $AB = 3.6$  cm,  $AC = 2.4$  cm and  $AD = 2.1$  cm then the length of  $AE$  is  
 (a)  $1.4$  cm (b)  $1.8$  cm (c)  $1.2$  cm (d)  $1.05$  cm
31. A tangent is perpendicular to the radius at the  
 (a) centre (b) point of contact (c) infinity (d) chord
32. The two tangents from an external points  $P$  to a circle with centre at  $O$  are  $PA$  and  $PB$ . If  $\angle APB = 70^\circ$ , then the value of  $\angle AOB$  is  
 (a)  $100^\circ$  (b)  $110^\circ$  (c)  $120^\circ$  (d)  $130^\circ$
33. The angle of elevation of a cloud from a point  $h$  metres above a lake is  $\beta$ . The angle of depression of its reflection in the lake is  $45^\circ$ . The height of location of the cloud from the lake is  
 (a)  $\frac{h(1+\tan\beta)}{1-\tan\beta}$  (b)  $\frac{h(1-\tan\beta)}{1+\tan\beta}$  (c)  $h \tan(45^\circ - \beta)$  (d) None of these
34.  $(1 + \tan \theta + \sec \theta)(1 + \cot \theta - \operatorname{cosec} \theta)$  is equal to  
 (a) 0 (b) 1 (c) 2 (d) -1
35. If  $5x = \sec \theta$  and  $\frac{5}{x} = \tan \theta$ , then  $x^2 - \frac{1}{x^2}$   
 (a) 25 (b)  $\frac{1}{25}$  (c) 5 (d) 1
36. A tower is  $60$  m height. Its shadow is  $x$  metres shorter when the sun's altitude is  $45^\circ$  than when it has been  $30^\circ$ , then  $x$  is equal to  
 (a)  $41.92$  m (b)  $43.92$  m (c)  $43$  m (d)  $45.6$  m
37. The value of  $\sin^2\theta + \frac{1}{1+\tan^2\theta}$  is equal to  
 (a)  $\tan^2\theta$  (b) 1 (c)  $\cot^2\theta$  (d) 0
38. The range of first 10 prime numbers is  
 (a) 9 (b) 10 (c) 27 (d) 25
39. If A and B are said to be mutually exclusive events if  $A \cap B =$   
 (a)  $B \cap A$  (b)  $\emptyset$  (c) 0 (d) none of these
40. The probability of sure event is  
 (a) 1 (b) 0 (c) 2 (d)  $\emptyset$
41. The probability value always lies from  
 (a) 0 (b) 1 (c)  $\emptyset$  (d) none of these
42. If 'S' is the standard deviation of values  $p, q, r$  then standard deviation of  $p-3, q-3, r-3$  is  
 (a)  $S-3$  (b)  $S+3$  (c)  $S$  (d)  $S-9$

II. Answer the following:

1x8=8

43. a) Draw the graph of  $y=x^2+4x+3$  and hence find the roots of  $x^2+x+1=0$

(or)

- b) Draw the graph of  $y=2x^2$  and hence solve  $2x^2-x-6=0$