FIRST REVISION TEST - 2024

Standard X

MATHEMATICS

Reg.No. | | | | | | |

B

Time : 3.00 hrs *Marks : 100*

Part - I **14 x 1 = 14**

I. Choose the correct answer:

1. 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)

2. If $f(x) = 2x^2$ and $g(x) = \frac{1}{3x}$, then fog is
   a) $\frac{3}{2x^2}$ b) $\frac{2}{3x^2}$ c) $\frac{2}{9x^2}$ d) $\frac{1}{6x^2}$

3. The sum of exponents of the prime factors in the prime factorization of 144 is
   a) 4 b) 5 c) 6 d) 3

4. An A.P consists of 31 terms. If its 16^{th} term is m, then the sum of all the terms of this A.P is
   a) 16 m b) 62 m c) $31\frac{1}{2}$ m d) 31 m

5. If $ax^2 + bx + c = 0$ has equal roots, then c is equal to
   a) $\frac{b^2}{2a}$ b) $\frac{b^2}{4a}$ c) $-\frac{b^2}{2a}$ d) $-\frac{b^2}{4a}$

6. For the given matrix $A = \begin{pmatrix} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \\ 9 & 11 & 13 & 15 \end{pmatrix}$ the order of the matrix A^T is
   a) 2 x 3 b) 3 x 2 c) 3 x 4 d) 4 x 3

7. In a ΔABC, AD is the bisector of $\angle BAC$. If AB = 8 cm, BD = 6 cm and DC = 3 cm. The length of the side AC is
   a) 6 cm b) 4 cm c) 3 cm d) 8 cm

8. The slope of the line joining (12,3), (4,a) is $\frac{1}{8}$. The value of 'a' is
   a) 1 b) 4 c) –5 d) 2

9. Two straight lines $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ where the co-efficients are non-zero, then the condition for perpendicular
   a) $a_1b_2 - a_2b_1 = 0$ b) $a_1a_2 - b_1b_2 = 0$
   c) $a_1a_2 + b_1b_2 = 0$ d) $\frac{a_1}{a_2} = \frac{b_1}{b_2}$

10. $\tan\theta \operatorname{cosec}^2\theta - \tan\theta$ is equal to
    a) $\sec\theta$ b) $\cot^2\theta$ c) $\sin\theta$ d) $\cot\theta$

11. The curved surface area of a right circular cone of height 15 cm and base diameter 16 cm is

a) $60\ \pi\ cm^2$ b) $68\ \pi\ cm^2$ c) $120\ \pi\ cm^2$ d) $136\ \pi\ cm^2$

12. A funnel has the shape of the combination of

a) a cone and a cylinder b) frustum of a cone and a cylinder

c) a sphere and a cylinder d) frustum of a cone and a hemi phere

13. The range of the data 8, 8, 8, 8, ... 8 is

a) 0 b) 1 c) 8 d) 3

14. Which of the following is incorrect?

a) $P(A) > 1$ b) $0 \le P(A) \le 1$

c) $P(\phi) = 0$ d) $P(A) + P(\bar{A}) = 1$

Part - II

II. Answer any 10 questions. (Q.No.28 is compulsory) $10 \times 2 = 20$

15. If $A \times B = \{(3,2), (3,4), (5,2), (5,4)\}$, then find A and B.

16. Find k if fo $f(k) = 5$ where $f(k) = 2k - 1$

17. Find the greatest number that will divide 445 and 572 leaving remainders 4 and 5 respectively.

18. Find the sum $3 + 1 + \frac{1}{3} + \ldots\ldots\infty$

19. Find the value of $3A - 9B$ if $A = \begin{pmatrix} 0 & 4 & 9 \\ 8 & 3 & 7 \end{pmatrix}$ and $B = \begin{pmatrix} 7 & 3 & 8 \\ 1 & 4 & 9 \end{pmatrix}$.

20. If $\Delta ABC \sim \Delta DEF$ such that area of ΔABC is 9 cm^2 and the area of ΔDEF is 16 cm^2 and BC = 2.1 cm. Find the length of EF.

21. A man goes 18 m due east and then 24 m due north. Find the distance of his current position from the starting point.

22. Find the equation of a line passing through the point (3,–4) and having slope $-5/7$.

23. Prove that $\sec\theta - \cos\theta = \tan\theta \sin\theta$

24. If the base area of a hemispherical solid is 1386 sq.m, then find its total surface area?

25. An aluminium sphere of radius 12 cm is melted to make a cylinder of radius 8 cm. Find the height of the cylinder.

26. Find the range and co-efficient of range of the following data :

25, 67, 48, 53, 18, 39, 44

27. If P(A) = 0.37, P(B) = 0.42, P(A∩B) = 0.09, then find P(A∪B).

28. Find the excluded value of the expression $\frac{x^2+6x+8}{x^2+x-2}$

Part - III

III. Answer any 10 questions. (Q.No.42 is compulsory) **10 x 5 = 50**

29. Let A = {1,2,3,4} and B = {2,5,8,11,14} be two sets. Let f : A→B be a function given by f(x) = 3x – 1. Represent this function
    i) by arrow diagram
    ii) in a table form
    iii) as a set of ordered pairs
    iv) in a graphical form

30. Find x if gff(x) = fgg(x), given f(x) = 3x + 1 and g(x) = x + 3

31. The sum of first n, 2n and 3n terms of an A.P are S_1, S_2 and S_3 respectively. Prove that $S_3 = 3(S_2 - S_1)$

32. Rekha has 15 square colour papers of sides 10 cm, 11 cm, 12 cm ..... 24 cm. How much area can be decorated with these colour papers?

33. If $9x^4 + 12x^3 + 28x^2 + ax + b$ is a perfect square, find the values of a and b

34. If $A = \begin{pmatrix} 3 & 1 \\ -1 & 2 \end{pmatrix}$, show that $A^2 - 5A + 7I_2 = 0$

35. State and prove Thales theorem.

36. Find the area of the quadrilateral formed by the points (8,6), (5,11), (–5,12) and (–4,3).

37. A line makes positive intercepts on co-ordinate axes whose sum is 7 and it passes through (–3,8). Find its equation.

38. Show that $\left(\frac{1+\tan^2 A}{1+\cot^2 A}\right) = \left(\frac{1-\tan A}{1-\cot A}\right)^2$

39. From the top of a 12 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 30°. Determine the height of the tower.

40. A capsule is in the shape of a cylinder with two hemisphere stuck to each of its ends. If the length of the entire capsule is 12 mm and the diameter of the capsule is 3 mm, how much medicine it can hold?

41. The marks scored by the students in a slip test are given below. Find the standard deviation of their marks.

x	4	6	8	10	12
f	7	3	5	9	5

42. Two dice are rolled together. Find the probability of getting a doublet or sum of faces as 4.

Part - IV

IV. Answer all the questions. **2x8=16**

43. a) Take a point which is 11 cm away from the centre of a circle of radius 4 cm and draw the two tangents to the circle from that point.

(OR)

b) Construct a triangle ΔPQR such that QR = 5 cm, ∠P = 30° and the altitude from P to QR is of a length 4.2 cm.

44. a) Draw the graph of xy = 24, x, y > 0. Using the graph, find

i) y when x = 3 and ii) x when y = 6

(OR)

b) Draw the graph of $y = x^2 + 3x - 4$ and hence use it to solve $x^2 + 3x - 4 = 0$

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