

RS2

SECOND REVISION EXAMINATION - 2025

10 - Std

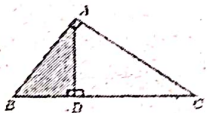
MATHEMATICS

TIME : 3.00 Hrs

MARKS : 100

I CHOOSE THE CORRECT ANSWER:

14 X 1 = 14

1. If $n(A \times B) = 6$ and $A = \{1, 3\}$ then $n(B)$ is
 (a) 1 (b) 2 (c) 3 (d) 6
2. If $\{(a, 8), (6, b)\}$ represents an identity function, then the value of a and b are respectively
 (a) (8, 6) (b) (8, 8) (c) (6, 8) (d) (6, 6)
3. The 8th term of the sequence 1, 1, 2, 3, 5, 8, ... is
 (a) 25 (b) 24 (c) 23 (d) 21
4. The value of $(1^3 + 2^3 + 3^3 + \dots + 15^3) - (1 + 2 + 3 + \dots + 15)$ is
 a) 14400 b) 14200 c) 14280 d) 14520
5. The solution of the system $x + y - 3z = -6$, $-7y + 7z = 7$, $3z = 9$ is
 (a) $x = 1, y = 2, z = 3$ (b) $x = -1, y = 2, z = 3$
 (c) $x = -1, y = -2, z = 3$ (d) $x = 1, y = -2, z = 3$
6. The sum of two zeros of the polynomial $f(x) = 2x^2 + (p + 3)x + 5$ is zero then the value of p is (a) 3 (b) 4 (c) -3 (d) -4
7.  In the adjacent figure $\angle BAC = 90^\circ$ and $AD \perp BC$ then
 (a) $BD \cdot CD = BC^2$ (b) $AB \cdot AC = BC^2$ (c) $BD \cdot CD = AD^2$ (d) $AB \cdot AC = AD^2$
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. The x and y intercepts of the line $2x - 3y + 6 = 0$ respectively are
 (a) -2, 3 (b) 3, 2 (c) -3, 2 (d) 3, -2
10. If $(\sin\alpha + \operatorname{cosec}\alpha)^2 + (\cos\alpha + \operatorname{sec}\alpha)^2 = k + \tan^2\alpha + \cot^2\alpha$, then the value of k is equal to
 (a) 9 (b) 7 (c) 5 (d) 3

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11. The curved surface area of a right circular cylinder whose radius is 'a' units and height is 'b' units is equal to
 (a) $\pi a^2 b$ sq.units (b) $2\pi ab$ sq.units (c) 2π sq.units (d) 2 sq.units
12. The volume (in cm^3) of the greatest sphere that can be cut off from a cylindrical log of wood of base radius 1 cm and height 5 cm is
 (a) $\frac{4\pi}{3}$ (b) $\frac{10\pi}{3}$ (c) 5π (d) $\frac{20\pi}{3}$
13. If the standard deviation of x, y, z is p then the standard deviation of $3x + 5$, $3y + 5$, $3z + 5$ is (a) $3p + 5$ (b) $3p$ (c) $p + 5$ (d) $9p + 15$
14. The probability of getting a job for a person is $\frac{x}{3}$. If the probability of not getting the job is $\frac{2}{3}$ then the value of x is
 (a) 2 (b) 1 (c) 3 (d) 1.5

II ANSWER ANY 10 QUESTIONS. QUESTION NO.28 IS COMPULSORY: 10 X 2 = 20

15. Represent the given relation by (i) an arrow diagram (ii) a set in roster form, wherever possible. $\{(x, y) \mid x = 2y, x \in \{2, 3, 4, 5\}, y \in \{1, 2, 3, 4\}\}$.
16. Let $A = \{1, 2, 3, 4\}$ and $B = N$. Let $f: A \rightarrow B$ defined $f(x) = x^3$ then,
 (i) find the range of f (ii) identify the type of function.
17. Find the indicated terms of the sequences whose n^{th} terms is given by $a_n = \frac{5n}{n+2}$; a_6 and a_{13}
18. Find the excluded values of the expression $\frac{7p+2}{8p^2+13p+5}$.
 Verify that $A^2 = I$ when $A = \begin{pmatrix} 5 & -4 \\ 6 & -5 \end{pmatrix}$
20. In ΔABC , D and E are points on the sides AB and AC respectively such that $DE \parallel BC$ (i) If $\frac{AD}{DB} = \frac{3}{4}$ and $AC = 15$ cm and find AE.
21. Find the equation of a line through the given pair of points (2, 3) and (-7, -1).
22. If the straight lines $12y = -(p+3)x + 12$, $12x - 7y = 16$ are perpendicular then find 'p'.

23. Prove that $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} = \operatorname{cosec}\theta + \cot\theta$.
24. Find the diameter of a sphere whose surface area is 154m^2 .
25. If the ratio of radii of two spheres is $4 : 7$, find the ratio of their volumes.
26. The standard deviation and mean of a data are 6.5 and 12.5 respectively. Find the coefficient of variation.
27. A coin is tossed thrice. What is the probability of getting two consecutive tails?
28. If two positive integers p and q are written as $p = a^2 b^3$ and $q = a^3 b$, a, b are prime numbers then verify $\text{LCM}(p, q) \times \text{GCD}(p, q) = pq$.
- III ANSWER ANY 10 QUESTIONS. QUESTION NO.42 IS COMPULSORY: $10 \times 5 = 50$**
29. Let $A = \{x \in W \mid x < 2\}$, $B = \{x \in N \mid 1 < x \leq 4\}$ and $C = \{3, 5\}$. Verify that $A \times (B \cap C) = (A \times B) \cap (A \times C)$.
30. The function 't' which maps temperature in Celsius (C) into temperature in Fahrenheit (F) is defined by $t(C) = F$ where $F = \frac{9}{5}C + 32$. Find, (i) $t(0)$ (ii) $t(28)$ (iii) $t(-10)$ (iv) the value of C when $t(C) = 212$ (v) the temperature when the Celsius value is equal to the Fahrenheit value.
31. The houses of a street are numbered from 1 to 49. Senthil's house is numbered such that the sum of numbers of the houses prior to Senthil's house is equal to the sum of numbers of the houses following Senthil's house. Find Senthil's house number?
32. Rekha has 15 square colour papers of sizes 10cm, 11cm, 12cm, ... 24cm. How much area can be decorated with these colour papers?
33. Solve the following system of linear equations in three variables $x + y + z = 5$; $2x - y + z = 9$; $x - 2y + 3z = 16$.
34. If $A = \begin{pmatrix} 5 & 2 & 9 \\ 1 & 2 & 8 \end{pmatrix}$, $B = \begin{pmatrix} 1 & 7 \\ 1 & 2 \\ 5 & -1 \end{pmatrix}$ Verify that $(AB)^T = B^T A^T$.
35. State and prove Pythagoras theorem.
36. A line makes positive intercepts on coordinate axes whose sum is 7 and it passes through $(-3, 8)$. Find its equation.

37. A flag pole of height 'h' metres is on the top of the hemispherical dome of radius 'r' metres. A man is standing 7m away from the dome. Seeing the top of the pole at an angle 45° and moving 5 m away from the dome and seeing the bottom of the pole at an angle 30° .
Find (i) the height of the pole (ii) radius of the dome. ($\sqrt{3} = 1.732$).
38. The internal and external diameters of a hollow hemispherical vessel are 20 cm and 28 cm respectively. Find the cost to paint the vessel all over at ₹ 0.14 per cm^2 ?
39. A right circular cylindrical container of base radius 6cm and height 15 cm is full of ice cream. The ice cream is to be filled in cones of height 9cm and base radius 3 cm, having hemispherical cap. Find the number of cones needed to empty the container.
40. The rainfall recorded in various places of five districts in a week are given below. Find its standard deviation.

Rainfall (in mm)	45	50	55	60	65	70
Number of places	5	13	4	9	5	4

41. Two unbiased dice are rolled once. Find the probability of getting (i) a doublet (equal numbers on both dice) (ii) the product as a prime number (iii) the sum as a prime number (iv) the sum as 1.
42. If $\tan\theta + \sin\theta = m$, $\tan\theta - \sin\theta = n$ and $m \neq n$, then show that $m^2 - n^2 = 4\sqrt{mn}$.

IV ANSWER ALL THE QUESTIONS:

2 X 8 = 16

43. (a) Construct a $\triangle ABC$ such that $AB = 5.5$ cm, $\angle C = 25^\circ$ and the altitude from C to AB is of length 4 cm. (OR) (b) Draw a tangent to the circle from the point P having radius 3.6 cm, and centre at O. Point P is at a distance 7.2 cm from the centre.
44. (a) Draw the graph of $y = 2x^2 - 3x - 5$ and hence solve $2x^2 - 4x - 6 = 0$. (OR) (b) A bus is travelling at a uniform speed of 50 km/hr. Draw the distance - time graph and hence find. (i) the constant of variation (ii) how far will it travel in 90 minutes? (iii) the time required to cover a distance of 300km from the graph.