RM-1

FIRST REVISION TEST - 2025

10 - Sc. MATHEMATICS

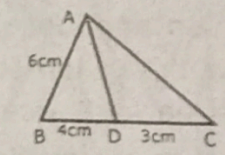
Time : 3.00 Hr. Marks : 100

I Answer all the question. 14X1=14

1. If there are 1024 relations from a set A = {1,2,3,4,5} to set B, then the number of elements in B is a) 3 b) 2 c) 4 d) 8
2. If f : A → B is a bijective function and if n(B) = 7, then n(A) is equal to
   a) 7 b) 49 c) 1 d) 14
3. If f(x) = x² - x, then, f(x-1) - f(x+1) = a) 4x b) 2 - 2x c) 2-4x d) 4x - 2
4. Using Euclid's division lemma, if the cube of any positive integer is divided by 9, then the passible remainders are a) 0,1,8 b) 1,4,8 c) 0,1,3 d) 3,4,8
5. If t_n is the n^{th} term of an A.P then $t_{2n} - t_n$ is
   a) (8n-1)d b) (8n-2)d c) (7n-2)d d) (7nd)
6. A system of three linear equations in the three variables is inconsistent if their planes
   a) intersect only at a point b) intersect in a line
   c) coincide with each other d) do not intersect
7. The GCD of a^m, a^{m+1}, a^{m+2} is a) a^m b) a^{m+1} c) a^{m+2} d) 1
8. If in ΔABC, DE || BC, AB = 3.6cm, AC = 2.4cm and AD = 2.1cm then the length of AE is
   a) 1.4cm b) 1.8cm c) 1.2cm d) 1.05cm
9. The area of a triangle formed by 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
10. The slope of the line which is perpendicular to a line joining the points (0,0) and (-8,8) is
    a) -1 b) 1 c) $\frac{1}{3}$ d) -8
11. If $\sin\theta = \cos\theta$, then the value of $2\tan^2\theta + \sin^2\theta - 1$ is a) $\frac{3}{2}$ b) $\frac{-3}{2}$ c) $\frac{2}{3}$ d) $\frac{-2}{3}$
12. The height of a right circular cone whose radius is 5cm and slant height is 13cm will be
    a) 12cm b) 10cm c) 13cm d) 5cm
13. If the standard deviation of x,y,z is p then the variance of 3x+5, 3y+5, 3z+5 is
    a) 3p + 5 b) $p^2 + 5$ c) $9p^2$ d) 9p+5
14. A page is selected at random from a book. The probability that the digit at units place of the page number chosen is less than 7 is a) $\frac{3}{10}$ b) $\frac{7}{10}$ c) $\frac{3}{9}$ d) $\frac{7}{9}$

II Answer any 10 questions. Q.No. 28 is compulsory. 10 X 2 = 20

15. If B X A = {(-2,3), (-2,4), (0,3), (0,4), (3,3), (3,4)} find A and B.
16. If f(x) = 3x - 2, g(x) = 2x + k and if fog = gof, then find the value of k.
17. If $p^2 \times q^4 \times r \times s^3 = 315000$ the find p,q,r and s.
18. Which term of an A.P. 16, 11, 6, 1, ... is _____ -54?
19. Find the excluded value of $\frac{7p+2}{8p^2+13p+5}$.
20. Determine the nature of the roots of the quadratic equation $15x^2 + 11x + 2 = 0$.
21. In the figure, AD is the bisector of $\angle A$. If BD = 4cm, DC = 3cm and AB = 6cm find AC.



22. Find the slope of a line joining the points $(5, \sqrt{5})$ with the origin.
23. Find the intercepts made by the line $3x - 2y - 6 = 0$ on the co-ordinate ax
24. From the top of a rock $50\sqrt{3}$ m high, the angle of depression of a car on the ground is observed to be 30°. Find the distance of the car from the rock.
25. Find the volume of a cylinder whose height is 2m and whose base ar is 250 sq.m.
26. Find the standard deviation of first 21 natural numbers.
27. What is the probability that a leap year selected at random will conta 53 Saturdays?
28. If $A=\begin{pmatrix} 7 & 5 & -3 \\ 2 & 0 & 5 \\ -4 & 3 & -1 \end{pmatrix}$, $B=\begin{pmatrix} 2 & 4 & 11 \\ -1 & 3 & 2 \\ 0 & 5 & 7 \end{pmatrix}$ then find the value of $2A+3B$.

III Answer any 10 questions. Q.No. 42 is compulsory. 10 X 5 = 50

29. Let A = the set of all natural numbers less than 8, B = the set of all prime numbers less than 8, C = the set of even prime number. Verify that A X (B-C) = (A X B) - (A ∩ C).
30. Let A = {1,2,3,4} and B = {2,5,8,11,14} be two sets. Let $f: A \to B$ be a function given by f(x) = 3x - 1. Represent this function. i) by arrow diagram ii) in a table iii) as a set of ordered pairs iv) in a graphical form.
31. Find the sum to n terms of the series 3 + 33 + 333 + ...
32. Find the sum of $10^3 + 11^3 + 12^3 + \ldots\ldots + 20^3$.
33. If α, β are the roots of $7x^2 + ax + 2 = 0$ and if $\beta - \alpha = -13/7$. Find the value of a.
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. Find the are of the quadrilateral formed by the points (-9, 0), (-8, 6), (-1, -2) and (-6, -3).
37. Find the equation of the median of ΔABC though a whose vertices are $A(6,2)$, $B(-5,-1)$ and $C(1,9)$.
38. A pole 5m high is fixed on the top of a tower. The angle of elevation of the top of the pole observed from a point "A" on the ground is 60° and the angle of depression to the point "A" from the top of the tower is 45°. Find the height of the tower. ($\sqrt{3}$ =1.732)
39. Nathan, an engineering student was asked to make a model shaped like a cylinder with two cones attached at its two ends. The diameter of the model is 3cm and its length is 12cm. If each cone has a height of 2cm, find the volume of the model that Nathan made.
40. The scores of a cricketer in 7 matches are 70,80,60,50,40,90,95. Find the standard deviation.
41. Two dice are rolled once. Find the probability of getting an even number on the first die or a total of face sum 8.
42. Find the square root of $64x^4 - 16x^3 + 17x^2 - 2x + 1$.

IV Answer all the questions. 2 X 8 = 16

43. a) Draw a triangle ABC of base BC = 8cm, $\angle A = 60^\circ$ and the bisector of $\angle A$ meets BC and D such that BD = 6cm. ***(OR)***
    b) Construct a triangle similar to a given triangle PQR with its sides equal to $3/5$ of the corresponding sides of the triangle PQR. (Scale factor $3/5 < 1$).
44. a) Draw the graph of $y = 2x^2 - 3x - 5$ and hence solve $2x^2 - 4x - 6 = 0$. ***(OR)***
    b) A garment shop announces a flat 50% discount on every purchase of items for their customers. Draw the graph for the relation between the marked price and the discount. Hence find i) the marked price when a customer gets a discount of Rs. 3250 (from graph) ii) the discount when the marked price is Rs. 2500.