10 R Register No. [ ]

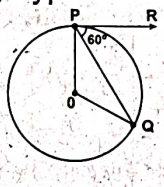
FIRST REVISION TEST - 2025

Time : 3.00 Hours **MATHEMATICS** **Marks : 100**

PART - I

I. Choose the most appropriate answer from the given alternatives and Write the option code and corresponding Answer **14x1=14**

1. If there are 1024 relations from a set A = {1, 2, 3, 4, 5} to a set B, then the number of elements in B is
   a) 3 b) 2 c) 4 d) 8
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. Given $F_1=1$, $F_2=3$ and $F_n = F_{n-1} + F_{n-2}$ then F_5, is
   a) 3 b) 5 c) 8 d) 11
4. If 6 times of 6th term of an A.P. is equal to 7 times the 7^{th} term, then the 13^{th} term of the A.P. is
   a) 0 b) 6 c) 7 d) 13
5. Which of the following should be added to make x^4+64 a perfect square
   a) $4x^2$ b) $16x^2$ c) $8x^2$ d) $-8x^2$
6. A graph of quadratic equation is .....
   a) Straight line b) circle c) parabola d) hyperbola
7. In figure if PR is tangent to the circle at P and O is the centre of the circle, then ∠POQ is
   a) 120° b) 100° c) 110° d) 90°

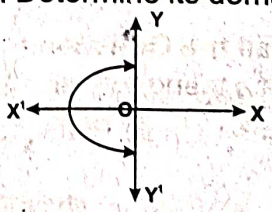


8. The point of intersection of 32x-y=4 and x+y=S is
   a) (5.3) b) (2.4) c) (3:5) d) (4.4)
9. The equation of a line passing through the origin and perpendicular to the line 7x-3y+4=0 is
   a) 7x-3y+4=0 b) 3x-7y+4=0 c) 3x+7y=0 d) 7x-3y=0
10. $\tan\theta \operatorname{cosec}^2\theta - \tan\theta$ is equal to
    a) $\sec\theta$ b) $\cot^2\theta$ c) $\sin\theta$ d) $\cot\theta$
11. The 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
12. A spherical ball of radius r_1 units is melted to make 8 new identical balls each of radius r_2 units. Then is $r_1 r_2$ is
    a) 2:1 b) 1:2 c) 4:1 d) 1:4
13. Which of the following is incorrect?
    a) P(A)>1 b) $0 \le P(A) \le 1$ c) $P(\phi)=0$ d) $P(A) + P(\bar{A}) = 1$
14. If the standard deviation of a data is 3.5 and if each value of the data is decreased by 2 then find the new standard deviation
    a) 5.5 b) 3.5 c)1.5 d) 0

PART - II

II. Answer any ten questions, question no 28 is compulsory **10x2=20**

15. A Relation R is given by the set {(x, y) / y=x+3x ∈ {0,1,2,3,4,5)}. Determine its domain and range.
16. Determine whether the graph given below represent functions. Give reason for your answers concerning each graph.



17. Find the number of terms in the A.P. 3, 6, 9, 12,...., 111.
18. Find the LCM of the following x^3-27, $(x-3)^2$, x^2-9
19. Determine the nature of the roots for the following quadratic equation $15x^2+11x+2=0$
20. The length of the tangent to a circle from a point P, which is 25 cm away from the centre is 24 cm. What is the radius of the circle?

21. Find the slope of a line joining the points $(5,\sqrt{5})$ with the origin
22. Find the equation of a straight line passing through (5, -3) and (7, -4).
23. Prove the following identities. $\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} = \sec\theta + \tan\theta$
24. If the base area of a hemispherical solid is 1386 sq. metres, then find its total surface area?
25. If the ratio of radii of two spheres is 4:7, find the ratio of their volumes.
26. If the standard deviation of a data is 3.6 and each value of the data is divided by 3. then find the new variance and new standard deviation.
27. If $P(A) = \frac{2}{3}$, $P(B) = \frac{2}{5}$, $P(A \cup B) = \frac{1}{3}$ then find $P(A \cap B)$.
28. If $A = \begin{pmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{pmatrix}$ prove that $AA^T = I$

PART - III

III. Answer any ten questions, question no 42 is compulsory **10x5=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) = (AxB) - (AxC)
30. Consider the functions f(x), g(x), h(x) as given below. Show that (fog)oh=fo(goh) $f(x)=x^2$, g(x)=3x and h(x)=x-2
31. Find the sum of the following series $6^2+7^2+8^2+\ldots\ldots\ldots+21^2$
32. A bus covers a distance of 90 km at a uniform speed. Had the speed been 15 km/hour more it would have taken 30 minutes less for the journey. Find the original speed of the bus.
33. If $A=\begin{bmatrix} 1 & 2 & 1 \\ 2 & -1 & 1 \end{bmatrix}$ $B=\begin{bmatrix} 2 & -1 \\ -1 & 4 \\ 0 & 2 \end{bmatrix}$ show that $(AB)^T = B^TA^T$
34. State and prove PYTHAGORAS THEOREM
35. If vertices of a quadrilateral are at A (-5,7), B (-4,k), C (-1-6) and D(4,5) and its area is 72 sq.units. Find the value of k
36. Find the equation of a straight line through the intersection of lines 7x+3y=10, 5x-4y=1 and parallel to the line 13x+5y+12=0
37. An aeroplane at an altitude of 1800 m finds that two boats are sailing towards it in the same direction. The angles of depression of the boats as observed from the aeroplane are 60° and 30° respectively. Find the distance between the two boats. ($\sqrt{3}$=1.732)
38. A toy is in the shape of a cylinder surmounted by a hemisphere. The height of the toy is 25 cm. Find the total surface area of the toy if its common diameter is 12 cm.
39. An aluminium sphere of radius 12 cm is melted to make a cylinder of radius 8 cm. Find the height of the cylinder.
40. Find the variance and standard deviation of the wages of 9 workers given below: ₹310, ₹290, ₹320, ₹280, ₹300, ₹290, ₹320, ₹310, ₹280.
41. Three unbiased coins are tossed once. Find the probability of getting atmost 2 tails or atleast 2 heads.
42. Find the values of a and b if the following polynomials are perfect squares $ax^4+bx^3+361x^2+220x+100$

PART- IV

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

43. Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{3}$ of the corresponding sides of the triangle PQR (scale factor $\frac{7}{3} > 1$)

(OR)

Construct a ΔPQR in which QR = 5 cm. ∠P=40° and the median PG from P to QR is 4.4 cm. Find the length of the altitude from Pto QR.

44. Graph the following linear function $y = \frac{1}{2}x$ Identify the constant of variation and verify it with the graph. Also (i) find y when x = 9 (ii) find x when y= 7.5. (OR)
Draw the graph of $y=x^2+3x-4$ and hence use it to solve $x^2+3x-4=0$