

FRM

FIRST REVISION TEST - 2024

10 - STD

MATHS

Time : 3.00 Hrs

Marks : 100

I Part - I Choose the correct answer from the four alternatives and write the option code and the corresponding answer.

14 X 1 = 14

1. $A = \{a, b, p\}$ $B = \{2, 3\}$ $C = \{p, q, r, s\}$ then $n[(A \cup C) \times B]$ is a) 8 b) 20 c) 12 d) 16
2. If $F: A \rightarrow B$ is a bijective function and if $n(B) = 7$ then $n(A)$ is equal to
a) 49 b) 7 c) 1 d) 14
3. $7^{4k} \equiv \dots \pmod{100}$ a) 1 b) 2 c) 3 d) 4
4. If 6 times of 6th term of an A.P is equal to 7 times then 7th term then the 13th term of the A.P. is
a) 0 b) 6 c) 7 d) 13
5. If $(x-6)$ is H.C.F. of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of k is
a) 3 b) 5 c) 6 d) 8
6. The solution of $(2x-1)^2 = 9$ is equal to
a) -1 b) 2 c) (-1, 2) d) none of these
7. If number of column and rows are not equal in a matrix then it is said to be a
a) diagonal matrix b) rectangular matrix c) square matrix d) Identity matrix
8. If is ΔABC , $DE \parallel BC$ $AB = 3.6$ 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
9. The lengths of the two tangents drawn from point to a circle are equal.
a) an interior b) an exterior c) on d) none of these
10. 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) 15 sq. units
11. The slope of the line joining (12, 3) (4, a) is $\frac{1}{8}$. The value of 'a' is
a) 4 b) -5 c) 2 d) 1
12. $\sec \theta = \operatorname{cosec} \theta$ if θ is
a) 30° b) 60° c) 45° d) 90°
13. The height of a right circular cone whose radius is 5cm and slant height is 13cm will be
a) 25 cm b) 10 cm c) 12 cm d) 5 cm
14. 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) $9p + 5$

II Part - II Answer any 10 questions. Q.No. 28 is compulsory. 10 X 2 = 2015. $A = \{1, 2, 3\}$, $B = \{x/x \text{ is a prime number less than } 8\}$ find $A \times B$ and $B \times A$.16. Find the number of terms in the A.P. $3, 6, 9, 12, \dots, 111$.17. Compute x , such that $10^4 \equiv x \pmod{10}$.18. Find the L.C.M of the expressions $p^2 - 3p + 2, p^2 - 4$.19. Determine the nature of roots for the quadratic equation $x^2 - x - 1 = 0$.20. Construct a 3×3 matrix whose elements are given by $a_{ij} = |i-2j|$.

21. Find the length of the tangent drawn from a point whose distance from the centre of a circle is 5cm and radius of the circle is 3cm.

22. Show that the points P(-1.5, 3) Q(6, -2) R(-3, 4) are collinear.

23. From the top of a rock $50\sqrt{3}$ m high, the angle of elevation of the top of a building is observed to be 30° . Find the distance of the car from the rock.
24. Find the volume of the iron used to make a hollow cylinder of height 9cm and whose external and internal radii are 28cm and 21cm respectively.
25. Find the diameter of a sphere whose surface area is 154m^2 .
26. If the range and smallest value of a set of data are 36.8 and 13.4 respectively. Find the largest value.
27. What is the probability that a leap year selected at random will contain 53 Saturdays?
28. Find the slope of the line which is perpendicular to $2x - 3y + 8 = 0$.

III Part - III Answer any 10 questions. Question No. 42 is compulsory. $10 \times 5 = 50$

29. If the function f is defined by $f(x) = \begin{cases} x+2 & x > 1 \\ 2 & -1 \leq x \leq 1 \\ x-1 & -3 < x < -1 \end{cases}$ find the values of i) $f(3)$ ii) $f(0)$ iii) $f(-1.5)$ iv) $f(2) + f(-2)$.
30. $A = \{1, 2, 3\}$ $B = \{2, 3, 5\}$ $C = \{3, 4\}$ and $D = \{1, 3, 5\}$ check if $(A \cap C) \times (B \cap D) = (A \times B) \cap (C \times D)$ is true.
31. Find the sum of n terms of the series $5 + 55 + 555 + \dots$.
32. Find the H.C.F. of 396, 504, 636.
33. Solve the system of linear equations in three variables $3x - 2y + z = 2$, $2x + 3y - z = 5$, $x + y + z = 6$.
34. Find the square root of $37x^2 - 28x^3 + 4x^4 + 12x + 9$.
35. State and prove Pythagoras theorem.
36. Find the area of the quadrilateral whose vertices are at (-9,0) (-8,6) (-1,-2) and (-6, -3).
37. A line makes positive intercepts on coordinate axes whose sum is 7 and it passes through (-3, 8). Find its equation.
38. From the top of 12m 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.
39. If the radii of the circular ends of a frustum which is 45m high are 28cm and 7cm. Find the volume of the frustum.
40. If $A = \begin{pmatrix} 3 & 1 \\ -1 & 2 \end{pmatrix}$ show that $A^2 - 5A + 7I_2 = 0$.
41. In an apartment, is selecting a house from door numbers 1 to 100 randomly. Find the probability of getting the door number of the house to be an even number or a perfect square number or a perfect cube number.
42. A solid right circular cone of diameter 14cm and height 8 cm is melted to form a hollow sphere. If the external diameter of the sphere is 10cm, find the internal diameter.

IV Part - IV Answer all the questions.

43. Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{3}{5}$ of the corresponding sides of the triangle PQR (scale factor $\frac{3}{5} < 1$) (OR)
Construct a triangle ABC such that $AB = 5.5$ cm $\angle C = 25^\circ$ and the altitude from C to AB is 4cm.
44. A bus is travelling at a uniform speed of 50km/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. (OR)
Draw the graph of $y = 2x^2 - 3x - 5$ and hence solve $2x^2 - 4x - 6 = 0$.