

10 Std

MATHEMATICS

Time: 3.00 Hrs

Reg No.

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Marks : 100

PART - I

Answer All the questions.

14 X 1 = 14

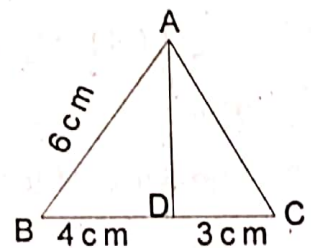
1. If there are 1024 relations from a set $A = \{1, 2, 3, 4, 5\}$ to a set B. Then the number of elements in B
a) 3 b) 2 c) 4 d) 8
2. If $f : A \rightarrow B$ is a bijective function and if $n(B) = 7$ then $n(A)$ is equal to
a) 7 b) 49 c) 1 d) 14
3. If HCF of 65 and 117 is expressible in the form of $65m - 117$, then the value of m is
a) 4 b) 2 c) 1 d) 3
4. The value of $(1^3 + 2^3 + 3^3 + \dots + 15^3) - (1 + 2 + 3 + \dots + 15)$
a) 14400 b) 14200 c) 14280 d) 14520
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. If number of columns 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
7. In $\triangle LMN$, $\angle L = 60^\circ$, $\angle M = 50^\circ$, If $\triangle LMN \sim \triangle PQR$ then the value of $\angle R$ is
a) 40° b) 70° c) 30° d) 110°
8. The area of triangle formed by points $(-4, 0)$, $(0, -4)$ and $(4, 0)$ is
a) 0 sq.units b) 16 sq.units c) 4 sq units d) None of those
9. If slope of the line PQ is $\frac{1}{\sqrt{3}}$ then slope of the perpendicular bisector of PQ is
a) $\sqrt{3}$ b) $-\sqrt{3}$ c) $\frac{1}{\sqrt{3}}$ d) 0

10. If $\sin \theta = \cos \theta$, then $2 \tan^2 \theta + \sin^2 \theta - 1$ is equal to
 a) $\frac{-3}{2}$ b) $\frac{3}{2}$ c) $\frac{2}{3}$ d) $\frac{-2}{3}$
11. The curved surface area of a height circular cone of height 15 cm and base diameter 16 cm is
 a) $60 \pi \text{ cm}^2$ b) $68 \pi \text{ cm}^2$ c) $120 \pi \text{ cm}^2$ d) $136 \pi \text{ cm}^2$
12. A Spherical ball of radius r_1 units is melted to make 8 new identical balls each of radius r_2 units Then $r_1 : r_2$ is
 a) 2 : 1 b) 1 : 2 c) 4 : 1 d) 1 : 4
13. Variance of first 20 natural number is
 a) 32.25 b) 44.25 c) 33.25 d) 30
14. which of the following is incorrect?
 a) $P(A) > 1$ b) $0 \leq P(A) \leq 1$ c) $P(\phi) = 0$ d) $P(A) + P(\bar{A}) = 1$

PART - II

Answer any 10 Questions. Question No.28 is compulsory. 10 X 2 = 20

15. Let $A = \{ 1, 2, 3 \}$ and $\{ B = x/x \text{ is a prime number less than } 10 \}$. Find $A \times B$ and $B \times A$
16. If $A = \{ -2, -1, 0, 1, 2 \}$ and $f: A \rightarrow B$ is an onto function defined by $f(x) = x^2 + x + 1$ then find B.
17. Solve $3x - 2 = 0 \pmod{11}$.
18. Find the LCM of $(5x - 10)$, $(5x^2 - 20)$.
19. Find the quadratic equation whose sum and product of roots are -9, 20
20. If $A = \begin{bmatrix} 5 & 4 & 3 \\ 1 & -7 & 9 \\ 3 & 8 & 2 \end{bmatrix}$ then find the transpose of A
21. In the Figure AD is the bisector of $\angle A$ If $BD = 4 \text{ cm}$, $DC = 3 \text{ cm}$ $AB = 6 \text{ cm}$, Find AC
22. If the three point $(3, -1)$ $(a, 3)$ and $(1, -3)$ are collinear. Find the value of a
23. Find the equation of a line passing through the point $(3, -4)$, and having slope $\frac{-5}{7}$



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 diameter of a sphere whose surface area is 154 m^2 .
26. If the largest and the smallest value of a set of data are 36.8 and 13.4 respectively, then find the largest value.
27. Two dice are rolled together Find the probability of getting a doublet?

PART - III

Answer any 10 Questions. Question No.42 is compulsory. 10 X 5 = 50

29. Let $A = \{ x \in W / x < 2 \}$, $B = \{ x \in N / 1 < x \leq 4 \}$ and $C = \{ 3, 5 \}$ verify $A \times (B \cap C) = (A \times B) \cap (A \times C)$
30. If $f(x) = x^2$, $g(x) = 2x$ and $h(x) = x + 4$ show that $(f \circ g) \circ h = (f \circ h) \circ g$
31. In a G.P the 9th term is 32805 and 6th term is 1215. Find the 12th term
32. Rekha has 15 square colour papers of size 10 cm, 11 cm, 12 cm, 24 cm. How much area can be decorated with these colour papers?
33. If $36x^4 - 60x^3 + 61x^2 - mx + n$ is a perfect square Find the values of m and n
34. If $A = \begin{pmatrix} 1 & 1 \\ -1 & 3 \end{pmatrix}$, $B = \begin{pmatrix} 1 & 2 \\ -4 & 2 \end{pmatrix}$, $C = \begin{pmatrix} -7 & 6 \\ 3 & 2 \end{pmatrix}$ verify that $A(B+C) = AB+AC$.
35. State and prove angle bisector theorem.
36. A triangular slanted glass of with vertices at $A = (-5, -4)$, $B = (1, 6)$ and $C = (7, -4)$ has to be painted. If one bucket of paint covers 6 square feet, how many buckets of paint will be required to paint the whole glass if only one coat of paint is applied.
37. $A(-3, 0)$, $B(10, -2)$ and $C(12, 3)$ are the vertices of a triangle ABC. Find the equation of the altitude through A.
38. If $\sin \theta (1 + \sin^2 \theta) = \cos^2 \theta$ then prove that $\cos^6 \theta - 4\cos^4 \theta + 8\cos^2 \theta = 4$
39. The radius and height of cylinder are in the ratio 5 : 7 and its curved surface area is 5500 sq cm Find its radius and height

40. A solid sphere of radius 6 cm is melted into a hollow cylinder of uniform thickness. If the external radius of the base of the cylinder is 5 cm and its height is 32 cm, then find the thickness of the cylinder
41. The marks scored by 10 students in a class test are 25, 29, 30, 33, 35, 37, 38, 40, 44, 48 Find the standard deviation.
42. There unbiased coins are tossed once. Find the probability of getting at most 2 tails or atleast 2 heads.

PART - IV

Answer the following.

2 X 8 = 16

- 43.a) Construct a ΔPQR such that $QR = 5\text{cm}$, $\angle P = 30^\circ$ and the altitude from P to QR of length 4.2 cm

(OR)

- b) Draw a circle of diameter 6 cm from a point P, which is 8 cm away from its centre. Draw the tangents PA and PB to the circle and measure their lengths.

44. a) Draw the graph of $y = x^2 - 4$ and hence solve $x^2 - x - 12 = 0$

(OR)

- b) Graph the following linear function $y = \frac{1}{2}x$ Identify the constant of variation and verify it with the graph. Also find y when $x=9$
ii) find x when $y = 7.5$

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MATHEMATICS

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