CODE : A-M616112-A

I Semester Exam 2025-26

3 x 545

Std. : XI | Sub. : MATHEMATICS AND STATISTICS | Marks : 50

Date : | Roll No. _____ | Time : 2.30 hrs.

Instructions :

Question paper is divided into 4 sections.

1) ***Section A*** - *Q. No 1 contain 5 MCQ carrying 2 marks each.*
   Q. No. 2 contain 4 VSA (Very short answer) carrying 1 mark each.
2) ***Section B*** - *Q. No. 3 to Q. No. 13 contain 11 short answer type question carrying 2 marks each.*
3) ***Section C*** - *Q. No. 14 to Q. No. 19 contain 6 short answer type question carrying 3 marks each.*
4) ***Section D*** - *Q. No. 20 to Q. No. 23 contain 4 long answer type question carrying 4 marks each.*

- *Figures to the right indicate full marks.*
- *Start each section with new page.*

Section - A

Q. 1 ***Select and write the most appropriate answer from the given alternatives for each sub-questions.*** **10**

i) *If G.M and H.M are 4 and* $\frac{16}{5}$ *respectively then A.M =* _____

a) 4 b) 5 c) 16 d) 20

ii) *If* $\begin{vmatrix} x-1 & x & x-2 \\ 0 & x-2 & x-3 \\ 0 & 0 & x-3 \end{vmatrix} = 0$ *then x =* _____

a) (1 , 2 , 3) b) (0 , 1 , 2) c) (– 1 , – 2 , – 3) d) (0 , 2 , 3)

iii) *If* $\frac{4}{3}$, x , $\frac{4}{27}$ *are in G.P then x =* _____

a) $\frac{3}{27}$ b) $\frac{4}{9}$ c) $\frac{4}{3}$ d) $\frac{27}{3}$

iv) *If* $\left(x + \frac{1}{3} , \frac{y}{3} - 1\right) = \left(\frac{1}{2} , \frac{3}{2}\right)$, *then x , y =* _____

a) $\left(\frac{1}{6} , \frac{15}{2}\right)$ b) $\left(\frac{1}{6} , \frac{5}{2}\right)$ c) $\left(\frac{1}{3} , \frac{15}{2}\right)$ d) $\left(\frac{1}{3} , \frac{5}{2}\right)$

v) *The interval (6 , ∞) in Set Builder from is* _____

a) $\{x / x \in R , x \leq 6\}$
b) $\{x / x \in R , x \geq 6\}$
c) $\{x / x \in R , x < 6\}$
d) $\{x / x \in R , x > 6\}$

Q. 2 ***Answer the following questions.*** **4**

i) *Describe the given set in Roster form.*
$C = \{ x / x = 2n + 1 , \ n \in N \}$

ii) *If* $P = \{1 , 2 , 3\}$ *and* $Q = \{1 , 4\}$ *find* $P \times Q$.

iii) *Verify whether the given sequence is in H.P .*
$\frac{1}{3} , \frac{1}{5} , \frac{1}{7} , \frac{1}{9} , ...$

iv) *Find the value of determinant* $\begin{vmatrix} 2 & -4 \\ 7 & -15 \end{vmatrix}$

Section - B

Attempt any Eight of the following questions. **16**

Q. 3 *Write the interval [6 , 12] in Set-Builder form.*

Q. 4 *If* $\begin{vmatrix} x & -1 & 2 \\ 2x & 1 & -3 \\ 3 & -4 & 5 \end{vmatrix} = 29$ *then find value of x.*

Q. 5 *If* $A = \{ a , b, c \} , B = \{ x , y \}$ *find* $A \times B , B \times B$.

Q. 6 *Write the relation in the Roster form*
$R = \{ (a, a^2) / a$ *is a prime number less than 15* $\}$

Q. 7 *If the common ratio of a G.P is* $\frac{2}{3}$ *and sum to infinity is 12. Find the first term.*

Q. 8 *If* $a = \frac{1}{243} , r = 3$ *find* t_6.

Q. 9 *If* $S_5 = 1023, r = 4$ *find a.*

Q. 10 *Find the area of triangle whose vertices are A (5 , 8) , B (5 , 0) , C (1 , 0)*

Q. 11 *Examine the collinearity of the given set of points.*
$A (3 , -1) , B (0 , -3) , C (12 , 5)$

Q. 12 *Examine the consistency of the given equations.*
$2x - y + 3 = 0 , \ 3x + y - 2 = 0 , \ 11x + 2y - 3 = 0$

Q. 13 *Describe the given set in Set-Builder form.*
$A = \{ 0 , \pm 1 , \pm 2 , \pm 3 \}$

Section - C

Attempt any Four of the following questions. **12**

Q. 14 *If* $A = \{1, 2, 3, 4\}$, $B = \{3, 4, 5, 6\}$, $C = \{4, 5, 6, 7, 8\}$ *then verify* $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

Q. 15 *Without expanding evaluate the determinant* $\begin{vmatrix} 2 & 3 & 4 \\ 5 & 6 & 8 \\ 6x & 9x & 12x \end{vmatrix}$

Q. 16 *Solve the given inequalities and write the solution set using interval notation*
$-9 < 2x + 7 \leq 19$

Q. 17 *Find the sum to n terms of the sequence 0.5 , 0.05 , 0.005 , ...*

Q. 18 *Solve the following linear equations by using Cramer's Rule.*
$x + y + z = 6$, $x - y + z = 2$, $x + 2y - z = 2$

Q. 19 *Express the recurring decimal* $0.\overline{7}$ *as a rational number.*

Section - D

Attempt any Two of the following questions. **8**

Q. 20 *Find* $(70^2 - 69^2) + (68^2 - 67^2) + (66^2 - 65^2) + \ldots\ldots\ldots + (2^2 - 1^2)$

Q. 21 *Find minor and cofactor of elements of determinant* $\begin{vmatrix} 2 & -1 & 3 \\ 1 & 2 & -1 \\ 5 & 7 & 2 \end{vmatrix}$

Q. 22 *Find four numbers in G.P such that the sum of middle two numbers is* $\frac{10}{3}$ *and their product is 1.*

Q. 23 *There are 260 persons with a skin disorder. If 150 had been exposed to the chemical A, 74 to the chemical B and 36 to both chemical A and B, find the number of person exposed to*

i) Chemical A or Chemical B

ii) Chemical A but not Chemical B.