CODE : A-M223112-M	**I Semester Exam 2024-25**	2 x 790
Std. : XI	Sub. : Mathematics & Statistics (40)	Marks : 50
Date :	Roll No. 78	Time : 2½ hrs.

Instructions : Question paper is divided into four sections - A , B, C ,D

1. ***Section - A*** *: Q.No.1 contains **5 MCQ's** carrying **2 marks** each.*
   *Q.No.2 contains **4 VSA (very short answer)** carrying **1 mark** each.*
2. ***Section - B*** *: Q.No.3 to Q.No.13 contains **11 short answer** type carrying **2 marks** each.*
3. ***Section - C*** *: Q.No.14 to Q.No.19 contains **6 short answer** type carrying **3 marks** each.*
4. ***Section - D*** *: Q.No.20 to Q.No.23 contains **4 long answer** type questions carrying **4 marks** each.*
5. *Figures to the right indicate full marks.*
6. *Start each section on new page.*

Section - A

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

i) In degree measure, exterior angle of the regular pentagon is _____

A) 72° B) 30° C) 45° D) 108°

ii) The cartesian co-ordinates of the point whose polar co-ordinates are (3 , 90°) is _____.

A) (0 , 2) B) (0 , 3) C) (0 , 1) D) (3 , 0)

iii) The value of sin(690°) is _____.

A) $\frac{1}{2}$ B) $\frac{\sqrt{3}}{2}$ C) $-\frac{1}{2}$ D) $-\frac{\sqrt{3}}{2}$

iv) If a = 2, r = 3, Sn = 242 then n = _____.

A) 4 B) 6 C) 7 D) 5

v) Set-Builder form of {0 , –1 , 2 , – 3 , 4 , – 5 , 6 , ...} is _____.

A) $\{x / x = (-1)^{n-1}(n-1), n \in N\}$ B) $\{x / x = (2n-1), n \in N\}$
C) $\{x / x = -(2n-1), n \in N\}$ D) $\{x / x = (-1)^n . n, n \in N\}$

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

i) Convert 85° in radian.

ii) Find the value of sin(15°).

iii) Write t_n of the G.P. 2, 6 , 18 , 54 , ...

iv) Describe $B = \{x / x \text{ is an integer }, -\frac{3}{2} < x < \frac{9}{2}\}$ in Roster form.

Section - B

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

Q. 3 *Determine whether the following pair of angles are co-terminal 210°, – 150°.*

Q. 4 *State the signs of i) tan (380°) ii) cot (230°).*

Q. 5 *Find the value of $\sin \frac{19\pi^c}{3}$.*

P.T.O

Q. 6 Evaluate $\sin 30° + \cos 45° + \tan 180°$.

Q. 7 Evaluate $4\cot 45° - \sec^2 60° + \sin 30°$.

Q. 8 Find A.M of two positive numbers whose G.M. and H.M. are 4 and $\frac{16}{5}$ respectively.

Q. 9 If the common ratio of a G.P. is $\frac{2}{3}$ and sum to infinity is 12. Find the first term.

Q. 10 Describe the following set in Set-Builder form.

$$\left\{\frac{1}{2}, \frac{2}{5}, \frac{3}{10}, \frac{4}{17}, \frac{5}{26}, \frac{6}{37}, \frac{7}{50}\right\}$$

Q. 11 Find S_n of the G.P. 3 , 6 , 12 , 24 , ...

Q. 12 If $\left(x + \frac{1}{3}, \frac{y}{3} - 1\right) = \left(\frac{1}{2}, \frac{3}{2}\right)$ find x and y.

Q. 13 For the G.P. if $r = \frac{1}{3}$, $a = 9$ find t_7.

Section - C

Attempt any Four of the following question 12

Q. 14 Prove that $\tan 8\theta - \tan 5\theta - \tan 3\theta = \tan 8\theta \cdot \tan 5\theta \cdot \tan 3\theta$.

Q. 15 Prove that $\frac{\sin 2x + \sin 2y}{\sin 2x - \sin 2y} = \frac{\tan(x+y)}{\tan(x-y)}$.

Q. 16 The perimeter of a sector of the circle of area 25π sq.cm is 20cm. Find the area of sector.

Q. 17 Find the sum to n terms of the sequence.
0.2 , 0.02 , 0.002 , ...

Q. 18 Write the relation in the Roster form. State its domain and range
$R_6 = \{(a, b) / a \in N, a < 6 \text{ and } b = 4\}$

Q. 19 Insert two numbers between 1 and – 27 so that the resulting sequence is a G.P.

Section - D

Attempt any Two of the following questions. 8

Q. 20 Prove that $16.\sin\theta.\cos\theta.\cos 2\theta.\cos 4\theta.\cos 8\theta = \sin 16\theta$.

Q. 21 In ΔABC, $A + B + C = \pi$, show that
$\cos 2A + \cos 2B + \cos 2C = -1 - 4\cos A.\cos B.\cos C$

Q. 22 Find $\sum_{r=1}^{n}\left(\frac{1 + 2 + 3 + 4 + ... + r}{r}\right)$

Q. 23 If A and B are subsets of the universal set X and $n(X) = 50$, $n(A) = 35$, $n(B) = 20$, $n(A' \cap B') = 5$
Find i) $n(A \cup B)$
ii) $n(A' \cap B)$