

Code: A-M223112-A

I Semester Exam – 2024-25

3 x 680

Std.: XI

Sub: Mathematics

Marks: 50

Date:

Roll No.: _____

Time: 2½ hr.

General Instructions:

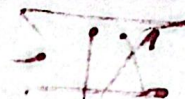
Question paper is divided into four sections.

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 marks each.
2. Section B : Q. No 3 to Q.No.13 contains 11 short answer type carrying 2 mark 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. Figure to the right indicate full marks.
6. Start each section with new page.

SECTION - A

Q.1 A) Select and write the most appropriate answer from the given alternatives for each sub - question. (10)

- i) Which pair of angles is not co-terminal.....
 (a) $210^\circ, -150^\circ$ b) $360^\circ, -30^\circ$
 c) $540^\circ, -180^\circ$ d) $900^\circ, -900^\circ$
- ii) Polar co-ordinates of point $(1, \sqrt{3})$ is
 a) $(2, 60^\circ)$ b) $(2, 30^\circ)$ c) $(1, 30^\circ)$ d) $(1, 60^\circ)$
- iii) $\cos 600^\circ = \dots\dots\dots$
 a) $\frac{1}{2}$ b) $-\frac{1}{2}$ c) $\frac{\sqrt{3}}{2}$ d) $-\frac{\sqrt{3}}{2}$
- iv) If the common ratio a G.P. is $\frac{2}{3}$ and sum to infinity is 12. Then first term =
 a) 4 b) 6 c) 8 d) 18
- v) If $\left(x + \frac{1}{3}, \frac{y}{3} - 1\right) = \left(\frac{1}{2}, \frac{3}{2}\right)$ then x and y values are
 a) $\left(\frac{1}{6}, \frac{15}{2}\right)$ b) $\left(\frac{1}{3}, \frac{3}{2}\right)$
 c) $\left(\frac{1}{2}, \frac{15}{2}\right)$ d) $\left(\frac{1}{6}, \frac{5}{2}\right)$



Q.2) Answer the following.

(4m)

- Convert the angle $\theta = 85^\circ$ into radian.
- Express the given angle as sum or difference of two trigonometric functions :
 $2 \cos 4\theta \cos 2\theta$
- For the given sequence in G.P., find the value of t_n , 2, 6, 18, 24,
- Describe the given set in Roster form
 $C = \{x / x = 2n + 1, n \in N\}$

Section - B

Attempt any eight of the following questions :

(16m)

- Q.3) Find degree and radian measure of exterior and interior angles of regular Pentagon.
- Q.4) Find the Cartesian co-ordinate of point where polar co-ordinate is $(1, 180^\circ)$
- Q.5) Find the value of $\cos 1140^\circ$
- Q.6) Evaluate, $\operatorname{cosec} 45^\circ + \cot 45^\circ + \tan 0^\circ$
- Q.7) If $\cos \theta = \frac{-3}{5}$ and $180^\circ < \theta < 270^\circ$, find the value of $\sin \theta$.
- Q.8) The numbers $x - 6, 2x, x^2$ are in G.P. find the value of x .
- Q.9) Express the recurring decimal $0.\overline{7}$ as a rational number.
- Q.10) Find AM of two positive numbers whose GM and HM are 4 and $16/5$ respectively.
- Q.11) If $r = -3$ and $t_v = 1701$. Find a .
- Q.12) If $A = \{a, b, c\}$ and $B = \{x, y\}$ then find $A \times B$ and $B \times A$.
- Q.13) Describe the given set in set Builder form
 $A = \{0, -1, 2, -3, 4, -5, 6, \dots\}$

Section C

Attempt any four of the following.

(12 m)

- Q.14) Find the sum to n terms
 $3 + 33 + 333 + 3333 + \dots$
- Q.15) Prove the following
 $\sqrt{2 + \sqrt{2 + \sqrt{2 + 2 \cos 8x}}} = 2 \cos x$
- Q.16) Prove the following.
$$\frac{\sin 2x + \sin 2y}{\sin 2x - \sin 2y} = \frac{\tan(x + y)}{\tan(x - y)}$$
- Q.17) Insert two numbers between 1 and -27 so that the resulting sequence is in GP.
- Q.18) In a cyclic quadrilateral two adjacent angles are 40° and $\left(\frac{\pi}{3}\right)^\circ$ find the angles of quadrilateral in degree.

- Q.19) Solve the given inequality and write the solution set using interval notation
 $x^2 - x > 20$

Section D

Attempt any two of the following.

(8m)

- Q.20) There are 260 person with a skin disorder. If 150 had been exposed to chemical A, 74 to chemical B and 36 to both A and B, find the number of person exposed to

i) Chemical A or B

ii) Chemical A but not chemical B.

- Q.21) Prove the following.

$$\frac{1}{\tan 3A - \tan A} - \frac{1}{\cot 3A - \cot A} = \cot 2A$$

- Q.22) In $\triangle ABC$, $A + B + C = \pi$, then show that $\cos 2A + \cos 2B + \cos 2C = -1 - 4 \cos A \cos B \cos C$.

- Q.23) If $\frac{1 \times 2 + 2 \times 3 + 3 \times 4 + 4 \times 5 + \dots \text{upto } n \text{ terms}}{1 + 2 + 3 + \dots \text{upto } n \text{ terms}} = \frac{100}{3}$ find n.
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