CODE : A - M730112 - A	First Semester Examination 2023 - 24	3 x 650
Std. : XI	Sub. : Mathematics & Statistics	Marks : 50
Date : 02/11/2023	Roll no. _____	Time : 2 ½ hrs

General Instructions :-

Question paper consists of 23 questions divided into Four sections, namely A, B, C and D

1. Section - A : Q. No. 1 contains 5 multiple choice type of questions carrying two marks each.
   Q. No. 2 contains 4 very short answer type of questions carrying One mark each.
2. Section - B : Q. No. 3 to Q. No. 13 are 11 short answer type of questions carrying two marks each. Out of which any eight are to be attempted.
3. Section - C : Q. No. 14 to Q. No. 19 contains 6 short answer type questions carrying 3 marks each. Out of which any four are to be atempted.
4. Section - D : Q. No. 20 to Q. No. 23 are 4 long answer type of questions carrying 4 mark each. Out of which any two are to be attempted.
5. Figures to the right indicate full mark.
6. Start each section on new page.
7. For each MCQ, correct answer must be written along with its alphabet.
   e.g (a) ..... / (b) ..... / (c) ..... / (d) .....
8. Evaluation of each MCQ would be done for the first attempt only.

Section - A

Q.1. Select and write the correct answer. **10**

1) If $\left(x+\frac{1}{3}, \frac{y}{3}-1\right)=\left(\frac{1}{2}, \frac{3}{2}\right)$ then value of x and y are _____

a) $\frac{1}{6}, \frac{15}{2}$ b) $-\frac{1}{6}, \frac{15}{2}$ c) $\frac{1}{6}, \frac{-15}{2}$ d) $-\frac{1}{6}, -\frac{15}{2}$

2) If the common ratio of GP is $\frac{2}{3}$ and sum to infinity is 12. Then first term is _____

a) 3 b) 4 c) 2 d) 1

3) Which of the following pair of angle's is co-terminal ?

a) $360^0, -30^0$ b) $860^0, 580^0$ c) $-180^0, 540^0$ d) $200^0, 150^0$

4) Cartesian co-ordinates of points whose polar co-ordinate is $(1, 180^0)$ _____

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

5) The value of Cos 600^o = _____

a) $\frac{-\sqrt{3}}{2}$ b) $\frac{\sqrt{3}}{2}$ c) $\frac{1}{2}$ d) $-\frac{1}{2}$

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

1) Express the following as sum or difference of two trignometric functions.
   2 Sin 4x Cos 2x
2) Describe he following set in Roster form
   $C=\{x/x=2n+1, n\in N\}$

3) Determine the quadrant for $\theta = 250^0$.

4) Find slope of the line whose inclination is $\frac{\pi}{4}$.

Section B

Attempt any Eight **16**

Q.3. If A = {a, b, c} , B = { x , y } find A × B, B × A.

Q.4. The numbers $x - 6$, $2x$ and x^2 are in G.P. find x.

Q.5. If $r = \frac{1}{3}$, a = 9 find t_7.

Q.6. Write the relation in Roster form and state its domain.

$R = \{(x,y) / x + y = 3, x, y \in \{0,1,2,3\}\}$

Q.7. Find AM of two postitive numbers whose GM and HM are 4 and $\frac{16}{5}$ respectively.

Q.8. A (– 5, 2) and B (4, 1). Find the equation of locus of point P, which is equidistance from A and B.

Q.9. Evaluate the following : $Sin30^0 + Cos45^0 + tan180^0$

Q.10. Find the value of $Sin\left(\frac{19\pi^c}{3}\right)$

Q.11. Find the polar co-ordinates of point whose cartesian co-ordinate is $(1, \sqrt{3})$

Q.12. Find the value of sinθ and tanθ if $\cos\theta = -\frac{3}{5}$ and $180^0 < \theta < 270^0$.

Q.13. Find the degree and radian measure of exterior angle of regular Pentagon.

Section C

Attempt any four. **12**

Q.14. The perimeter of a sector of the circle of area 25π sq.cm. is 20 cm. Find the area of sector.

Q.15. Find the distance of the point A (–2,3) from the line $12x - 5y - 13 = 0$

Q.16. Find the sum to n terms of the sequence 0.2, 0.02 , 0.002, ...

Q.17. Insert two numbers between 1 and – 27 so that the resulting sequence is in a G.P.

Q.18. Write the relation in Roster form. State its domain and range.

$R_6 = \{(a, b) / a \in N, a < 6 \text{ and } b = 4\}$

Q.19. Solve the given inequality and write the solution set using interval notation

$x^2 - x > 20$

Section D

Attempt any Two. 8

Q.20. Prove the following.

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

Q.21. Find the equation of line

a) Passing through the point P(2,1) and Q (2. –1)

b) Containing the point A (3,5) and having slope $\frac{2}{3}$.

Q.22. If A and B are subsets of the universal set X and n (X) = 50, n (A) = 35, n (B) = 20, n (A' ∩ B') find.

i) n (A ∪ B)

ii) n (A ∩ B)

iii) n (A' ∩ B)

iv) n (A ∩ B')

Q.23. Find the sum $\sum_{r=1}^{n}\left(\frac{1+2+3+---+r}{r}\right)$