

9

TIME:- 3 HOURS

SUBJECT:- MATHEMATICS

MARKS:- 75

GROUP:- **I**

PASS MARKS:- 25

Note:- Part-I is compulsory and five from Part-III & two from part IV
(11+2 MARKS)

- Q.1.** (i) Solution Set of equation, $x^2 + 10x + 24 = 0$ is $\{4, -4, 3, -3\}$
 (ii) In ratio, $4 : x :: x : 16$ the value of x is $\{-6, -4\}, \{-6, 4\}, \{6, 4\}, \{6, -4\}$
 (iii) The partial fraction form of $\frac{x+2}{(x+3)(x+4)}$ is $\left\{ \frac{A}{x+3} + \frac{B}{x+4} \right\}$
 (iv) A Set having only one element is called $\{ \frac{A+B}{x+3}, \frac{C}{x+4}, \frac{A-B}{x+3x+4}, \frac{B+A}{x+1(x+4)} \}$
 (v) A set having no element is called $\{ \text{Null set, Power set, Singleton Set, Infinite set} \}$
 (vi) Area of Sector's formula = $\left\{ \frac{1}{2}r\theta, \frac{1}{2}r\theta^2, \frac{1}{2}r^2\theta, \frac{1}{2}r^2\theta^2 \right\}$
 (vii) Angle is the union of $\{ \text{non-collinear rays, collinear rays, initial rays, terminal rays} \}$
 (viii) Sum of deviations taken from mean is always $\{ 3, 2, 1, 0 \}$
 (ix) Circle is the $\{ \text{locus, centre, radius, diameter} \}$ of moving point in a plane
 (x) In an Arc of a circle subtended a central angle of 75° , then the corresponding chord of the Arc will make the central angle of $\{ 30^\circ, 45^\circ, 60^\circ, 75^\circ \}$
 (xi) A quadrilateral is called $\{ \text{Non parallel, equal, circular, non circular} \}$ when a circle passes through its four vertices

PART-II (8 x 3 = 24 MARKS)

- Q.2.** Attempt any Eight (8) questions.
 (i) Solve equation, $3 - 4x - 7x^2 = 0$ to find sol set (ii) Prove $\left[\frac{1 + \sqrt{1 - 2^{-2n}}}{2} \right]^2 = \frac{1 + \sqrt{1 - 2^{-2n+2}}}{2}$
 (iii) Find the value of k if sum of the roots of equation $x^2 + 2kx + 8 = 0$ will be equal to k^2 & square of the product of roots
 (iv) Find value of x if, $45^\circ - 90^\circ = 350^\circ - x$ (v) $2x^2 + 3x - 5$ resolve into partial fraction
 (vi) If $U = \{1, 2, 3, \dots, 20\}$, $A = \{1, 2, 5, \dots, 17\}$ and $B = \{4, 6, \dots, 20\}$ then find $A \cap B$ and $(A \cap B)^c$
 (vii) In the given data: 46, 58, 61, 75, 29, 31, 56, 55, 48 Find the mean, Mode and median
 (viii) If radius of circle is 5.5 cm and Area of sector is 30.25 cm² then find the value of θ
 (ix) If $A = \{-2, -7, -2, -4\}$ and $B = \{-5, -6, -7, -8\}$ then find $A \times B$ and $B \times A$
 (x) In which quadrant the point $A(5, -3)$ lies and find the value of $\sin \theta$
 (xi) Define congruent circles and congruent Arcs (xii) Define and draw diagram of second and tangent.

PART-III (5 x 5 = 25 MARKS)

- Q.3.** Attempt any five (5) questions.
 (i) $12 = 4x + 5x^2$ solve by completing square
 (ii) The sum of two numbers is 7 and the sum of their squares is 25. Find the numbers.
 (iii) If y varies directly as the product of x^2 and z and inversely as v^2 and $y = 27$ when, $x = 6, z = 7, v = 4$, find the value of y when $x = 2, v = 6$, and $z = 3$. (iv) $\frac{2x+7}{x^2-4}$ resolve into partial fractions

(v) Calculate geometric mean and harmonic mean of the data

Classes	65-84	85-104	105-124	125-144	145-164	165-184
f	3	8	19	14	9	5

- (vi) If $A = \{x/x \in \mathbb{N} \wedge x \leq 6\}$ and $B = \{y/y \in \mathbb{W} \wedge y \leq 5\}$ then find binary relation A to B , $R = \{(x,y) / x+y = 6\}$
 (vii) If $\sin \theta = \frac{3}{5}$ and θ lies in I quadrant then find the values of $(\tan \theta + \sec \theta)^2$ and $(\sin \theta + \cos \theta)^2$
 (viii) A stud of a flying kite is 200m long, and its angle of elevation is 60° . Find the height of the kite above the hand, taking the stud to be full stretched.

PART-IV (7 x 2 = 14 MARKS) (Attempt any two questions)

- Q.4** the measure of a central angle of a minor arc of a circle is double that of the angle subtended by the corresponding major arc.
Q.5 In any triangle, the sum of squares on any two sides is equal to twice the square on half the sides is equal to twice the square on the median which bisects the third side
Q.6 A line segments, drawn from the centre of a circle which bisects the chord (which is not a diameter) is perpendicular to the chord.
Q.7 Draw two equal circles of radius 2.5cm each. If the distance between their centres is 7cm then draw their transverse tangents.