

**Q-1 Choose the correct option.**

**Time Allowed:** 20 Minutes

**SECTION – A**

**Marks:** 15

- Which of the following algebraic expressions is a polynomial?  
 (a)  $y^2 + 3y + 2$       (b)  $\sqrt{y^2 + 3y + 2}$       (c)  $y^2 + \frac{3}{y} + 2$       (d)  $\sqrt{y^2 + 3y} + 2$
- The value of  $x^3 - x^2 - 2x - 5$  at  $x = -3$  is:  
 (a)  $-47$       (b)  $-35$       (c)  $-17$       (d)  $19$
- $x^3 + 64 =$   
 (a)  $(x - 4)(x^2 + 4x + 16)$       (b)  $(x - 4)(x^2 - 4x + 16)$   
 (c)  $(x + 4)(x^2 + 4x + 16)$       (d)  $(x + 4)(x^2 - 4x + 16)$
- Zero of the polynomial  $p(y) = y^2 - 7y + 12$  is:  
 (a)  $-4$       (b)  $-3$       (c)  $4$       (d)  $7$
- L.C.M of  $(y - 4)^2$  and  $y^2 - 16$  is:  
 (a)  $(y - 4)$       (b)  $(y + 4)$       (c)  $(y + 4)(y - 4)$       (d)  $(y - 4)^2(y + 4)$
- The solution set of  $5y - 3 = -23$  is:  
 (a)  $\left\{-\frac{26}{5}\right\}$       (b)  $\{-4\}$       (c)  $\{4\}$       (d)  $\left\{\frac{26}{5}\right\}$
- $x \leq y$  means:  
 (a)  $x$  is less than or equal to  $y$       (b)  $x$  is greater than or equal to  $y$   
 (c)  $x$  is less than  $y$       (d)  $x$  is greater than  $y$
- The quadratic equation in the following is:  
 (a)  $x^2 - \frac{2}{x} + 5 = 0$       (b)  $x^2 - 2x + \frac{5}{x} = 0$       (c)  $x^2 - 2x + 5 = 0$       (d)  $\sqrt{x^2 - 2x + 5} = 0$
- The scalar matrix in the following is:  
 (a)  $\begin{bmatrix} 3 & 3 \\ 3 & 3 \end{bmatrix}$       (b)  $\begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$       (c)  $\begin{bmatrix} 0 & 3 \\ 3 & 0 \end{bmatrix}$       (d)  $\begin{bmatrix} 3 & 0 \\ 0 & 2 \end{bmatrix}$
- The determinant of matrix  $A = \begin{bmatrix} 4 & -3 \\ 5 & -2 \end{bmatrix}$  is:  
 (a)  $-23$       (b)  $-7$       (c)  $7$       (d)  $23$
- The adjoint of the matrix  $\begin{bmatrix} 1 & -4 \\ 6 & 3 \end{bmatrix}$  is:  
 (a)  $\begin{bmatrix} 3 & -4 \\ 6 & 1 \end{bmatrix}$       (b)  $\begin{bmatrix} 1 & 4 \\ -6 & 3 \end{bmatrix}$       (c)  $\begin{bmatrix} 1 & 6 \\ -4 & 3 \end{bmatrix}$       (d)  $\begin{bmatrix} 3 & 4 \\ -6 & 1 \end{bmatrix}$
- If the sum of measures of two angles is  $90^\circ$ , then these angles are called:  
 (a) adjacent angles      (b) supplementary angles  
 (c) complementary angles      (d) vertically opposite angles
- The length of one of the sides of an equilateral triangle is  $8\text{cm}$ . Its area is:  
 (a)  $2\sqrt{3}\text{ cm}^2$       (b)  $8\sqrt{3}\text{ cm}^2$       (c)  $16\sqrt{3}\text{ cm}^2$       (d)  $64\sqrt{3}\text{ cm}^2$
- The area of a semi-circle having a radius of  $5\text{cm}$  is:  
 (a)  $7.85\text{cm}^2$       (b)  $15.71\text{cm}^2$       (c)  $39.27\text{cm}^2$       (d)  $78.54\text{cm}^2$
- The point which lies in the quadrant II is:  
 (a)  $(2, 5)$       (b)  $(2, -5)$       (c)  $(-2, -5)$       (d)  $(-2, 5)$

SECTION – B

Marks: 36

Q-2 Answer any NINE parts. Each part carries FOUR marks.

- i. Reduce the expression  $\frac{x^2 - 6x + 8}{x^2 - 4}$  to its lowest terms.
- ii. Find the value of  $a^2 + b^2$  when  $(a + b) = -3$  and  $(a - b) = 6$ .
- iii. Factorize the expression  $x^4 - 12x^2 + 4$ .
- iv. Find the square root of  $25x^2 - 60xy + 36y^2$  by division method.
- v. Find the solution set of the inequality  $6 \leq y + 3 < 9$ , where  $y \in R$ . Depict it on the real number line.
- vi. Solve the quadratic equation  $4x^2 - 24x + 20 = 0$  by completing square.
- vii. The product of two consecutive integers is 56. Find the integers.
- viii. Solve the following system of linear equations by Cramer's Rule.

$$\begin{aligned} 3x + 2y &= 0 \\ 4x - 5y &= -23 \end{aligned}$$

- ix. Angles of a triangle are in the ratio 1:2:3. Find their measures.
- x. Construct a rectangle  $ABCD$  when  $\overline{mAB} = 5cm$  and  $\overline{mBC} = 4cm$ .
- xi. In a right-angled triangle  $ABC$ ,  $m\angle A = 90^\circ$ ,  $\overline{mBC} = 13$  and  $\overline{mAB} = 5$ . Find  $\overline{mAC}$ .
- xii. Find the total cost of constructing a stage for a function at Rs. 2200 per  $m^3$ , if the stage is  $7m$  long,  $4m$  wide and  $0.8m$  high.

SECTION – C

Marks: 24

Note: Attempt any THREE questions. All questions carry equal marks.

- Q-3 Factorize the expression  $x^3 + 2x^2 - 3x - 4$  by Factor Theorem.
- Q-4 Verify  $(AB)^{-1} = B^{-1}A^{-1}$  for the matrices:  $A = \begin{bmatrix} 3 & -2 \\ 5 & -3 \end{bmatrix}$ ,  $B = \begin{bmatrix} 4 & -3 \\ 6 & 1 \end{bmatrix}$ .
- Q-5 Construct a  $\triangle ABC$  with  $\overline{mAB} = 6cm$ ,  $m\angle A = 60^\circ$  and  $m\angle B = 75^\circ$ . Also draw its medians and verify their concurrency.
- Q-6 Use distance formula to show that the points  $A(5,3)$ ,  $B(5,2)$  and  $C(8,2)$  form a right angled triangle.