

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° , 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 8cm . 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 5cm is:
 (a) 7.85cm^2 (b) 15.71cm^2 (c) 39.27cm^2 (d) 78.54cm^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.