GENERAL MATHEMATICS MODEL CLASS 10

Q-1 Choose the correct option.

Time Allowed: 20 Minutes **SECTION – A** **Marks:** 15

1. 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) $\sqrt{y^2+3y}+2$

2. The value of x^3-x^2-2x-5 at $x=-3$ is:
   (a) -47 (b) -35 (c) -17 (d) 19

3. $x^3+64=$
   (a) $(x-4)(x^2+4x+16)$ (b) $(x-4)(x^2-4x+16)$
   (c) $(x+4)(x^2+4x+16)$ (d) $(x+4)(x^2-4x+16)$

4. Zero of the polynomial $p(y)=y^2-7y+12$ is:
   (a) -4 (b) -3 (c) 4 (d) 7

5. L.C.M of $(y-4)^2$ and y^2-16 is:
   (a) $(y-4)$ (b) $(y+4)$ (c) $(y+4)(y-4)$ (d) $(y-4)^2(y+4)$

6. The solution set of $5y-3=-23$ is:
   (a) $\left\{-\frac{26}{5}\right\}$ (b) $\{-4\}$ (c) $\{4\}$ (d) $\left\{\frac{26}{5}\right\}$

7. $x \le y$ 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

8. 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) $\sqrt{x^2-2x+5}=0$

9. 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) $\begin{bmatrix}3 & 0\\ 0 & 2\end{bmatrix}$

10. The determinant of matrix $A=\begin{bmatrix}4 & -3\\ 5 & -2\end{bmatrix}$ is:
    (a) -23 (b) -7 (c) 7 (d) 23

11. 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) $\begin{bmatrix}3 & 4\\ -6 & 1\end{bmatrix}$

12. If the sum of measures of two angles is 90^o, then these angles are called:
    (a) adjacent angles (b) supplementary angles
    (c) complementary angles (d) vertically opposite angles

13. The length of one of the sides of an equilateral triangle is $8cm$. Its area is:
    (a) $2\sqrt{3}\ cm^2$ (b) $8\sqrt{3}\ cm^2$ (c) $16\sqrt{3}\ cm^2$ (d) $64\sqrt{3}\ cm^2$

14. 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) $78.54cm^2$

15. The point which lies in the quadrant II is:
    (a) $(2,5)$ (b) $(2,-5)$ (c) $(-2,-5)$ (d) $(-2,5)$

Note: Time allowed for Section-B and Section-C is 2 hours and 40 minutes.

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 $6 \le y+3 < 9$, 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.

$$3x+2y=0$$
$$4x-5y=-23$$

ix. Angles of a triangle are in the ratio 1:2:3. Find their measures.

x. Construct a rectangle $ABCD$ when $m\overline{AB}=5cm$ and $m\overline{BC}=4cm$.

xi. In a right-angled triangle ABC, $m\angle A=90^\circ, m\overline{BC}=13$ and $m\overline{AB}=5$. Find $m\overline{AC}$.

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 ΔABC with $m\overline{AB}=6cm$, $m\angle A=60^\circ$ 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.