

Time: 2 Hours 40 Minutes

SECTION-B

Marks: 36

1. Attempt any nine of the following. All carry equal marks.

i. If  $C = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$  show that  $(C^t)^t = C$

ii. Solve the following system of linear equations using Cramer's rule:  $x - 2y = 5$ ,  $2x - y = 6$

iii. Find the quotient  $\frac{Z_1}{Z_2}$  where  $Z_1 = 3 - 4i$ ,  $Z_2 = 4 + 5i$

iv. Simplify with the help of logarithm  $(28.65)^{\log 28.65}$

v. If  $x = \sqrt{10} + 3$  find the values of  $x - \frac{1}{x}$  and  $x^2 + \frac{1}{x^2}$

vi. Factorize  $a^2 - b^2 + 2b - 1$

vii. Factorize  $81x^4 + \frac{1}{81x^4} - 14$

viii. If product of two polynomials is  $x^4 + 6x^3 - 3x^2 - 56x - 48$  and their LCM is  $x^3 + 2x^2 - 11x - 12$ . Find their HCF.

ix. For what value of  $k$  the expression  $4x^4 + 32x^2 + 96 + \frac{128}{x^2} + \frac{k}{x^4}$  will become a perfect square?

x. Find the solution set of  $|3x - 5| + 7 = 11$

xi. Graph the equation  $x + 2y = 6$

xii. Simplify  $\frac{2x}{3x-12} + \frac{x^2-2x}{x^2-6x+8}$

SECTION-C

Marks: 24

NOTE: Attempt any three of the following questions. All questions carry equal marks.

2. Show that the points A(3,2), B(9,10) and C(1,16) are the vertices of an isosceles triangle.

3. If two angles of a triangle are congruent then the sides opposite to them are also congruent.

4. Prove that any point on the right bisector of a line segment is equidistant from its end points.

5. Construct  $\triangle KLM$  such that  $m\overline{KL} = m\overline{KM} = 5.1\text{cm}$  and  $m\angle K = 65^\circ$