

First Internal Assessment CC2

Examination, 2019

Sub Mathematics

Time: 40 minutes

F.M. : 20

Answer any two (2) from (1), (2), (3) and any two (2) from (4), (5), (6). 4/5 = 20

1) Show that

$$\sin 7\theta = 7 \sin \theta - 56 \sin^3 \theta + 112 \sin^5 \theta - 64 \sin^7 \theta.$$

2) The roots of the equation  $x^3 + px^2 + qx + r = 0$  ( $r \neq 0$ ) are  $\alpha, \beta, \gamma$ . Find the equation whose roots are  $\frac{\alpha+\beta}{\gamma}, \frac{\beta+\gamma}{\alpha}, \frac{\gamma+\alpha}{\beta}$ .

3) Solve the equation.  $2x^4 + 2x^3 - 33x^2 - 10x + 5 = 0$  provided product of two roots is 1.

4) Find the eigen values and eigen vectors of the real matrix:

$$A = \begin{pmatrix} 1 & -1 & 2 \\ 2 & -2 & 4 \\ 3 & -3 & 6 \end{pmatrix}$$

5) Determine  $k$  so that the set  $S$  is linearly dependent in  $\mathbb{R}^3$ .

$$S = \{ (k, 1, 1), (1, k, 1), (1, 1, k) \}.$$

6) Show that the sets of vectors are linearly independent in  $\mathbb{R}^3$ .

$$\{ (1, 2, 3), (2, 3, 1), (3, 1, 2) \}.$$