

A Charutar Vidya Mandal's Institution

V. P. & R. P. T. P. SCIENCE COLLEGE

(AUTONOMUS) (Grant-in-Aid) Affiliated to Sardar Patel University

B. Sc. (Semester 2) Internal Practical Examination

US02MIMTH02: Problems and exercises in Matrices and complex numbers (Practical)

Date: 24-02-2025, (Monday)

Time: 2:00 pm to 3:30 pm

Total marks: 20

NOTE: The symbols used in this paper have usual meaning unless specified.

Q. 1 Attempt any four.

(4 × 5 = 20)

1. Find l , m , n and A^{-1} if

$$A = \begin{bmatrix} 0 & 2m & n \\ l & m & -n \\ l & -m & n \end{bmatrix}$$

is orthogonal matrix.

2. Find the inverse of the matrix

$$\begin{bmatrix} 1 & -1 & 0 & 2 \\ 0 & 1 & 1 & -1 \\ 2 & 1 & 2 & 1 \\ 3 & -2 & 1 & 6 \end{bmatrix}.$$

3. Investigate for what values of λ and μ the system of equations

$$x + 2y + z = 8$$

$$2x + 2y + 2z = 13$$

$$3x + 4y + \lambda z = \mu$$

has (i) no solution, (ii) a unique solution, (iii) infinitely many solutions.

4. Solve the following system of equations by using Gauss Jordan elimination method.

$$x - y + 2z - w = -1, \quad 2x + y - 2z - 2w = -2, \quad -x + 2y - 4z + w = 1, \quad 3x - 3w = -3$$

5. Use Crammer's theorem to solve the system of equations

$$x + 2y + z = 5, \quad 3x - y + z = 6, \quad x + y + 4z = 7$$

6. Find all values of $\left(\frac{1}{2} + i\frac{\sqrt{3}}{2}\right)^{\frac{1}{4}}$

