

Indian Institute of Space Science and Technology

Thiruvananthapuram

MA211- Linear Algebra, Complex Analysis and Fourier Series

Quiz - I

Date : 12-09-2022

Max. Marks: 15

1. Test for consistency and solve, if solution exists, the following system of equations using Gauss-Jordan elimination method.

$$3x + y + z = 2$$

$$x - 3y + 2z = 1$$

$$7x - y + 4z = 5.$$

3 marks

2. For what values of α and β the following system of equations

$$3x - 2y + z = \beta$$

$$5x - 8y + 9z = 3$$

$$2x + y + \alpha z = -1$$

has (i) unique solution

(ii) infinitely many solutions

(iii) no solutions.

3 marks

3. Find the eigenvalues and corresponding eigenvectors of the matrix

$$A = \begin{bmatrix} 1 & 1 & -2 \\ -1 & 2 & 1 \\ 0 & 1 & -1 \end{bmatrix}.$$

3 marks

4. For what values of k the set of vectors $\{ (k, 1 - k, k), (0, 3k - 1, 2), (-k, 1, 0) \}$ form a basis for R^3 .

3 marks

5. Check whether $W = \left\{ \begin{bmatrix} a & b \\ c & d \end{bmatrix} / 2a - c - d = 0 \text{ and } a + 3b = 0 \right\}$ is a subspace of $M_{2 \times 2}(R)$ and if so, find a basis for the subspace.

3 marks
