SET A

Enrolment No.-.....

B. Tech.(Semester I), Minor Examination, Oct. 2024

Subject: Applied Mathematics-I(MATH-114)

Time:1 Hour **Max. Marks: 20**

Note: Attempt any four questions. Each question carries equal marks.

1. Find the rank of the matrix A where $A = \begin{bmatrix} 2 & 3 & 4 & -1 \\ 5 & 2 & 0 & -1 \\ -4 & 5 & 12 & -1 \end{bmatrix}$.

2. For what values of η the equations

$$x + y + z = 1$$
$$x + 2y + 4z = \eta$$
$$x + 4y + 10z = \eta^2$$

have a solution?

3. Find the eigenvalues and eigenvectors of the matrix $\begin{bmatrix} 1 & 4 \\ 3 & 2 \end{bmatrix}$.

4. Use Cayley Hamilton theorem to find A^{-1} where $A = \begin{bmatrix} 1 & 2 & 0 \\ -1 & 1 & 2 \\ 1 & 2 & 1 \end{bmatrix}$.

5. Solve the following system of equations using Gauss Elimination method:

$$2x + 3y - z = 5$$
$$4x + 4y - 3z = 3$$
$$2x - 3y + 2z = 2$$