HANDIQUE GIRLS' COLLEGE
DEPARTMENT OF STATISTICS
ASSIGNMENT ON LINEAR ALGEBRA AND SYSTEM OF EQUATIONS
SEMESTER: FYUGP 4th SEMESTER **SESSION: 2025-26**
DATE OF ASSIGNMENT:29-04-2026 **DATE OF SUBMISSION :10-05-2026**

Answer either SET-A or SET-B

SET-A

1. 1. Define vector space. State the properties of vector Space
2. Define linearly independent set of vectors and basis of a vector space.
3. Show that the vectors $X_1 = (1, 2, 3)$ and $X_2 = (2, -2, 0)$ form a linearly independent set.
4. Prove that the intersection of any two subspace is also a subspace.
5. Show that every super set of a linearly dependent set of vectors is linearly dependent.

SET-B

1. State and Prove that the Cayley-Hamilton theorem.
2. Prove that the rank of a product of two matrices can not exceed the rank of either of the matrices
3. Write down the procedure of Jacobi's iterative method to solve linear algebraic equations
4. Prove that the following systems of equations are consistent

$$x-y+z=2$$
$$3x-y+2z=6$$
$$3x+y+z=-18$$

5. Solve the system of non-homogeneous linear equations

$$x-2y+3z=5$$
$$4x+3y+4z=7$$
$$x+y-z=-4$$

using Cramer rule