

SCHOOL OF APPLIED SCIENCE & HUMANITIES

DEPARTMENT OF MATHEMATICS

Subject: Linear Algebra

Sem. : I

Section: 7

Subject Code : 25MT103

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Regulation: R25

T5 - Assignment 5

1. Define the following.
 - a. Vector space.
 - b. Subspace.
 - c. Span of Vectors.
 - d. Linear Independent Vectors.
 - e. Basis and Dimension of Vector space.
2. Determine if the following vectors are linearly dependent or independent.
 - a. $\{(1,2,1), (2,4,3), (0,1,1)\}$.
 - b. $\{(3,0,0), (0,3,0), (0,0,3)\}$.
 - c. $\{(1,0,0,1), (0,1,0,1), (0,0,1,1), (0,0,0,1)\}$
 - d. $\{(1,0,0,1), (0,1,0,1), (0,0,1,1), (0,0,0,0)\}$
3. Determine if the following sets are subspaces. If so, calculate the basis and dimension.
 - a. $W = \{f : \mathbb{R} \rightarrow \mathbb{R} \mid f(0) = 1\}$
 - b. $W = \{f : \mathbb{R} \rightarrow \mathbb{R} \mid f(0) = 0\}$
4. Determine if the set of all symmetric 2×2 matrices forms a subspace of $\mathbb{R}^{2 \times 2}$.