SCHOOL OF APPLIED SCIENCE & HUMANITIES
DEPARTMENT OF MATHEMATICS

Subject: Linear Algebra   Subject Code   : 25MT103
Sem.   : I   Academic Year: 2025-2026
Section: 7   Regulation: R25

T5 - Assignment 6

1. Define the following.
   a. Real Inner Product Space
   b. Norm of a vector
   c. Cauchy-Schwarz inequality

2. Show that the function $< f,g > = \int_{-2}^{2}(1 + x^2)\, f(x)\, g(x)\, dx$ defines an inner product on C[-2,2].

3. In $\mathbb{R}^2$ with inner product $< x,y >= x^T C y$, where $C = \begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix}$, compute $||x||_C,\ (1,3)^T$.

4. In $\mathbb{R}^3$ with inner product $< x,y >= x^T B y$, where $B = \begin{bmatrix} 3 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 1 \end{bmatrix}$, compute $||x||_B,\ (2,-1,4)^T$.