

National University of Computer and Emerging Sciences, Lahore Campus

	Course:	Linear Algebra	Course Code:	MT 104
	Program:	BDS & BCS	Semester:	Spring 2022
	Duration:	60 mins.	Total Marks:	30
	Paper Date:	07-05-2022	Weight	12.5%
	Section:	BDS-4D & BCS-4E (all)	Page(s):	1
	Exam:	Sessional - II	Roll No:	
Instruction/Notes:	Attempt All Questions			

Question 1: [5,5]

- (a) Let $\underline{v} = (1, 2, 2, -3, -1)$, find all values of k such that $||k\underline{v}|| = 6$.
 (b) Find vector component of \underline{u} along \underline{v} and vector component of \underline{u} orthogonal to \underline{v} .
 $\underline{u} = (x, y), \underline{v} = (a, b)$

Question 2: [5,5]

- (a) Find the equation of plane passing through the points $P(9, 0, 4)$, $Q(-1, 4, 3)$, $R(0, 6, -2)$.
 (b) Show that polynomials form a basis for P_2 .
 $x^2 + 1, x^2 - 1, 2x - 1$

Question 3: [10]

Bases are: $B = \{u_1, u_2\}, B' = \{v_1, v_2\}$ for R^2 . Find the transition matrix from B' to B by two different methods.

$$u_1 = \begin{bmatrix} 2 \\ 2 \end{bmatrix}, \quad u_2 = \begin{bmatrix} 3 \\ -1 \end{bmatrix}, \quad v_1 = \begin{bmatrix} 3 \\ 1 \end{bmatrix}, \quad v_2 = \begin{bmatrix} -1 \\ -1 \end{bmatrix}$$