UNIVERSITY OF CENTRAL PUNJAB LAHORE
Assignment 2
CLO Mapping: CLO2

Course Code	MAT243		Semester	Fall 2025
Course Title	Multivariable Calculus			
Resource Person	Ms. Seema Mazhar			
Assignment Given Date	11-11-2025	Submission Date		14-11-2025
Total Marks	15 marks (assignment)+5 marks (viva) =20 marks			
CLO 2	The students will be able to associate vector calculus concepts, including function of several variables, directional derivatives to solve problems involving vectors, lines, and planes in 3D and to demonstrate solution of optimization problems.			

Name of student	Complete Registration no.	Section	Assignment marks	Viva Marks	Total

Submission Instructions *(Please follow strictly)*

- **It is COMPULSORY to attach this page as the title page of your assignment. Failure to do so will lead to 2 marks deduction.**

- **Work should be neat and with ALL computational steps.**

- **This is an INDIVIDUAL assignment so mention all detail as asked.**

- **LATE SUBMISSION WILL NOT BE ACCEPTED.**

- **All Plagiarized assignments will be awarded deduction of 2 marks for each match.**

- **Do work on assignment papers or A4 sheets.**

I declare that I have prepared the assignment according to above guidelines, and I shall be responsible for any deduction of marks if the instructions are not followed.

Student signature: _____

1. (5 marks) A particle's position at time t is given by

$$\vec{r}(t) = \ln(5 - x^3)\hat{\imath} + \frac{1-t}{t^2-3}\hat{\jmath} - 2e^{\frac{7}{t}}\widehat{k}.$$

What is the *domain* of the given vector?

2. (10 marks) **Find** the ***position vector*** of the particle that has the given *acceleration vector*

$$\vec{a}(t) = sin(2t)\hat{\imath} - 6cos\,(3t)\hat{\jmath} + \frac{25t^4}{2}\hat{k}$$

when $\vec{v}(0) = 2\hat{\imath}$ and $\vec{r}(\pi) = \hat{\imath} + \hat{\jmath} + \hat{k}.$

Best of Luck!!