Name. _____ **Student Admn. No.:** _____	**Printed Pages:01**

School of Basic Sciences

Back Paper Examination Even Semester (Non - Graduating Batches) – June 2024

[Programme: B.Tech] [Semester: IV] [Batch:]

Course Title: Multivariable Calculus **Course Code: C1UC423B**	**Max Marks: 100** **Time: 3 Hrs.**

Instructions:

1. *All questions are compulsory.*
2. *Assume missing data suitably, if any.*

		K Level	COs	Marks
	SECTION-A (15 Marks) **5 Marks each**			
1.	Solve: $\left(\frac{4-7n^6}{n^6+3}\right)$.	K2	CO1	5
2.	Compute: $\int_0^2 \int_0^2 2x\, dydx$	K1	CO3	5
3.	Find the gradient of the scalar field $f(x, y) = x^2y^3$.	K2	CO4	5
	SECTION-B (40 Marks) **10 Marks each**			
4.	Apply Rolle's theorem to find the value of c for the function $f(x) = x^3 - 3x^2 + 2x + 2$ in the interval $[0, 1]$.	K2	CO2	10
5.	Find dy/dx if $y^2 - x^2 - \sin sin\, xy = 0$	K3	CO2	10
6.	Find the Maclaurin series generated by $f(x) = e^x$.	K4	CO1	10
7.	Show that the limit does not exist of the function: $\frac{2xy}{x^2+y^2}$	K3	CO2	10
	SECTION-C (45 Marks) **15 Marks each**			
8.	Show that series $\frac{1}{9} + \frac{1}{27} + \frac{1}{81} +$... is convergent and find its sum.	K4	CO1	15
9.	Evaluate: $\int_0^2 \int_0^2 \int_0^2 xyz\, dx\, dy\, dz$.	K4	CO3	15
10	Compute using L' Hospital : (*I*) $\frac{x^2}{e^x}$ $\frac{1}{x} \ln ln\, x$	K4	CO3	15