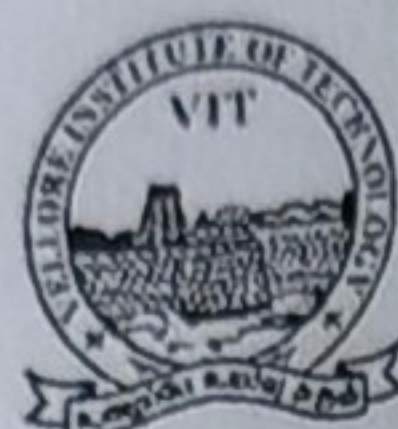




SCHOOL OF ADVANCED SCIENCES
CONTINUOUS ASSESSMENT TEST - I
FALL SEMESTER 2026-2027

Programme Name & Branch : B.Tech.
Course Code and Course Name : BAMAT101 - Multivariable Calculus and Differential Equations
Faculty Name(s) : Common to all B1+TB1 slot
Class Number(s) : Common to all B1+TB1 slot
Date of Examination : 10.08.2026
Exam Duration : 90 minutes
Maximum Marks: 50

General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes:
 1. Evaluate partial derivatives and solve optimization problems involving several variables with or without constraints.
 2. Solve multiple integrals in cartesian, polar, cylindrical and spherical coordinates.

Q. No	Question	M	CO	BL
1.	If $u = e^{x+y}$, $v = e^{y+z}$, $w = e^{x+2y+z}$ then: a) Find $\frac{\partial(u,v,w)}{\partial(x,y,z)}$. b) Determine whether the functions u , v , w are dependent or independent. c) If u , v , w are dependent, then obtain a functional relation among them.	10	1	1
2.	Using Taylor's expansion for a function of two variables, obtain the expansion of $f(x,y) = \cos(y-1)e^x$ about the point $(0, 1)$, retaining all terms of total degree not exceeding three.	10	1	2
3.	The temperature on the surface of a spherical metallic component is modeled by $T(x,y,z) = 2x + 3y + z + 500$. The component has a spherical surface given by $x^2 + y^2 + z^2 = 14$. Determine the point on the surface where the temperature is highest and find the maximum temperature.	10	1	3
4.	Sketch the region of integration R , and evaluate the double integral bounded by curves $y = x^2$, $y = 2 - x$, $x = 0$, and $x = 1$: $I = \iint_R (x^2 + y^2) dy dx.$	10	2	1
5.	Change the order of integration and evaluate $\int_0^2 \int_{\sqrt{2x}}^2 e^{y^3} dy dx.$	10	2	2