



**SCHOOL OF ADVANCED SCIENCES
CONTINUOUS ASSESSMENT TEST - I
FALL SEMESTER 2025-2026**

SLOT: D2+TD2

Programme Name & Branch : B.Tech.,
Course Code : BAMAT101
Course Name : Multivariable Calculus and Differential Equations
Class Number : Common to all D2+TD2 slot
Date of Examination : 20-Aug-2025
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)

CO-1: Evaluate partial derivatives and solve optimization problems involving several variables with or without constraints.

CO-2: Solve multiple integrals in Cartesian, polar, cylindrical and spherical coordinates.

Q. No	Questions	M	CO	BL
1.	If $u = \frac{x+y}{x-y}$, $v = \frac{xy}{(x-y)^2}$ verify whether u, v are functionally dependent. If so find the relation between them.	10	1	2
2.	Expand $\log(1+x+y)$ about $(0,0)$ up to the third term using Taylor's series.	10	1	3
3.	A thin closed rectangular box is to have one edge equal to twice the other, and a constant volume 72 m^3 . Find the least surface area of the box.	10	1	2
4.	Evaluate $\iint_D (x-y) dx dy$ over a region bounded by curves $x = y^2$ and $x = \frac{y^2}{2} + 1$. Sketch a diagram of the region.	10	2	2
5.	Change the order of integration $\int_0^1 \int_y^{2-y} x y dx dy$ and hence evaluate it.	10	2	3
