VIT

Vellore Institute of Technology

Vellore – 632014, Tamil Nadu, India
DEPARTMENT OF MATHEMATICS
SCHOOL OF ADVANCED SCIENCES
FALL SEMESTER 2022-2023

CONTINUOUS ASSESSMENT TEST – II

Programme Name & Branch : B.Tech
Course Code : BMAT101L
Course Name : Calculus
Slot : B2+TB2
Duration : 90 minutes **Max. Marks : 50**

General instruction(s): Answer all the questions

Q. No	Question	Marks	Course Outcome (CO)	Bloom's Taxonomy (BL)
1.	Obtain the Taylor series expansion for $f(x, y) = e^{-(x^2+y^2)}$ in powers of $x-1$ and $y-2$ up to the terms of second order.	10	CO2	BL2
2.	Obtain the extreme values of $f(x, y) = 2x^3 + 6xy^2 - 3y^3 - 150x$.	10	CO2	BL3
3.	Evaluate $\iint_R xy(x+y)\,dx\,dy$ over the region R bounded by $xy = 6$ and $x + y = 7$.	10	CO3	BL3
4.	Evaluate $\iiint_E dV$, where E is the region bounded below by the cone $z = \sqrt{x^2 + y^2}$ and above by the sphere $z = x^2 + y^2 + z^2$ using spherical polar coordinates.	10	CO3	BL3
5.	a) Evaluate $\int_0^\infty x^3 3^{-x}\,dx$ using gamma function.	5	CO4	BL1
	b) Evaluate $\int_0^1 \frac{x^2}{\sqrt{1-x^4}}\,dx$ using beta and gamma functions.	5	CO4	BL1