VIT
Vellore Institute of Technology

FALL SEMESTER 2022-2023
SCHOOL OF ADVANCED SCIENCES
DEPARTMENT OF MATHEMATICS
CONTINUOUS ASSESSMENT TEST – II

Course Code	: BMAT101L
Course Name	: Calculus
Slot	: C2+TC2
Date of Examination	: 13.12.2022
Duration	: 90 Minutes

General Instructions:

Max. Marks: 50

Answer all the following questions.

Q.No	Question	Marks
1.	Find the Taylor's series expansion of $\tan^{-1}\left(\frac{y}{x}\right)$ in powers of $(x-1)$ and $(y-1)$ upto third degree terms.	10
2.	Find the minimum of the function $f = x^2 + y^2 + xy + ax + by$.	10
3.	Change the order of integration in $\int_0^1 \int_x^{2-x} \left(\frac{x}{y}\right) dy\, dx$ and then evaluate it.	10
4.	If R is the region bounded by the cylinder $x^2 + y^2 = 1$ and the planes z=2 and z=3, then evaluate $\iiint_R$ dxdydz using cylindrical polar coordinates.	10
5.	Evaluate $\int_0^1 \frac{x^2}{\sqrt{1-x^4}} dx$ in terms of Gamma function.	10