VIT
Vellore Institute of Technology

Fall Semester 2019-20

Continuous Assessment Test – II

Programme Name & Branch: B. Tech.

Course Name & Code: Calculus for Engineers (MAT1011)

Slot: B1+TB1

Exam Duration: 90 minutes

Maximum Marks: 50

Answer All the Questions

S. No.	Question	Course Outcome (CO)
1.	Use Convolution theorem to find the inverse Laplace transform of $\frac{1}{s(s^2+2s+1)}$ (5m)	2
2.	(a) Is the function $f(x,y)=\begin{cases}\frac{xy(x^2-y^2)}{x^2+y^2} & ;(x,y)\neq(0,0)\\ 4 & ;(x,y)=(0,0)\end{cases}$ continuous at origin? Redefine if necessary to make it continuous at $(0,0)$ (5m)	3
	(b) Find the rate at which the area of a rectangle is increasing at a given instant when the sides of the rectangle are 4 ft and 3 ft and are increasing at the rate of 1.5 ft/sec and 0.5 ft/sec respectively. (5m)	3
	(c) If $u=x+2y^2-z^3$, $v=2x^2yz$, $w=2z^2-xy$,then find $\frac{\partial(u,v,w)}{\partial(x,y,z)}$ at the point $(1,-1,0)$ (5m)	3
3.	Find the Taylor's series expansion of $\sqrt{1+x+y^2}$ in powers of $(x-1)$ and $(y-0)$ (10m)	3
4.	Find the minimum distance from the origin to the plane $x+2y+3z=14$ using Lagrange's method of undetermined multipliers (10m)	4
5.	Change the order of integration $\int_0^1\int_x^{\sqrt{2-x^2}}\frac{x}{\sqrt{x^2+y^2}}\,dx\,dy$ and hence evaluate (10m)	4