Reg. No.:

Name :

VIT

Vellore Institute of Technology

Continuous Assessment Test (CAT) – I August 2019

Programme	:	B. Tech	Semester	:	FALL 2019 - 2020
Course Title	:	Calculus for Engineers	Code	:	MAT1011
Faculty (s)	:	Devi yamini S Saroj kumar dash Berin greeni A Anuradha J Parthiban V	Slot	:	B2+TB2
			Class Nbr(s)	:	CH2019201000442 CH2019201000444 CH2019201000445 CH2019201000485 CH2019201000494
Time	:	90 Minutes	Max. Marks	:	50

Answer all the Questions

1.		Locate the intervals in which $f(x) = xe^{-x}$ is increasing, decreasing, concave up and concave down.	10
2.	a)	Using Mean Value Theorem show that $f(x) = x^3 - 7x^2 + 25x + 8$ has exactly one real root.	5
	b)	Find the area of the region enclosed by $y^2 = x$ and $y = x - 2$.	5
3.		Sketch the lemniscate curve $y^2 = x(x-4)^2$ and find the volume of the solid of revolution formed the closed loop of the curve is rotated about the x- axis.	10
4.	a)	Find two positive numbers whose sum of twice the first and seven times the second is 600 and whose product is a maximum.	5
	b)	Find the Laplace transform of $e^{-2t}\left(t^2 - 3t + 6\right)\sin t$	5
5.		Find $L\left[t\int_0^t e^{-2t}\sin 2t\,dt\right]$.	10

SEARCH VIT QUESTION PAPERS ON TELEGRAM TO JOIN