VIT
Vellore Institute of Technology

A1+TA1+TAA1

SCHOOL OF ADVANCED SCIENCES

WINTER SEMESTER 2021-2022 - CAT-II (May 2022)

Programme Name & Branch: B.Tech. **Course Code: BMAT102L**

Course Name: Differential Equations and Transforms

Exam Duration: 90 minutes **Max. Marks:50**

General instruction(s):Answer ALL the Questions

S.No.	Question	Marks
1.	Find the inverse Laplace transformation of $\frac{s^2}{(s^2+9)(s^2+25)}$ using Convolution theorem.	10M
2.	Find the inverse Laplace transform of $\frac{s}{s^4+s^2+1}$ using partial fraction method.	10M
3.	Solve $x''(t)+3x'(t)+2x(t)=u(t-2)$, with $x(0)=0$ and $x'(0)=0$ using the method of Laplace transform.	10M
4.	Solve the partial differential equation $\frac{\partial u(x,t)}{\partial t}+u(x,t)=\frac{\partial u(x,t)}{\partial x}$, $u(x,0)=6e^{-3x}$, which is bounded for all $x>0$; $t>0$; using the method of Laplace Transform.	10M
5.	Expand $f(x)=\left(\frac{\pi-x}{2}\right)^2, 0<x<2\pi$ in a Fourier series.	10M