VIT
Vellore Institute of Technology

REG.NO.:

SCHOOL OF ADVANCED SCIENCES
CONTINUOUS ASSESSMENT TEST - I
WINTER SEMESTER 2024-2025

SLOT: D2+TD2+TDD2

Programme Name & Branch : B Tech
Course Code and Course Name : BMAT102L-Differential Equations and Transforms
Faculty Name(s) : Common
Class Number(s) :
Date of Examination : 30.01.2025
Exam Duration : 90 minutes **Maximum Marks: 50**

General instruction(s): Answer All Questions

Q. No	Question	M	CO	BL
1.	Find the general solution of the equation $y''+16y=32\sec 2x$, using the method of variation of parameters.	10	1	2
2.	Find the solution of the equation $x^2y''+5xy'+3y=\ln x,\ x>0$, using the method of undetermined coefficient.	10	1	2
3.	The charge $q(t)$ on the capacitor is given by the differential equation $10q''+120q'+1000q=17\sin 2t$. At the time 0 the current is zero and the charge on the capacitor is $(1/2000)$ coulombs. Find the charge on the capacitor for $t>0$.	10	1	3
4.	(i) Find the general solution of the Lagrange's equation $2yzp+zxq=3xy$ (5M) (ii) Eliminate arbitrary functions f, g from $z=f(x+iy)+g(x-iy)$ and hence obtain the partial differential equation. (5M)	10	2	2
5.	Using the method of separation of variables, solve the equation $\frac{\partial u}{\partial x}=2\frac{\partial u}{\partial t}+u$ where $u(x,0)=6e^{-3x}$.	10	2	2

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