VIT

Vell stitute of Technology

DEPARTMEN MATHEMATICS

SCHOOL OF A NCED SCIENCES

Winter S ster 2022-23

Continuous Assess t Test – I, March 2023

Course Code : BMAT102L

Course Name : Differential Equations Transforms

Duration : 90 minutes

Date of Exam: 27.03.2023

Slot : B2+TB2+TBB2

Max. Marks : 50

Answer A he Questions

Q. No	Question	Marks
1.	Solve the differential equation $\frac{d^2y}{dx^2}-2\frac{dy}{dx}+y=x^2-3x$ by the method of undetermined coefficients.	10M
2.	Solve the differential equation $x^2\frac{d^2y}{dx^2}-4x\frac{dy}{dx}+6y=x^2$ by the method of variation of parameters.	10M
3.	If a voltage of 100 cos10t V is impressed on a circuit containing elements with resistance 40 Ω, inductor 1 H and capacitance 16×10^{-4} F in series, then find the charge at time t in the circuit.	10M
4.	i) Form a partial differential equation by eliminating the arbitrary functions from the relation $z=f\left(\frac{xy}{z}\right)$.	5M
	ii) Find the complete solution of the partial differential equation $z^2=1+p^2+q^2$, where $p=\frac{\partial z}{\partial x}$ and $q=\frac{\partial z}{\partial y}$.	5M
5	Find the general solution of the partial differential equation $\left(\frac{b-c}{a}\right)yzp+\left(\frac{c-a}{b}\right)xzq=\left(\frac{a-b}{c}\right)xy$, where $p=\frac{\partial z}{\partial x}$ and $q=\frac{\partial z}{\partial y}$.	10M