

**VIT**

Vellore Institute of Technology

SCHOOL OF ADVANCED SCIENCES
CONTINUOUS ASSESMENT TEST-1
WINTER SEMESTER-23-24

Course Name: Differential equations and transforms Course code: BMAT102L
Programme: B.Tech

Class Number: VL2023240501534

Slot: C1+TC1+TCC1

Faculty Name: Dr.K.Indhira Exam Duration: 90 Minutes

Maximum Marks: 50

ANSWER ALL THE QUESTIONS

Q.No.	Questions	Max Marks	CO	BL
1.	Solve the differential equation $\frac{d^2y}{dx^2} - y = \frac{2}{1+e^x}$ by the method of variation of parameters.	10	CO1	BL2
2.	Solve the differential equation $(x^2D^2 + 3xD + 5)y = x\cos(\log x)$	10	CO1	BL2
3.	In an L-C-R circuit the impressed voltage is $400\cos 250t$ volts. Find the current in the circuit when $t = 0.001$ second, if $L = 1$ henry, $R = 400$ ohms and $C = 0.000016$ Farad and the initial charge and the current are zero.	10	CO1	BL3
4.	(i) Form the partial differential equation by eliminating the arbitrary function f in $z = xy + f(x^2 + y^2)$ (5) (ii) Solve $p^2 + pq = z^2$ (5)	10	CO2	BL2
5.	Solve $x(z^2 - y^2)p + y(x^2 - z^2)q = z(y^2 - x^2)$	10	CO2	BL2