Register Number

Name

VIT

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

Continuous Assesment Test - II, March 2023
Open Book Examination

Programme	:	B.Tech.	Semester	:	WIN 2022 - 2023
Course	:	Differential Equations and Transforms	Code	:	BMAT102L
			Slot	:	C2+TC2+TCC2
Faculty	:	Dr. V. Parthiban Dr. Pankaj Shukla Dr. Somnath Bera Dr. Biswajit Mallick Dr. Kalyan Dr. A. Felix	Class Nbr	:	CH2022235002171 CH2022235002172 CH2022235002173 CH2022235002590 CH2022235002591 CH2022235002704
Time	:	90 Mins.	Max.Marks	:	50

Answer all the questions

($5 \times 10 = 50$ Marks)

Q.No.	Question Description	Marks
1. a)	Find the Laplace transform of $f(t) = t^2 e^{-2t}\cos(5t)$	5
b)	Find the Laplace transform of $f(t) = \begin{cases} t-3, & 3 \le t \le 4 \\ 5-t, & 4 \le t \le 5 \end{cases}$.	5
2.	Find the inverse Laplace transform of $\frac{s+4}{(s^2+8s+15)^2}$.	10
3.	Solve $y'' - 7y' + 6y = e^t + \delta(t-2) + \delta(t-4)$, $y(0) = 0, y'(0) = 0$ using Laplace transform technique	10
4.	Solve $u_x + 4u_t = -8t$, $u(x,0) = 0, u(0,t) = 2t^2$ using Laplace transform technique.	10
5.	Find the Fourier series of the function $f(x) = x(2\pi - x)$ in $(0, 2\pi)$ with period 2π. Deduce the sum of the series $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \cdots \infty$.	10

⇔⇔⇔⇔