FALL SEM. 2019-20

VIT
Vellore Institute of Technology

Continuous Assessment Test – II

Programme Name & Branch: B. Tech

Course Name & Code: Application of differential and difference equations (MAT2002)

Slot: G2+TG2

Exam Duration: 90 minutes

Maximum Marks: 50

Answer All the Questions (10 x 5 = 50 Marks)

S.No.	Question	(CO)
1.	Using the method of variation by parameter, find the particular solution of the ordinary differential equation $$\frac{d^2y}{dx^2} - 7\frac{dy}{dx} + 6y = x^2 + e^{2x}.$$	
2.	Find the general solution of the ordinary differential equation $$(3x+1)^2\frac{d^2y}{dx^2} + 9(3x+1)\frac{dy}{dx} - 162y = (\log(3x+1)^3)^3$$	
3.	Using Laplace transform solve the initial value problem $$\frac{d^2y}{dt^2} - 10\frac{dy}{dt} + 9y = 5t,\ \ y(0) = -1, y'(0) = 2.$$	
4.	Find the general solution of the system of ordinary differential equations $$\frac{dx}{dt} = y(t) + z(t),$$ $$\frac{dy}{dt} = x(t) + z(t),$$ $$\frac{dz}{dt} = x(t) + y(t).$$	
5.	Find the power series solution of the differential equation $$\frac{d^2y}{dx^2} + (1+x)\frac{dy}{dx} + x^2y = 0.$$	

$(s-1)(s-9)$

$s^2 - 9s - s + 9$ $\quad s = -10 \quad -1 + -9$

$s^2 - 10 + 9$ $\quad p = 9 \quad -1 \times -9$

$s^2 - s$