

# 18MAB101T- CALCULUS AND LINEAR ALGEBRA

## Unit-III Ordinary Differential Equations

### ASSIGNMENT

#### Part-B

1. Solve  $\frac{d^2y}{dx^2} + a^2y = \tan ax$ , using method of variation of parameters.
2. Solve  $\frac{d^2y}{dx^2} + y = x \sin x$ , using method of variation of parameters.
3. Solve  $(x^2D^2 - xD + 1)y = \left(\frac{\log x}{x}\right)^2$
4. Solve 
$$\begin{aligned} \frac{dx}{dt} + 2x - 3y &= 5t \\ \frac{dy}{dt} - 3x + 2y &= 2e^{2t} \end{aligned}$$

#### Part-C

1. Solve  $(x^2D^2 + xD + 1)y = \log x \sin(\log x)$
2. Solve 
$$\begin{aligned} Dx - (D - 2)y &= \cos 2t \\ (D - 2)x + Dy &= \sin 2t \end{aligned}$$
3. Solve 
$$\begin{aligned} (D^2 + 4)x + 5y &= t^2 \\ (D^2 + 4)y + 5x &= t^2 + 1 \end{aligned}$$
4. Solve 
$$\begin{aligned} Dx + y &= \sin t \\ x + Dy &= \cos t, \end{aligned}$$
 given that  $x = 2$  and  $y = 0$  at  $t = 0$
5. Solve 
$$\begin{aligned} (2D + 1)x + (3D + 1)y &= e^t \\ (D + 5)x + (D + 7)y &= 2e^t \end{aligned}$$