Unit 2
Ordinary Differential Equations

1. **Solve** $(D^2 + 16)y = \cos 4x$

2. **Solve the following differential equation:** $(x^2 D^2 - 2xD + 2)y = \log x$

3. Solve : $x^2 \dfrac{d^2 y}{dx^2} + x\dfrac{dy}{dx} + y = \log x \sin(\log x)$

4. **By the method of variation of parameters , solve** $\dfrac{d^2 y}{dx^2} + 4y = \tan 2x$

5. **By the method of variation of parameters**: $\dfrac{d^2 y}{dx^2} + y = \sec x$

6. Solve $\dfrac{dx}{dt} + y = \sin t, \dfrac{dy}{dt} + x = \cos t$ given that $x = 2, y = 0$ when $t = 0$.

7. Solve : $(D^2 - 1)y = x^2 + e^{-2x} \sin 2x$

8. Solve : $\dfrac{dx}{dt} - \dfrac{dy}{dt} - y = e^{-t}; x + \dfrac{dy}{dt} - y = e^{2t}$