PARUL UNIVERSITY

Faculty Of Engineering & Technology

Department of Applied Sciences & Humanities

1st year B.Tech Programme (All branches)

Mathematics-II (Subject Code :303191151)

Tutorial-1 (A) Higher Order Differential Equation

1 Solve the following homogeneous linear differential equations with constant coefficients

1. $y'' - 3y' + 2y = 0$.
2. $\frac{d^2y}{dx^2} + 6\frac{dy}{dx} + 9y = 0$.
3. $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 4y = 0;\ y(0) = y'(0) = 1$.
4. $\frac{d^2y}{dx^2} + 9y = 0$.
5. $(D^2 - 2D + 5)y = 0$.
6. $y''' - 2y'' - y' + 2y = 0$.
7. $y''' + y'' - 16y' + 20y = 0; y(0) = 0, y'(0) = 1, y''(0) = 3.$
8. $\frac{d^3y}{dx^3} + y = 0$.
9. $\frac{d^4y}{dx^4} + 8\frac{d^2y}{dx^2} + 16y = 0$.

2 Solve the following differential equations using Undetermined coefficient method

1. $(D^2 - 6D + 7)y = e^{2x}$.
2. $y'' - 3y' + 2y = e^x$.
3. $(D^2 + 16)y = \cos 4x$.
4. $(D^2 + 4)y = 8x^2$.
5. $y''' + 3y'' + 3y' + y = 30e^x$.

3 Solve the following differential equation by variation of parameter

1. $(D^2 + 1)y = \sec x$.
2. $(D^2 + 4D + 4)y = x^2e^x$.
3. $(D^2 - 1)y = e^{-x}\sin\left(e^{-x}\right) + \cos\left(e^{-x}\right)$.