

Assignment –II
MODULE-2
(ORDINARY DIFFERENTIAL EQUATION HIGHER ORDER & FIRST DEGREE)

Solve the following equations by D-operator method: (where $D \equiv \frac{d}{dx}$)

1. $(D^2 - 5D + 6)y = x^2 e^{3x}$
2. $D^2 + 2aD + (a^2 + b^2)y = e^{px}$
3. $(D^2 + 4D + 4)y = 2 \sinh 2x$
4. $(D^2 + a^2)y = \sec ax$
5. $(D^2 - 2D)y = e^x \sin x$

Apply method of variation of parameters to solve the following equations: : (where $D \equiv \frac{d}{dx}$)

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

Solve the following equations: (where $D \equiv \frac{d}{dx}$)

1. $(x^2 D^2 + xD + 1)y = \log x \sin(\log x)$
2. $\{(2 + 3x)^2 D^2 + 5(2 + 3x)D - 3\}y = x^2 + x + 1$
3. $\{(a + x)^2 D^2 - 4(a + x)D + 6\}y = x$
4. $(x^2 D^2 + 4xD + 2)y = x + \sin x$
5. $\{(1 + 2x)^2 D^2 - 6(1 + 2x)D + 16\}y = 8(1 + 2x)^2$

Solve the following equations:

1. $\frac{dx}{dt} + 3x + y = e^t, \frac{dy}{dt} - x + y = e^{2t}$
2. $\frac{dx}{dt} + y = e^t, \frac{dy}{dt} - x = e^{-t}$
3. $\frac{dx}{dt} + 3x - 4y = 0, \frac{dy}{dt} + 2x - 3y = 0$