DELHI TECHNICAL CAMPUS
APPLIED MATHEMATICS -I BS 111
ASSIGNMENT -2

1.Solve: $\dfrac{d^2 y}{dx^2} - 4\dfrac{dy}{dx} + 4y = 8x^2 e^{2x} \sin 2x.$

2.Solve: $D^2 x + Dy + 3x = e^{-t}, D^2 y - 4Dx + 3y = \sin 2t.$

3. Solve: $\dfrac{d^2 y}{dx^2} - y = \dfrac{2}{1 + e^x}$ by the method of variation of parameters

4.Solve series: $2x(1-x)\dfrac{d^2 y}{dx^2} + (1-x)\dfrac{dy}{dx} + 3y = 0.$

5. Solve $x^2 y'' + xy' - y = x^2 e^x$, by variation of parameter

6.Show that $y_1 = e^x$, and $y_2 = e^{-x}$ are linearly independent.

7. Express $x^4 + 3x^3 - x^2 + 5x = 2$, in terms of legendre's polynomial.

8. Prove that $P_n(-x) = (-1)^n P_n(x)$, deduce that $P_n(-1) = (-1)^n$

9. Show that $\dfrac{d}{dx}\left[xj_n J_{n+1}\right] = x[J_n^2 - J_{n+1}^2]$

10. Find the series solution of the differential equation $x\dfrac{d^2 y}{dx^2} + \dfrac{dy}{dx} + xy = 0.$