University of Central Punjab – FOIT&CS

Assignment 3 - DE **Marks: 20**

Due Date:8th January 2024

Q.1. [Marks: 4]
Consider the given set of solutions of some differential equation in the interval $(-\infty, \infty)$. Write the general solution.

$$y_1 = 1 \ , \quad y_2 = \cos(x) \ , \quad y_3 = \sin(x)$$

Q.2. [Marks: 4]
Can you find a homogeneous linear differential equation with constant coefficients whose general solution is given?

$$y = c_1 e^{-x} + c_2 e^{\frac{5}{2}x}$$

Q.3. [Marks: 2]
If the auxiliary equation of differential equation with constant coefficients has roots $0, -1, 1, \pm i, -5 \pm 3i, 6$, write the general solution.

Q.4. [Marks:5]
Find the solution of

$$y'' + 4y' + 4y = (3 + x)e^{-2x}, y(0) = 2\ y'(0) = 5$$

Q.5. [Marks:5]
Find the solution of

$$y'' + 2y' + y = \sin x + 3\cos 2x$$