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MATRIC NO: 15/ENCO1/012

DEPT: CHEMICAL ENGINEERING

ENGI 381 ASSIGNMENT

$$1 - \frac{d^2y}{dx^2} - \frac{dy}{dx} - 2y = 8 \dots (1)$$

In auxiliary form;

$$m^2 - m - 2 = 0$$

$$m^2 - m - 2m - 2 = 0$$

$$m(m+1) - 2(m+1) = 0$$

$$(m+1)(m-2) = 0$$

$$m_1 = -1 \quad m_2 = 2$$

$$y = Ae^{m_1x} + Be^{m_2x}$$

$$y = Ae^{-x} + Be^{2x} \quad (C.F)$$

P.I ; $y = c$

$$\frac{dy}{dx} = 0$$

$$\frac{d^2y}{dx^2} = 0$$

Putting the values of y , $\frac{dy}{dx}$ & $\frac{d^2y}{dx^2}$ in eq (1)

$$0 - 0 - 2c = 8$$

$$-2c = 8$$

$$c = -4$$

$$y = 4$$

$$G.S = C.F + P.I$$

$$= Ae^{-x} + Be^{2x} - 4$$

$$2. \frac{d^2y}{dx^2} - 4y = 10e^{3x}$$

$$\frac{d^2y}{dx^2} = 4y$$

In auxiliary form;

$$m^2 = 4$$

$$m = \pm\sqrt{4} \quad ; \quad m = \pm 2$$

$$C.F; y = C \cosh nx + D \sinh nx$$

$$= C \cosh 2x + D \sinh 2x$$

P.I $y = Ce^{3x}$

$$\frac{dy}{dx} = 3Ce^{3x}$$

$$\frac{d^2y}{dx^2} = 9Ce^{3x}$$