Section

Ques 2 P.I of

$$\frac{d^2y}{dx^2} - y = x^2$$

$$D^2 - y = x^2$$

Auxillary equation :→ $m^2 - 1 = 0$

$$m = +1, -1$$

$$m_1 = +1, \quad m_2 = -1$$

$$\boxed{C.F = C_1 e^x + C_2 e^{-x}}$$

$$P.I. = \frac{1}{f(D)} x^n = [f(D)]^{-1} x^n$$

$$\Rightarrow \frac{1}{D^2 - 1}(x^2) = [D^2 - 1]^{-1} x^2$$

$$= -1[1 + D^2]^{-1} x$$

$$= [1 - D^2 + (D^2)^2 + \dots] x^2$$

$$= [1 - D^2 + D^4 \dots] x^2$$

$$= x^2 - D^2[x^2] \quad \text{(neglecting higher terms)}$$

$$= x^2 - 2$$

$$\boxed{P.I = x^2 - 2}$$