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Matric No: 15/engr1/002 Assignment 2
Department: Chemical Engineering

$$EI\frac{d^2y}{dx^2} = \frac{w}{2}(L-x)^2$$

$$EIm^2 = 0$$

$$m^2 = 0$$

$$m = \pm\sqrt{0} \quad m = \pm\sqrt{0} \quad y = e^{0x}[A + Bx]$$

$$y = A + Bx$$

$$y_p = y = Fx^2 + Gx^3 + Hx^4$$

$$dy/dx = 2Fx + 3Gx^2 + 4Hx^3$$

$$\frac{d^2y}{dx^2} = 2F + 6Gx + 12Hx^2$$

$$EI[2F + 6Gx + 12Hx^2] = \frac{w}{2}(L-x)^2$$

$$2FEI + 6GEIx + 12HEIx^3 = \frac{w}{2}(L^2 - 2Lx + x^2)$$

$$2HEI = w$$

$$H = \frac{w}{2HEI}$$

$$12GEI = -2wL$$

$$G = \frac{-2wL}{12EI} = \frac{-wL}{6EI} \quad \text{——— (3)}$$

$$4FEI = -2wL$$

$$G = \frac{-2wL}{12EI} = \frac{-wL}{6EI} \quad \text{——— (2)}$$

$$4FEI = wL^2$$

$$F = \frac{wL^2}{4EI}$$

$$y = \left[\frac{wL^2}{4EI}\right]x^2 - \left[\frac{wL}{6EI}\right]x^3 + \left[\frac{w}{24EI}\right]x^4$$

$$= \frac{wL^2x^2}{4EI} - \frac{wx^3}{6EI} + \frac{wx^4}{24EI}$$

$$= \frac{6wl^2x^2 - 4wlx^3 + wx^4}{24EI}$$

G-E : $y = A + Bx + \frac{w}{24EI}\left[6L^2x^2 - 4Lx^3 + x^4\right]$

at $y = 0$, $x = 0$ $dy/dx = 0$

$$0 = A + B(0) + \frac{w}{24EI}\left[6L^2(0) - 4L(0) + 0\right]$$

$A = 0$

$$\frac{dy}{dx} = B + \frac{w}{24EI}\left[12L^2x - 12Lx^2 + 4x^3\right]$$

$$0 = B + \frac{w}{24EI}\left[12(0) - 12(0) + 4(0)\right]$$

$B = 0$

$$y_p = \frac{w}{24EI}\left[6L^2x^2 - 4Lx^3 + x^4\right]$$

$$y_p = \frac{wx^2}{24EI}\left[6L^2 - 4Lx + x^2\right]$$

$$y_p = \frac{wx^2}{24EI}\left[x^2 - 4Lx + 6L^2\right]$$

when $x = L$

$$y_p = \frac{wl^2}{24EI}\left[l^2 - 4L^2 + 6L^2\right]$$

$$y_p = \frac{wl^2}{24EI}\left[3L^2\right]$$

$$y = \frac{wL^4}{8EI}$$