$$12+4EI = -2WL$$

$$+\!+ = -\frac{2WL}{12EI}$$

$$+\!+ = -\frac{WL}{6EI}$$

$$4+4EI = WL^2$$

$$+ = \frac{WL^2}{4+4EI}$$

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

$$y = \frac{WL^2x^2}{4EI} - \frac{WLx^3}{6EI} + \frac{Wx^4}{24EI}$$

$$y = \frac{6WL^2x^2 - 4WLx^3 + Wx^4}{24EI}$$

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

Q.5

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

$$x+y = 0,\ x = 0 \quad \frac{dy}{dx} = 0$$

$$A = 0$$

$$\frac{dy}{dx} = B + \frac{W}{24EI}\left(12L^2x - 12Lx^2 + 4x^3\right)$$

$$0 = B + \frac{W}{24EI}\left(12L^3(0) - 12L(0)^2 + 4(0)^3\right)$$

$$B = 0$$

THOMAS, GODWIN EKERETTE
14/ENG04/033
400LEVEL
ELECT/ELECT ENGR
ENG 381

ASSIGNMENT (ANSWERS)

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

Solution

C.F $\quad EIm^2 = 0$

$m^2 = 0$

$m = \sqrt{0}$

$m = 0$

$y = e^{0\cdot x}(A + Bx)$

$y = A + Bx$

P.I $\quad y = Ax^2 + Bx^3 + Cx^4$

$\frac{dy}{dx} = 2Ax + 3Bx^2 + 4Cx^3$

$\frac{d^2y}{dx^2} = 2A + 6Bx + 12Cx^2$

$EI(2A + 6Bx + 12Cx^2) = \frac{w}{2}(l-x)^2$

$2AEI + 6BxEI + 12Cx^2EI = \frac{w}{2}(l^2 - 2lx + x^2)$

$4AEI + 12BxEI + 24Cx^2EI = w(l^2 - 2lx + x^2)$

Comparing coefficients

$24IEI = w$

where $I = \frac{w}{24EI}$

P.S

$$y = \frac{W}{24EI}\left(6L^2x^2 - 4Lx^3 + x^4\right)$$

$$y = \frac{W}{24EI}\,x^2\left(6L^2 - 4Lx + 6x^2\right)$$

$x = L$

$$y = \frac{WL^3}{24EI}\left(6L^2 - 4L^2 + L^2\right)$$

$$y = \frac{WL^2}{24EI}\left(3L^2\right)$$

$$y = \frac{3WL^4}{24EI}$$