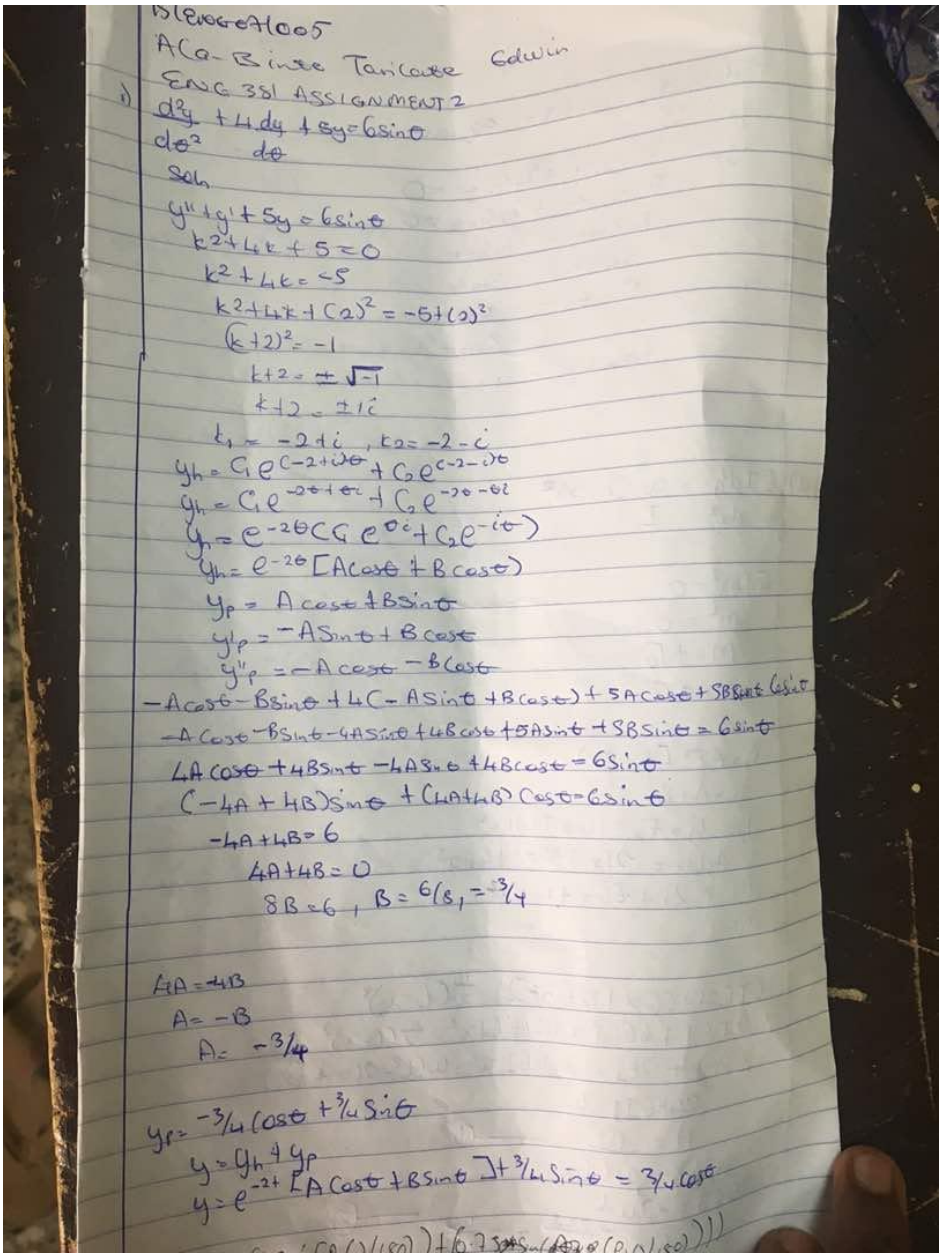
NAME: ALA-BINTE TARILATE EDWIN
MAT NO: 15/ENG07/005



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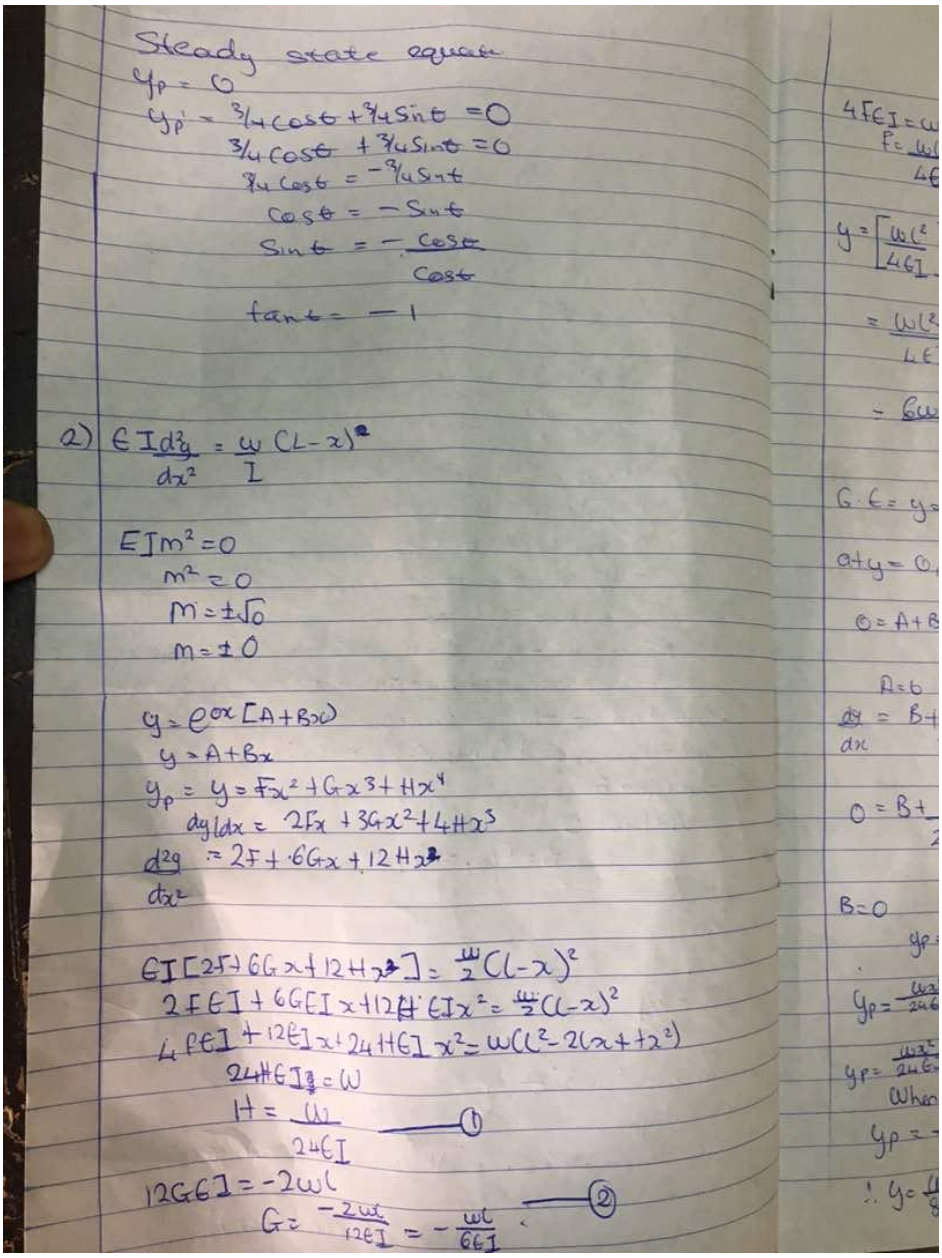

Steady state equation

$y_p = 0$

$y_p' = \frac{3}{4}\cos t + \frac{3}{4}\sin t = 0$

$\frac{3}{4}\cos t + \frac{3}{4}\sin t = 0$

$\frac{3}{4}\cos t = -\frac{3}{4}\sin t$

$\cos t = -\sin t$

$\sin t = -\frac{\cos t}{\cos t}$

$\tan t = -1$

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

$EIm^2 = 0$

$m^2 = 0$

$m = \pm\sqrt{0}$

$m = \pm 0$

$y = e^{ax}[A + Bx]$

$y = A + Bx$

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

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

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

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

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

$4FEI + 12EIx + 24HEIx^2 = w(L^2 - 2Lx + x^2)$

$24HEI\frac{x^2}{2} = w$

$H = \frac{w}{24EI}$ ——— ①

$12GEI = -2wL$

$G = \frac{-2wL}{12EI} = -\frac{wL}{6EI}$ ——— ②

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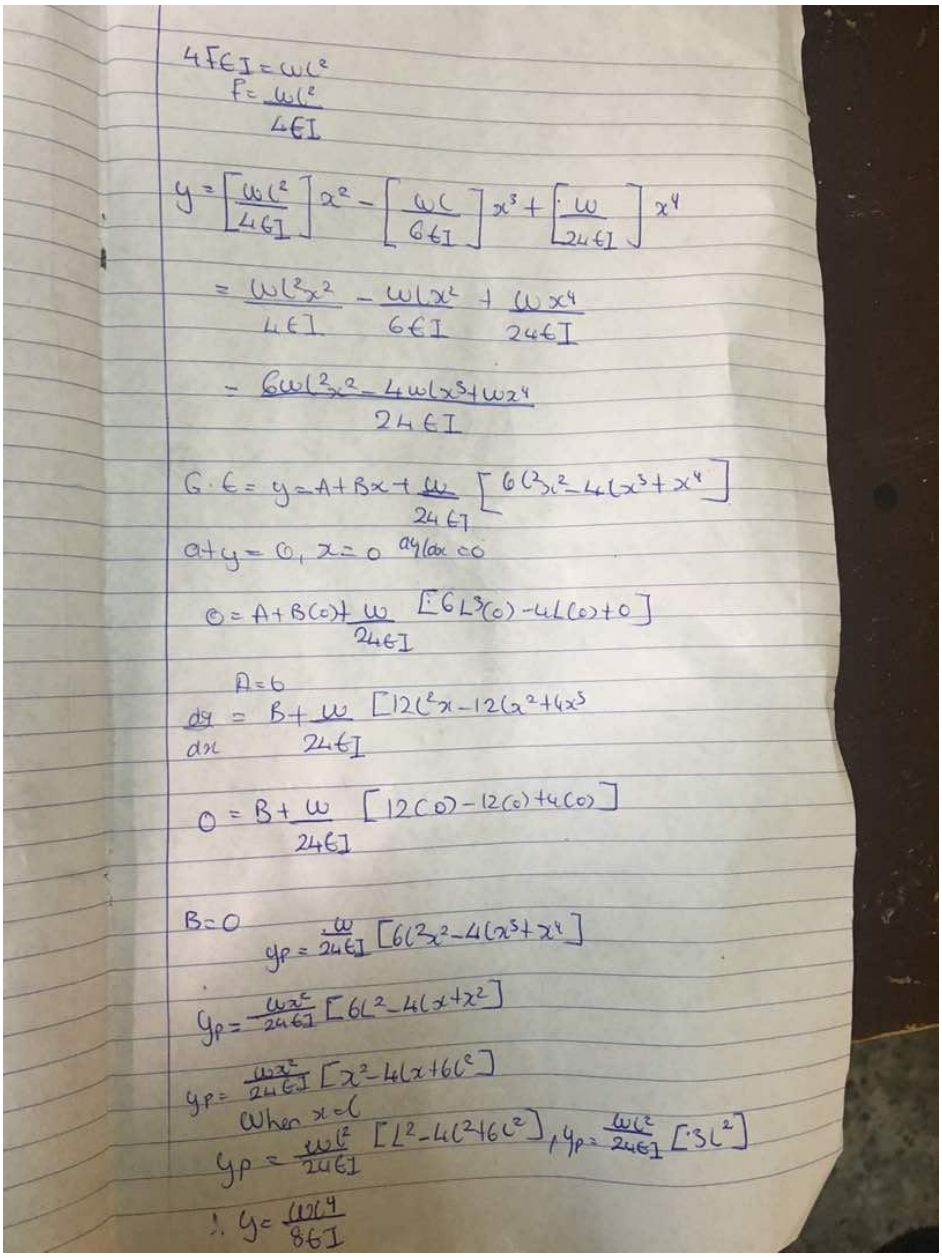

$$4FEI = wL^2$$
$$F = \frac{wL^2}{4EI}$$

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

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

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

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

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

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

$$A = 0$$

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

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

$$B = 0$$

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

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

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

When $x = L$

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

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