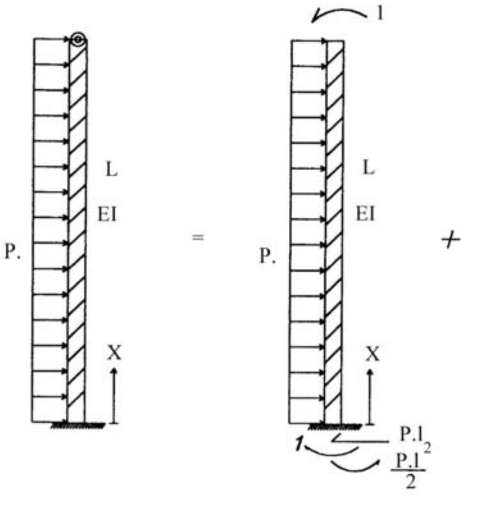
[illegible]

[illegible]



[illegible]

[illegible]

$$M = P_oLX - \frac{P_oL^2}{3} - \frac{P_oX^2}{2} \qquad (7)$$

$$\frac{d^2y}{dx^2} = \frac{1}{EI}\left(P_oLX - \frac{P_oL^2}{3} - \frac{P_oX^2}{2}\right) \qquad (8)$$

$$\frac{dy}{dx} = \frac{1}{EI}\left(\frac{P_oLX^2}{2} - \frac{P_oL^2X}{3} - \frac{P_oX^3}{6} + C_1\right) \qquad (9)$$

$$y = \frac{1}{EI}\left(\frac{P_oLX^3}{6} - \frac{P_oL^2X^2}{6} - \frac{P_oX^4}{24} + C_1X + C_2\right) \qquad (10)$$

[illegible]

$$\text{at } X = 0 \quad \Rightarrow \quad y = \frac{dy}{dx} = 0 \qquad (11)$$

[illegible]

[illegible]

3-1- [illegible]

[illegible]

$$0 < x < L \Rightarrow \bar{m} = 1, M = P_oLx - \frac{P_oL^2}{2} - \frac{P_ox^2}{2} \qquad (1)$$

$$\bar{1}*\theta_{ob} = \int_0^L \frac{\bar{m}M}{EI}dx = \frac{1}{EI}\int_0^L\left(P_oLX - \frac{P_oL^2}{2} - \frac{P_ox^2}{2}\right)dx = \frac{-P_oL^3}{6EI} \qquad (2)$$

$$\bar{1}*\theta_{bb} = \int_0^L \frac{\bar{m}M}{EI}dx = \frac{1}{EI}\int_0^L dx = \frac{1}{EI} \qquad (3)$$

[illegible]

$$\theta_{ob} + M_B\theta_{bb} = \frac{M_B}{K_\theta} \qquad (4)$$

[illegible] K_θ [illegible]

$$\theta_{ob} + M_B\theta_{bb} = 0 \qquad (5)$$

$$\frac{P_oL^3}{6EI} = M_B\frac{L}{EI} \rightarrow M_B = \frac{P_oL^2}{6} \qquad (6)$$

[illegible]

$$C_1 = C_2 = 0 \quad (12)$$

[illegible]

[illegible]

$$\varphi_{(x)} = \frac{P_o L X^3}{6} - \frac{P_o L^2 X^2}{6} - \frac{P_o X^4}{24} \quad (13)$$

$$\varphi'_{(x)} = \frac{P_o L X^2}{2} - \frac{P_o L^2 X}{3} - \frac{P_o X^3}{6} \quad (14)$$

$$\varphi''_{(x)} = P_o L X - \frac{P_o L^2}{3} - \frac{P_o X^2}{2} \quad (15)$$

[illegible]

[illegible]

[illegible]

[illegible]

$$K^* = \int_0^L EI(\varphi''(x))^2 dx + k_\theta \left(\varphi'_{(i)}\right)^2 \quad (16)$$

$$\varphi'_{(i)} = \varphi'(x=1) = \frac{P_o L^3}{2} - \frac{P_o L^3}{3} - \frac{P_o L^3}{6} = 0 \quad (17)$$

$$\int_0^L \left(\varphi''_{(x)}\right)^2 dx = \int_0^L \left(P_o L X - \frac{P_o L^2}{3} - \frac{P_o X^2}{2}\right)^2 dx = 0.0222 P_o^2 L^5 \quad (18)$$

[illegible]

[illegible]

$$K^* = 0.0222\ EI\ P_o^2\ L^5 \quad (19)$$

[illegible]

[illegible]

$$m^* = \int_0^L \bar{m}\left(\varphi_{(x)}\right)^2 dx = \bar{m}\int_0^L \left(\frac{P_o L X^3}{6} - \frac{P_o L^2 X^2}{6} - \frac{P_o X^4}{24}\right)^2 dx \quad (20)$$

$$m^* = 0.000705\, \bar{m}\, P_o^2 L^9 \quad (21)$$

[illegible]

$$C^* = \int_0^L \bar{c}\left(\varphi_{(x)}\right)^2 dx = 0.000705\, \bar{c}\, P_o^2 L^9 \quad (22)$$

[illegible]

[illegible]

$$P^* = \int_0^L P(x,t)\varphi_{(x)} dx = \int_0^L P_o \left(\frac{P_o L X^3}{6} - \frac{P_o L^2 X^2}{6} - \frac{P_o X^4}{24}\right) dx \quad (23)$$

$$P^* = -0.0222\ P_o^2 L^5 \quad (24)$$

[illegible]

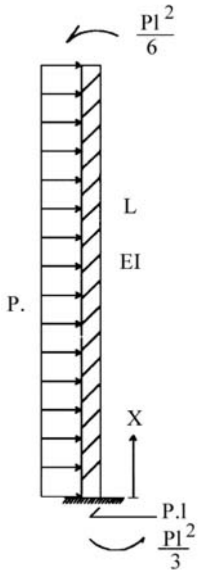
[illegible]

$$m^* X + C^* X + K^* X = P^* \quad (25)$$

[illegible]

[illegible]

$$0.000705\, \bar{m}\, P_o^2 L^9 X + 0.000705\, \bar{c}\, P_o^2 L^9 X + 0.0222 EI\, P_o^2 L^5 X = -0.0222\, P_o^2 L^5 \quad (26)$$



[illegible]

3-2- [illegible]

[illegible]

[illegible]

(27)

$$0<X<\frac{L}{2}\Rightarrow \bar{m}=1, M=P_oLX-\frac{P_oL^2}{2}-\frac{P_oX^2}{2}$$

[illegible] $\bar{m}=0$ [illegible] $\frac{L}{2}$ [illegible]:

(28)

$$1*\theta_{ob}=\int_0^{\frac{L}{2}}\left(P_oLX-\frac{P_oL^2}{2}-\frac{P_oX^2}{2}\right)dx=\frac{-7P_oL^3}{48}$$

(29)

$$1*\theta_{ob}=\int_0^{\frac{L}{2}}dx=\frac{L}{2}$$

[illegible] (30) [illegible]:

(30)

$$\theta_{ob}+M_B\theta_{bb}=\frac{M_B}{K_\theta}$$

[illegible] (30) [illegible] K_θ [illegible]:

(31)

$$\frac{7P_oL^3}{48}=M_B\frac{1}{2}\Rightarrow M_B=\frac{14P_oL^2}{48}$$

[illegible] (31) [illegible] M_B [illegible] (3) [illegible] (4) [illegible] [3]:

(32)

$$y_1''(x)=\frac{1}{EI}\left(P_oLX-\frac{10P_oL^2}{48}-\frac{P_oX^2}{2}\right)$$

(33)

$$0<X<\frac{L}{2}\Rightarrow y_1'(x)=\frac{1}{EI}\left(\frac{P_oLX^2}{2}-\frac{10P_oL^2X}{48}-\frac{P_oX^3}{6}+C_1\right)$$

(34)

$$y_1(x)=\frac{1}{EI}\left(\frac{P_oLX^3}{6}-\frac{5P_oL^2X^2}{48}-\frac{P_oX^4}{24}+C_1X+C_2\right)$$

(35)

$$y_2''(x)=\frac{1}{EI}\left(P_oLX-\frac{P_oL^2}{2}-\frac{P_oX^2}{2}\right)$$

(36)

$$\frac{L}{2}<X<L\Rightarrow y_2'(x)=\frac{1}{EI}\left(\frac{P_oLX^2}{2}-\frac{P_oL^2X}{2}-\frac{P_oX^3}{6}+C_3\right)$$

(37)

$$y_2(x)=\frac{1}{EI}\left(\frac{P_oLX^3}{6}-\frac{P_oL^2X^2}{4}-\frac{P_oX^4}{24}+C_1X+C_2\right)$$

[illegible] x=0 [illegible] (33) [illegible] (34):

(38)

$$C_1=C_2=0$$

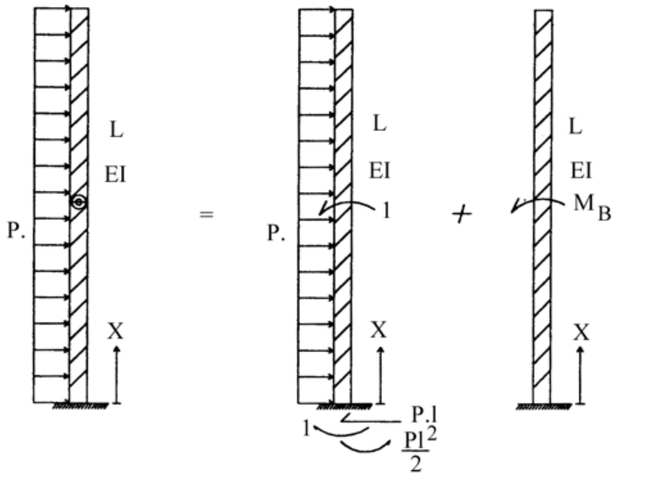
[illegible] $X=\frac{L}{2}$ [illegible]:

(39)

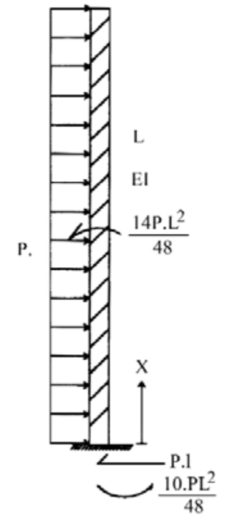
$$\text{at } X=\frac{L}{2}\Rightarrow y_1'(x)=y_2'(x)\Rightarrow C_3=\frac{7P_oL^3}{48}$$

(40)

$$\text{at } X=\frac{L}{2}\Rightarrow y_1(x)=y_2(x)\Rightarrow C_4=\frac{-7P_oL^4}{12(16)}$$



[illegible] (3) [illegible]



[illegible] (4) [illegible]

[illegible] (39) [illegible] (40) [illegible] (36) [illegible] (37) [illegible]

[illegible]:

$$k^* = \int_0^{\frac{L}{2}} EI\,(\varphi''1(x))^2\,dx + \int_{\frac{L}{2}}^{L} EI(\varphi'2(x))^2\,dx + k_\theta(\varphi_i')^2 \qquad (41)$$

$$\varphi_i' = \varphi'\left(x = \frac{L}{2}\right) = \frac{P_oL^3}{8} - \frac{5P_oL^3}{48} = 0 \qquad (42)$$

$$\int_0^{\frac{L}{2}} (\varphi_1''(x))^2\,dx = \int_0^{\frac{L}{2}}\left(P.LX - \frac{10P_oL^2}{48} - \frac{P_oX^2}{2}\right)^2 dx = \frac{6.75P_o^2L^5}{48\,(24)} \qquad (43)$$

$$\int_{\frac{L}{2}}^{L} (\varphi_2''(x))^2\,dx = \int_{\frac{L}{2}}^{L}\left(P.LX - \frac{P_oL^2}{2} - \frac{P_oX^2}{2}\right)^2 dx = \frac{P_o^2L^5}{32\,(20)} \qquad (44)$$

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$$k^* = 0.00743\,EI\,P_o^2L^2 \qquad (45)$$

[illegible]

$$m^* = \int_0^{\frac{L}{2}} \overline{m}\,(\varphi_1(x))^2\,dx + \int_{\frac{L}{2}}^{L}\overline{m}(\varphi_2(x))^2\,dx \qquad (46)$$

$$\int_0^{\frac{L}{2}} (\varphi_1(x))^2\,dx = \int_0^{\frac{L}{2}}\left(\frac{P_oLX^3}{6} - \frac{5P_oL^2X^2}{48} - \frac{P_oX^4}{24}\right)^2 = 0.0000117P_o^2L^9 \qquad (47)$$

$$\int_{\frac{L}{2}}^{L} (\varphi_2(x))^2\,dx = \int_{\frac{L}{2}}^{L}\left(\frac{P_oLX^3}{6} - \frac{P_oL^2X^2}{4} - \frac{P_oX^4}{24} - \frac{7P_oL^3X}{48} - \frac{7P_oL^4}{12\,(16)}\right)^2 dx \qquad (48)$$

$$= 0.0000628P_o^2L^9$$

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$$m^* = 0.0000\,745\,\overline{m}\,P_o^2L^9 \qquad (49)$$

[illegible]

$$c^* = 0.0000\,745\,\overline{c}\,P_o^2L^9 \qquad (50)$$

[illegible]

$$P^* \int_0^{\frac{L}{2}} P(x,t)\varphi_1(x)dx + \int_{\frac{L}{2}}^{L} P(x,t)\varphi_2(x)dx \qquad (51)$$

$$P = P_o\int_0^{\frac{L}{2}}\left(\frac{P_oLx^3}{6} - \frac{5P_oL^2X^2}{48} - \frac{P_oX^4}{24}\right)dx +$$

$$\int_{\frac{L}{2}}^{L}\left(\frac{P_oLx^3}{6} - \frac{P_oL^2X^2}{4} - \frac{P_oX^4}{24} + \frac{7P_oL^3X}{48} - \frac{7P^oL^4X}{12(16)}dx\right) = \qquad (52)$$

$$-0.007465P.^2L^5$$

[illegible]

$$m^*x + C^*X + K^*x = P^* \qquad (53)$$

ﺕ > ﺕﺎﻧﺎ ﯾ° ﺃ)45(ﻭ)49(ﻭ)50(ﻭ)52(ﻓﻲ)53(:

$$(54)$$

$$0.0000\,745\,\overline{m}\,P_o^2L^9X + 0.0000745\,\overline{C}\,P_o^2L^9X + 0.00743\,EI\,P_o^2L^5$$

$$X = -0.00746\,P_o^2L^5$$

4- [illegible]

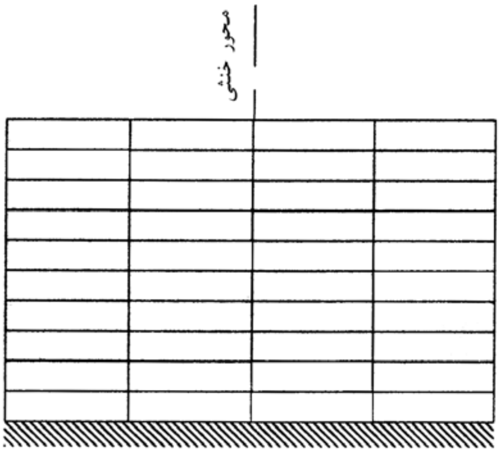
[illegible]

4-1- [illegible]

[illegible] 0.6 ×0.6 [illegible] 24 [illegible] (20/72) [illegible] 2400 [illegible] 650 [illegible]

$$\overline{m} = 0.6\,(0.6)5\,(2400) + 24\,(650)5\left(\frac{20}{72}\right) = 26000\ \text{kg/m} \qquad (55)$$

[illegible])55([illegible] 2400 [illegible] [14].



[illegible]

[illegible]

$$I = \sum Ad^2 = 0.6\,(0.6)\left(2*5^2 + 2*10^2\right) = 90m^4 \quad (65)$$

[illegible] $2.1E10\frac{N}{m^2}$ [illegible]

$$\bar{C} = \alpha\bar{m} = 2\xi W_N \bar{m} 2\xi \bar{m}\sqrt{\frac{3EI}{ml^3}} \quad (75)$$

$$\bar{C} = 2(0.05)26000\sqrt{\frac{3(2.1E10)90}{72\,(26000)72^3}} = 7406.5 \text{ kg/m} \quad (85)$$

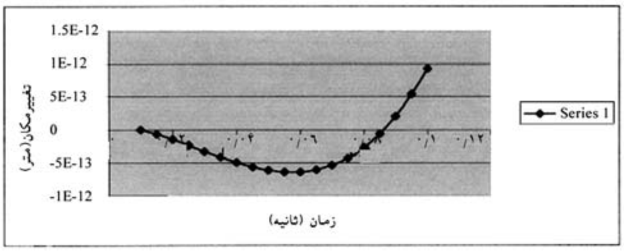
[illegible]

[illegible]

$$\ddot{X} + 0.28487\dot{X} + 85.26141X = -4.511186E\text{-}11\left(9t^2 - 0.55t\right) \quad (95)$$

[illegible] $9t^2 - 0.55t$ [illegible]

[illegible]



[illegible]

10\0	120\0	530\0	730\0	60\0	300\0	580\0	280\0-
510\0	820\0	40\0	430\0	560\0	-10\0	90\0	60\10-
20\0	330\0	54\0	920\0	70\0	520\0-	590\0	131\0-
520\0	730\0	50\0	320\0	570\0	240\0-	1\0	851\0-
30\0	830\0	550\0	410\0	80\0	60\0-		

[illegible]

$$\ddot{X} + 0.28487\dot{X} + 269.77X = -1.4341E\text{-}10\left(9t^2 - 0.55t\right) \quad (06)$$

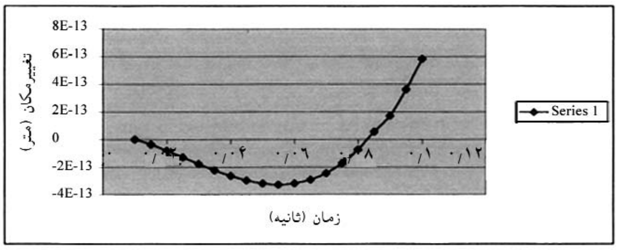
[illegible]

10\0	6\6	530\0	8\11	60\0	68\0	580\0	12\62-
510\0	39\8	40\0	90\01	560\0	62\3-	90\0	65\32-
20\0	16\01	54\0	63\9	70\0	30\8-	590\0	55\14-
520\0	56\11	50\0	71\7	570\0	44\31-	1\0	91\05-
30\0	50\21	550\0	43\4	80\0	5\91-		

[illegible]

4-2- [illegible]

[illegible]



[illegible]

[illegible]

$$\bar{m} = 0.7(0.7)5(2400)+30(650)5\frac{20}{90} = 27550\ kg/m \qquad (16)$$

[illegible]

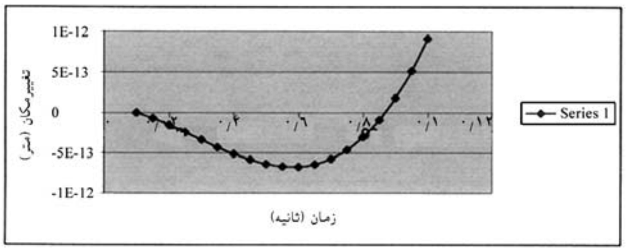
$$I=\sum Ad^2 = 0.7(0.7)(2*5^2+2*10^2)=122.5m^4 \qquad (26)$$

[illegible] $2.1E10\frac{N}{m^2}$ [illegible]

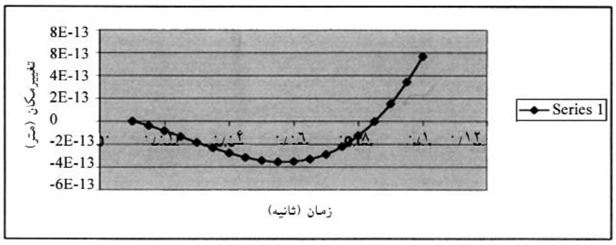
$$\bar{C}=\alpha\bar{m}=2\xi W_N \bar{m}=2\xi\bar{m}\sqrt{\frac{3EI}{ml^3}} \qquad (36)$$

$$\bar{C}=2(0.05)27550\sqrt{\frac{3(2.1E10)122.5}{90(27550)90^3}}=5700\ kg/m \qquad (46)$$

[illegible]



[illegible]



[illegible]

5- [illegible]

[illegible]

6- [illegible]

1- [illegible] 1373.

2- [illegible] 1369.

3- [illegible] 1369.

4- [illegible] 1381.

5- [illegible] 1373.