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ID: 13639

Subject: Intro-Earthquake

Assignment: 03

Submitted to: Engineer – Khurshid Alam

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Check by:

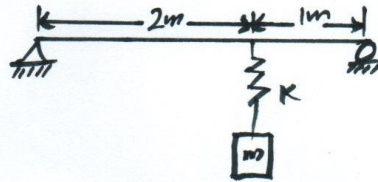
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ID # = 13639 - to = Engr-
Subj = Intro-Earthquake = Khushid
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Determine the Equivalent stiffness
of system.



Given Data
= =

$$E = 210 \times 10^9 \text{ N/m}^2$$

$$I = 5 \times 10^{-4} \text{ m}^4$$

$$K = 1 \times 10^8 \text{ N/m}$$

- * - *

$$L = 3 \text{ m}$$

$$a = 2 \text{ m}$$

$$b = 1 \text{ m}$$

(2)

Solution:

According to support of the system
one pinned and other are rollers.

$$\therefore K_2 = \frac{3EI}{a^2 b^2}$$

$$\therefore K_{eq} = \frac{K_1 K_2}{K_1 + K_2}$$

$$K_2 = \frac{3 \times (210 \times 10^9) \times (5 \times 10^{-4}) \times 3}{(2)^2 \times (1)^2}$$

$$= \frac{945,000,000}{4}$$

$$K_2 = 236,250,000 \text{ N/m}$$

$$K_{eq} = \frac{(1 \times 10^8) \times 236,250,000}{(1 \times 10^8) + 236,250,000}$$

$$K_{eq} = 7.03 \times 10^7 \text{ N/m}$$

Ans