

Name :

Subhan ullah

ID#

14772

Subject :-

theory of structure

# ASSIGNMENT : 1

①



Solution:

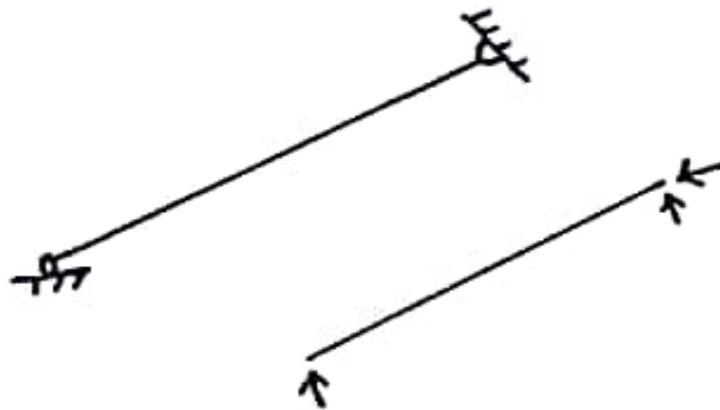
$$R = 3n$$

$$4 = 3(1)$$

$$4 > 3$$

indeterminate by 1°

②



Solution:

$$R = 3n$$

$$3 = 3(1)$$

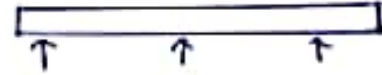
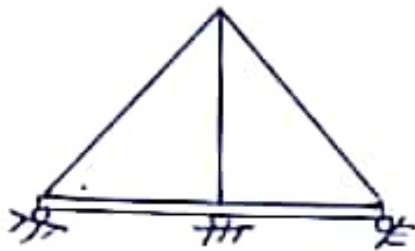
$$3 = 3$$

Determinate structure

# ASSIGNMENT = 02

23

①



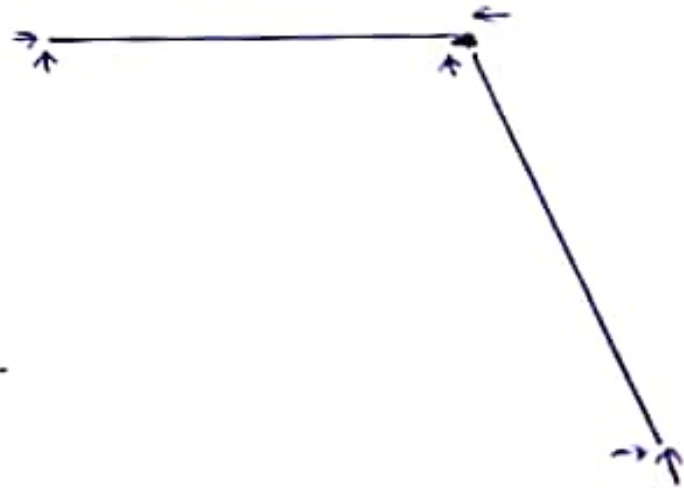
Solution :-

$$R = 3n$$

$$3 = 3(1)$$

$$3 = 3$$

Determinate structure



Solution :-

$$R = 3n$$

$$6 = 3(2)$$

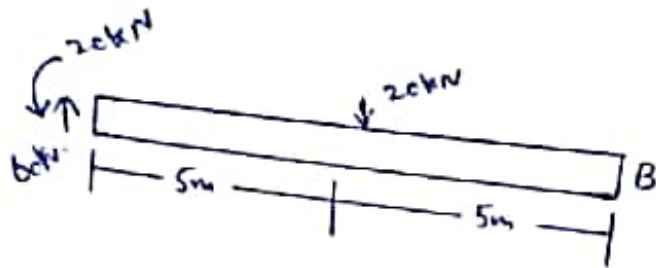
$$6 = 6$$

Determinate structure

# ASSIGNMENT :: 03

③

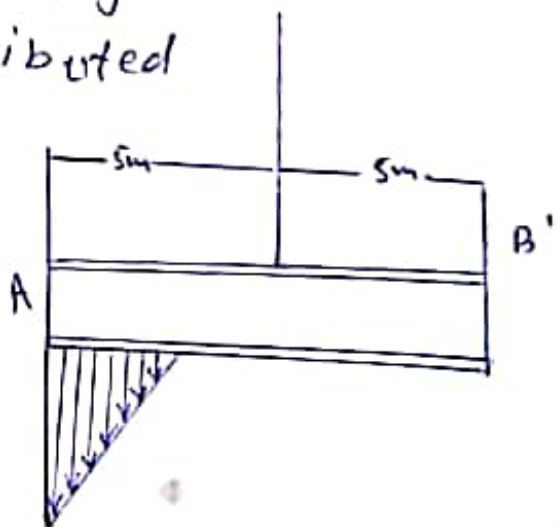
Determine the slope and deflection at Point B of the beam shown in fig 8.24a. the reactions have been computed.  $E = 200 \text{ GPa}$ ,  $I = 475 (10^6) \text{ mm}^4$ .



Solution ::

Conjugate Beam :-

The conjugate beam is A shown in fig. 8-24b. The supports at A and B correspond to I/O supports a and B on the real beam Table B-2. It is important to understand why this is so the  $M/EI$  diagram is negative so the distributed

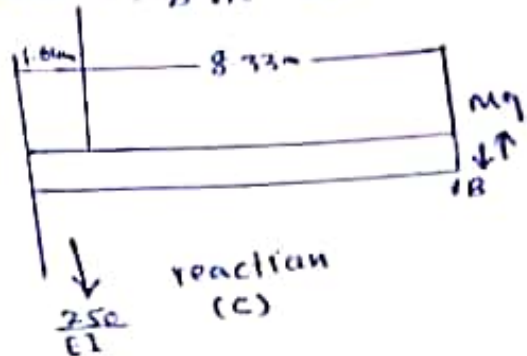


Load acts downwards, i.e. away from the beam

Equilibrium:-

Since  $\theta_B$  and  $\Delta_B$  are to be determined we must compute  $V_B$  and  $M_B$  in the conjugate beam

Fig. 8-24c.



$$\frac{-250 \text{ kN} \cdot \text{m}^2 - V_B = 0}{EI}$$

$$+\uparrow \sum F_y = 0;$$

$$\theta_B = V_B = - \frac{250 \text{ kN} \cdot \text{m}^2}{EI}$$

$$= \frac{-250 \text{ kN} \cdot \text{m}^2}{[200(10^6) \text{ kN/m}^2][475(10^6)(10^{-12}) \text{ m}^4]}$$

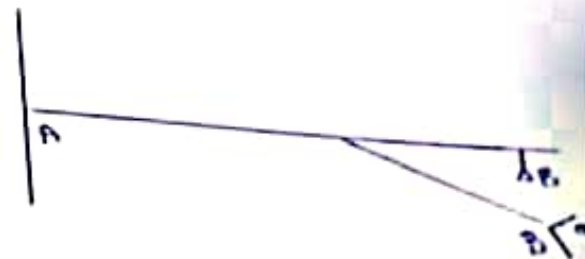
$$= -0.00263 \text{ rad Ans}$$

$$\downarrow + \sum M_B' = 0;$$

$$\frac{250 \text{ kN} \cdot \text{m}^3}{EI}$$

$$\frac{-2083 \text{ kN} \cdot \text{m}^3}{[200(10^6) \text{ (kN/m}^2)][475(10^6)(10^{-12}) \text{ m}^4]}$$

$$= -0.0219 \text{ m} = -21.9 \text{ mm Ans}$$



the negative signs indicate the slope of the beam is measured clockwise and the displacement is down word Fig. 8-24d.