-: NAME :-

SHAH SAUD ROSHAN

-: ID :-

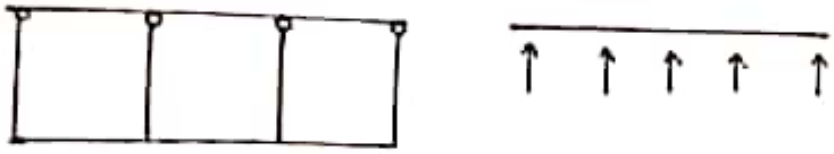
14502

-: SUBJECT :-

THEORY OF STRUCTURE

ASSIGNMENT:-1

①



⇒ -:SOLUTION:-

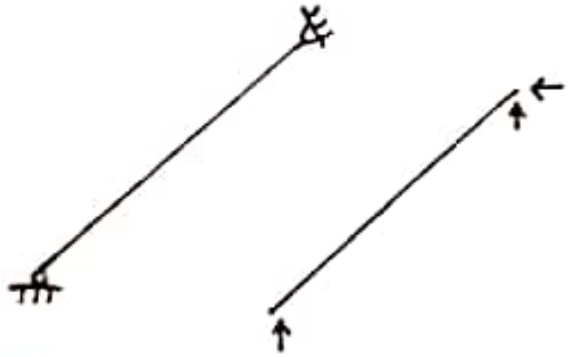
$R = 3n$.

$4 = 3(1)$

$4 > 3$

indeterminate by 1°.

②



⇒ -:SOLUTION:-

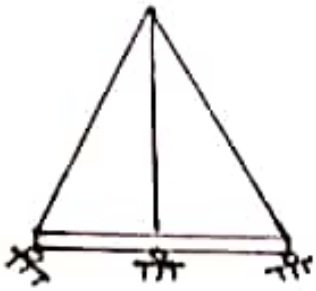
$R = 3n$

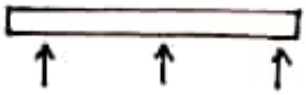
$3 = 3(1)$

$3 = 3$

Determinate Structure.

ASSIGNMENT: 2

① 



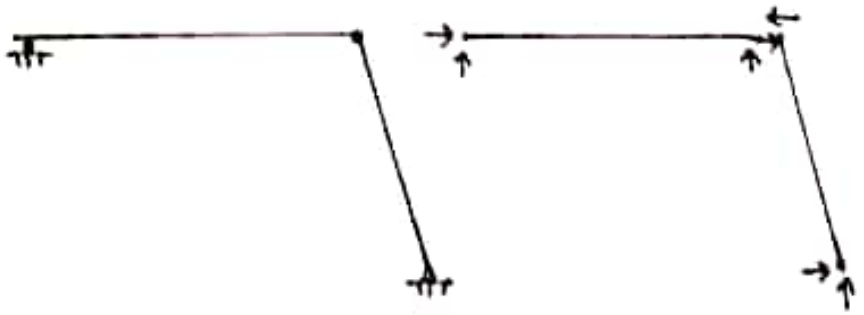
⇒ :-SOLUTION:-

$R = 3n$

$3 = 3(1)$

$3 = 3$

Determinate Structure.

② 

⇒ :-SOLUTION:-

$R = 3n$

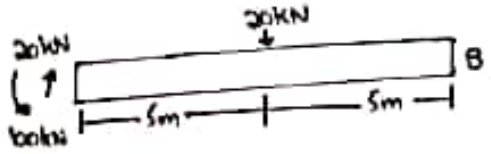
$6 = 3(2)$

$6 = 6$

Determinate Structure.

ASSIGNMENT: 3

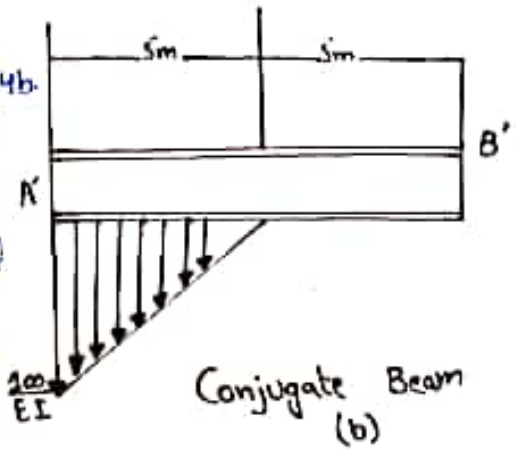
Determine the shape & deflection at point B of the steel beam shown in Fig 8.24a. The reactions have been computed. $E = 200$ GPa, $I = 475(10^6)\ mm^4$.



⇒ -: SOLUTION:-

Conjugate Beam:-

The conjugate Beam is shown in Fig. 8.24b. The supports at A' & B' correspond to supports A & B on the real Beam, Table 8-2. It is important to understand why this is so. The M/EI diagram is negative, so the distributed.



Conjugate Beam
(b)

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

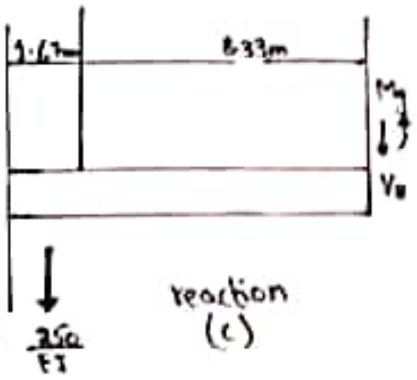
⇒ :- Equilibrium:- Since θ_B & Δ_B are to be determined, we must Compute V_B & M_B in the Conjugate beam, Fig-8-24c.

$$+\uparrow \Sigma F_y = 0; \quad -250\,KN\cdot m^2 - V_B = 0$$

$$\theta_B = V_B = -\frac{250\,KN\cdot m^2}{EI}$$

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

$$= -0.00263\ rad \quad Ans$$



reaction (c)

$$\downarrow + \Sigma M_B' = 0; \quad 250\,KN\cdot m^2\,(8.33m) + M_B' = 0$$

$$\Delta_B = M_B' = -\frac{2083\,KN\cdot m^2}{EI}$$

$$= \frac{-2083\,KN\cdot m^2}{[200(10^6)KN/m^2][475(10^6)(10^{-12})m^4]}$$

$$= -0.0219\,m = -21.9mm \quad Ans.$$

(d)

The negative signs indicate the slope of the beam is measured clockwise & the displacement is downward, Fig-8-24d.