Name:

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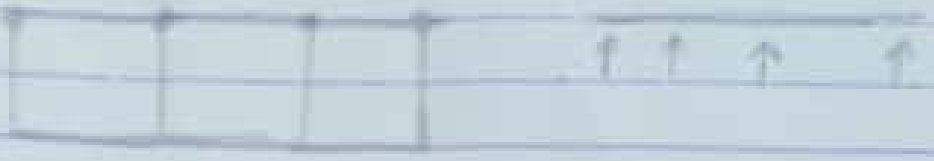
15420

Subject :-

Theory of Structure

Assignment : 1

(1)



Solution:-

$R = 3N$

$4 = 3(1)$

$4 > 3$

Indeterminate by 1°

(2)

Solution :-

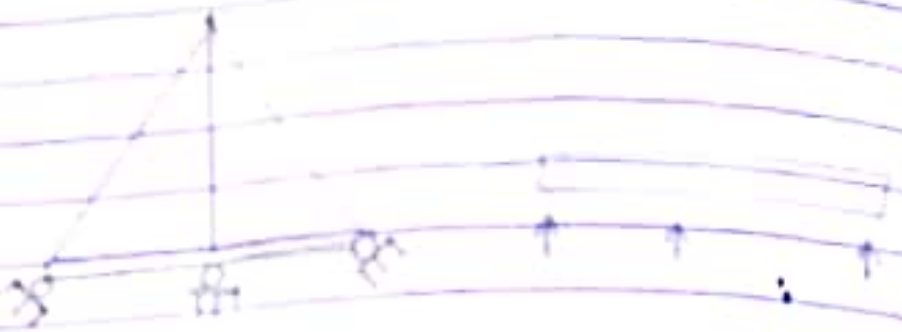
$R = 3n$

$3 = 3(1)$

$3 = 3$

Determinate Structure

Assignment: (2)



Solution:-

$R = 3n$

$3 = 3(1)$

$3 = 3$

Determinate Structure

Solution:-

$R = 3n$

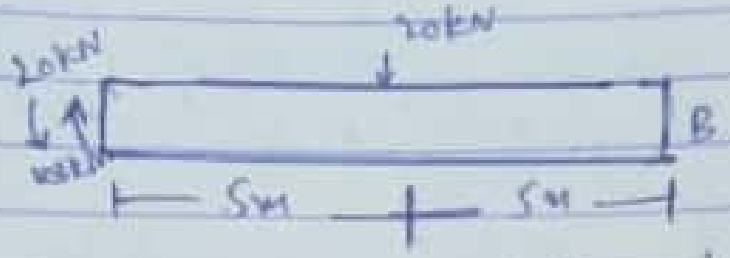
$6 = 3(2)$

$6 = 6$

Determinate Structure

Assignment : (3)

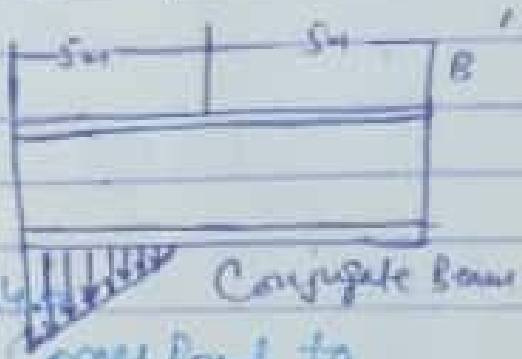
Deter the Slope and deflection at Point B of the Steel beam Shown in Fig 8.24a the reaction have been Computed. $E = 200$ GPa. $I = 475(10^6)$ mm^4



Solution

Conjugate Beam :-

The Conjugat beam is Show in fig 8-24c The Supports at A' and B' Corresponding to Support A and B on the real Beam - Table 8-2. it is important to under Stand why this is so The M/EI diagram is negative. So the distributed load acts downwords. i.e away from the beam.



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

$-250\ kN\cdot m^2 - V_B = 0$

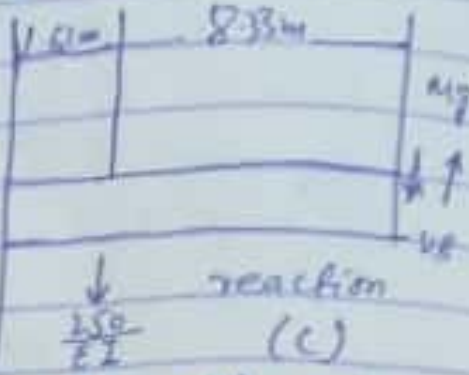
EI

$+\uparrow \Sigma F_y = 0;$

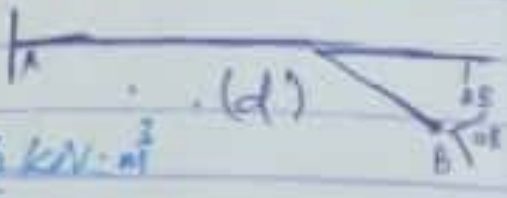
$\theta_B - V_B = -\frac{250\ kN\cdot m^2}{EI}$

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

$= 0.00263\ rad$ Ans



$\zeta + \Sigma M_B' = 0;\quad \frac{250\ kN\cdot m^2}{EI}(8.33\ m) + M_B' = 0$



$\Delta_{B/A} = -\frac{2083\ kN\cdot m^3}{EI}$

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

$= -0.0219\ m = -21.9\ mm$ Ans

The negative sign indicate the slope of the beam is measured clock wise. and the displacement is down, Fig 8-24 d.