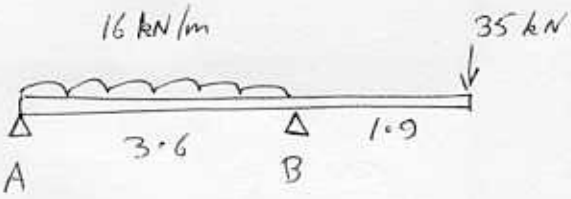
Qu. 5 (d)

Find reactions :



$$\Sigma M_A = \underbrace{(16 \times 3.6)}_{\text{total load}} \times \underbrace{\frac{3.6}{2}}_{\text{dist to centre}} - R_B \times 3.6 + 35(3.6+1.9) = 0$$

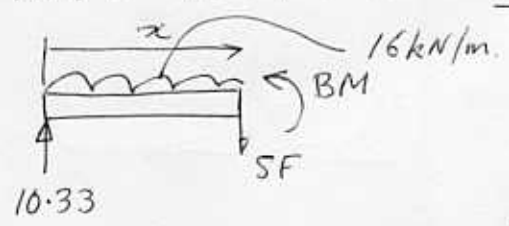
$$\therefore R_B = \frac{16 \times 3.6 \times \frac{3.6}{2} + 35(3.6+1.9)}{3.6}$$

$$R_B = 82.27 \text{ kN}$$

$$\Sigma F_y = R_A - 16 \times 3.6 + R_B - 35 = 0$$

$$\therefore R_A = 16 \times 3.6 - 82.27 + 35 = 10.33 \text{ kN}$$

For the section AB



$$\Sigma F_y = 10.33 - 16 \times x - SF = 0 \quad \therefore SF = 10.33 - 16x$$

$$\Sigma M_{cut} = 10.33 \times x - (16 \times x) \times \left(\frac{x}{2}\right) - BM = 0$$

$$\therefore BM = 10.33x - 8x^2$$

For the section BC (working from the RH end)

$$\Sigma F_y = SF - 35 = 0 \quad \therefore SF = 35 \text{ kN}$$

$$\Sigma M_{cut} = BM + 35x = 0 \quad \therefore BM = -35x$$