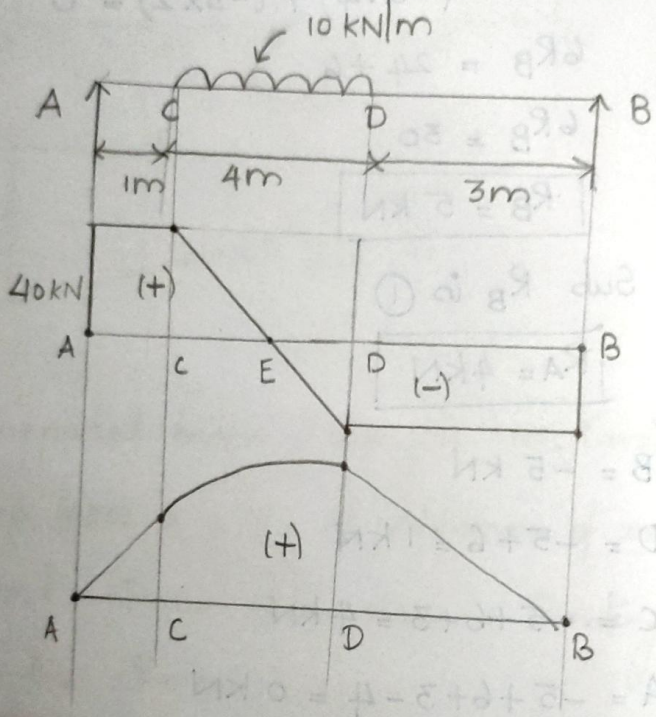
6) Draw the shear force & BM diagrams for a simply supported Beam of Length 8m & carrying a UDL of 10 KN/m for a distance of 4m as shown in fig.



$R_A + R_B = 40$ kN → (1)

$\Sigma M_A = 0$

$(R_B \times 8) + (-40 \times 3) = 0$

$8R_B = 120$

$R_B = \frac{120}{8} = 15$ kN

$R_B = 15$ kN

$R_A = 25$ kN

SF @ B = -15 kN

SF @ D = -15 kN

SF @ C = -15 + 40 = 25 kN

SF @ A = -15 + 40 - 25 = 0 kN

BM @ B = 0 kNm

BM @ D = 15 X 3 = 45 kNm

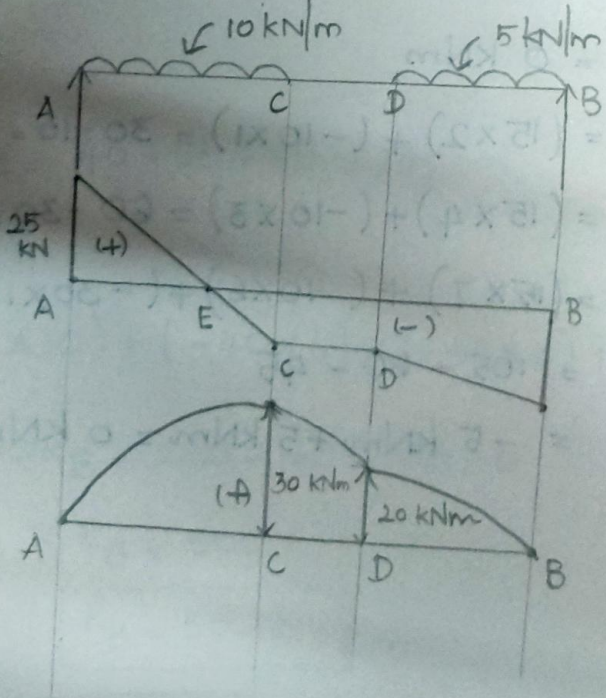
BM @ C = (15 X 7) + (-40 X 2)

= 105 - 80 = 25 kNm.

BM @ A = (15 X 8) + (-40 X 3)

= 120 - 120 = 0 kNm.

7) Draw the SF & BM Diagrams of Simply Supported Beam of Length 7m Carrying UDL as shown in fig.



$R_A + R_B = 30 + 10 = 40$

$R_A + R_B = 40 \rightarrow (1)$

$\Sigma M_A = 0$

$(R_B \times 7) + (-10 \times 6) + (-30 \times 1.5) = 0$

$7R_B - 60 - 45 = 0$

$7R_B = 105$

$\boxed{R_B = 15 \text{ kN}}$

$\boxed{R_A = 25 \text{ kN}}$

SF @ B = −15 kN

SF @ D = −15 + 10 = −5 kN

SF @ C = −5 kN

SF @ A = −15 + 10 + 30 − 25 = 0 kN

BM @ B = 0 kNm

BM @ D = (15 × 2) + (−10 × 1) = 30 − 10 = 20 kNm

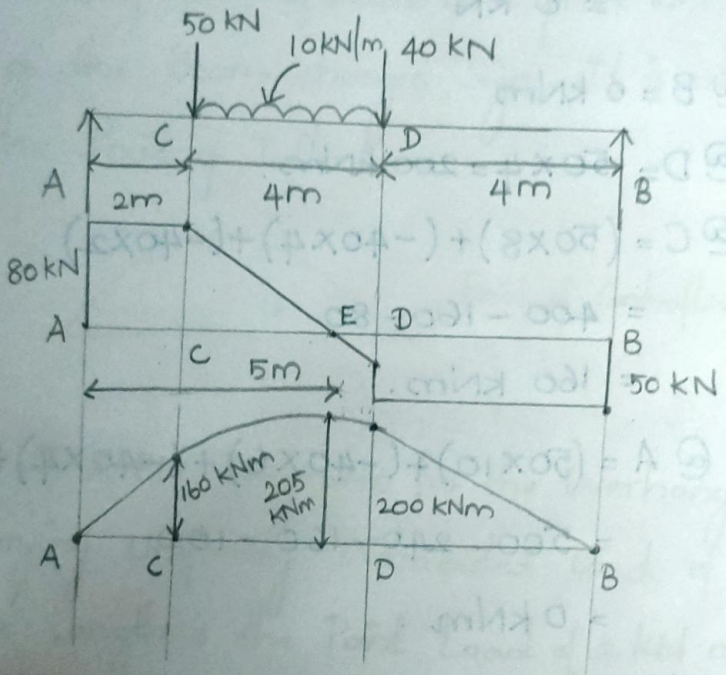
BM @ C = (15 × 4) + (−10 × 3) = 60 − 30 = 30 kNm

BM @ A = (15 × 7) + (−10 × 6) + (−30 × 1.5)

= 105 − 60 − 45

= −5 kNm + 5 kNm = 0 kNm

8) A Simply Supported Beam of Length 10m, Carries the UDL & Two point Loads as shown in fig. Draw the SF & BM Diagram for the Beam. Also Calculate the Maximum Bending Moment?



$R_A + R_B = 40 + 50 + 40 = 130$ kN

$\Sigma M_A = 0$

$(R_B \times 10) + (-40 \times 6) + (-40 \times 4) + (-50 \times 2) = 0$

$10 R_B - 240 - 160 - 100 = 0$

$10 R_B = 500$

$\boxed{R_B = 50 \text{ kN}}$

$\boxed{R_A = 80 \text{ kN}}$

SF @ B = −50 kN

SF @ D = −50 + 40 = −10 kN

SF @ C = −50 + 40 + 40 + 50 = 80 kN

SF @ A = −50 + 40 + 40 + 50 − 80

= 0 kN

BM @ B = 0 kNm

BM @ D = 50 × 4 = 200 kNm.

BM @ C = (50 × 8) + (−40 × 4) + (−40 × 2)

= 400 − 160 − 80

= 160 kNm.

BM @ A = (50 × 10) + (−40 × 6) + (−40 × 4) + (−50 × 2)

= 500 − 240 − 160 − 100

= 0 kNm.

To Find BM_{max}.

SF @ E = R_A − 50 − 10(x − 2)

= 80 − 50 − 10x + 20

= 50 − 10x

SF @ E = 0

50 − 10x = 0

−10x = −50

$x = \frac{50}{10} = 5$ m

$\boxed{x = 5 \text{ m}}$