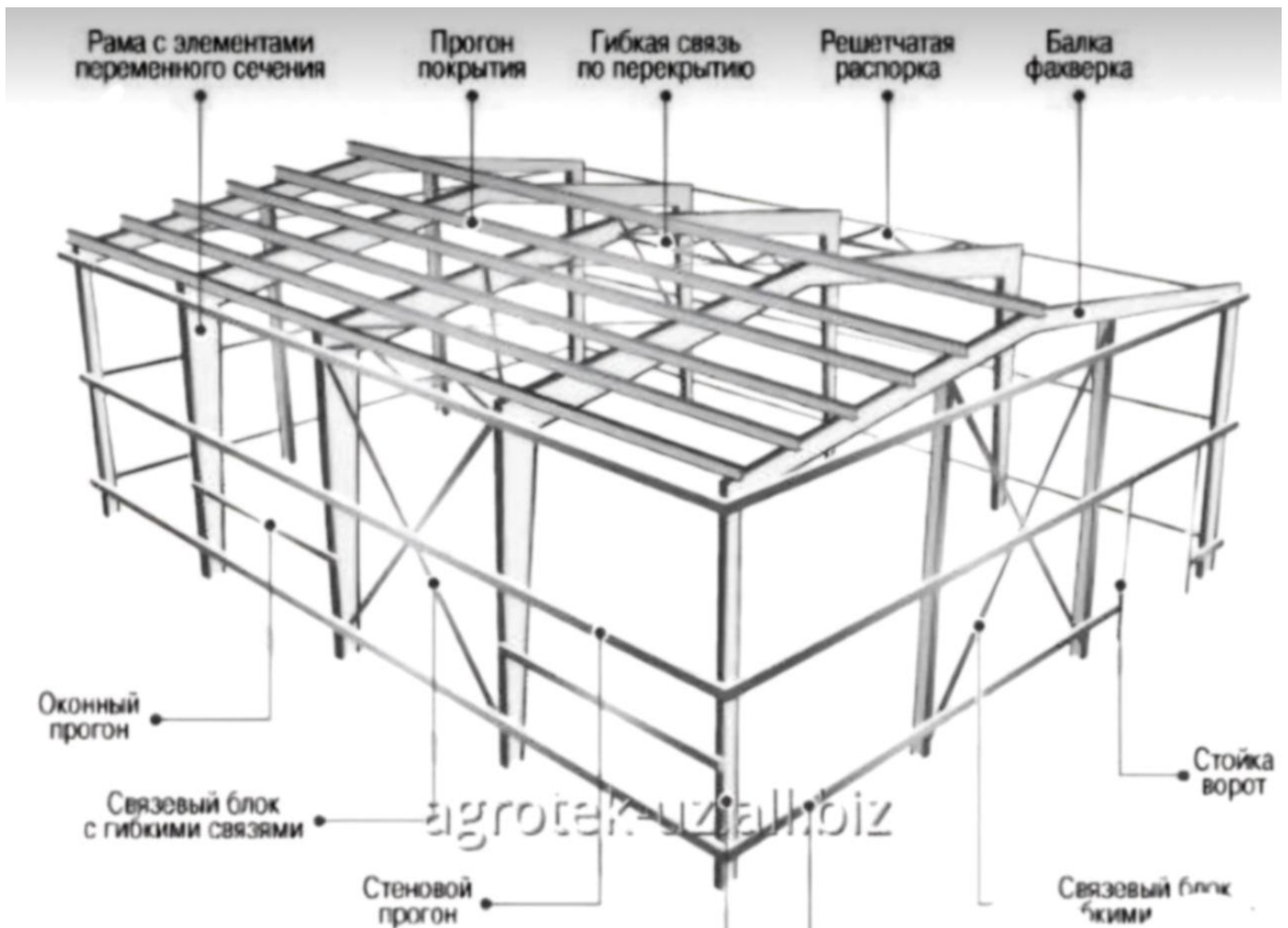




Theory of structure



Assistant Lecturer

Maryam Mohammed Al-aarajy

الموضوع :

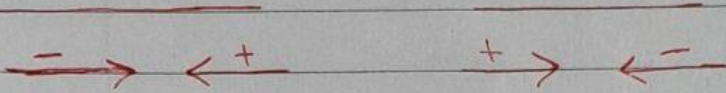
التاريخ

م/ الاشارات

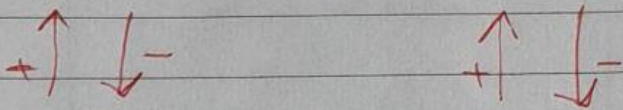
الرسم

نوع الانفعال

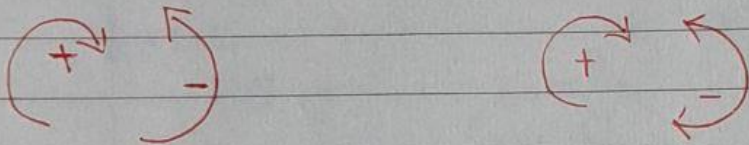
Axial Force



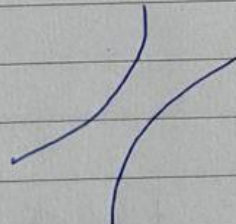
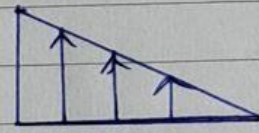
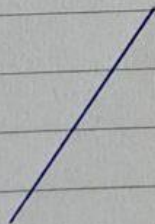
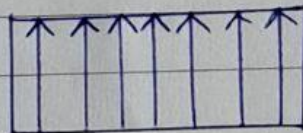
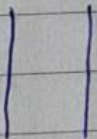
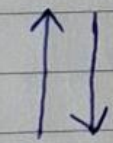
Shear Force



Bending M



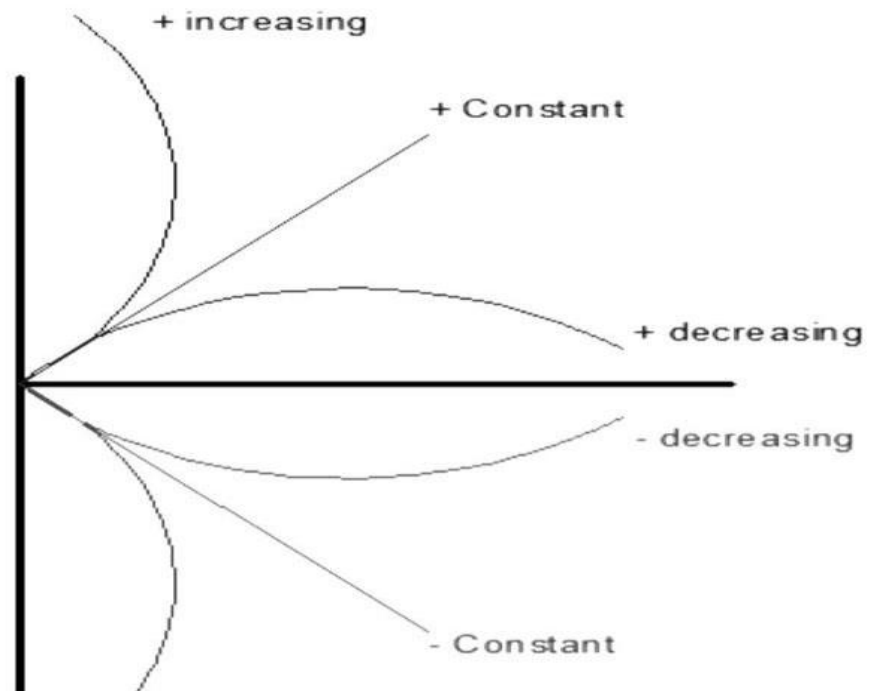
م/ رسم الاعمال



CLEAR

Shear force, Bending Moment and Axial Force Diagrams.

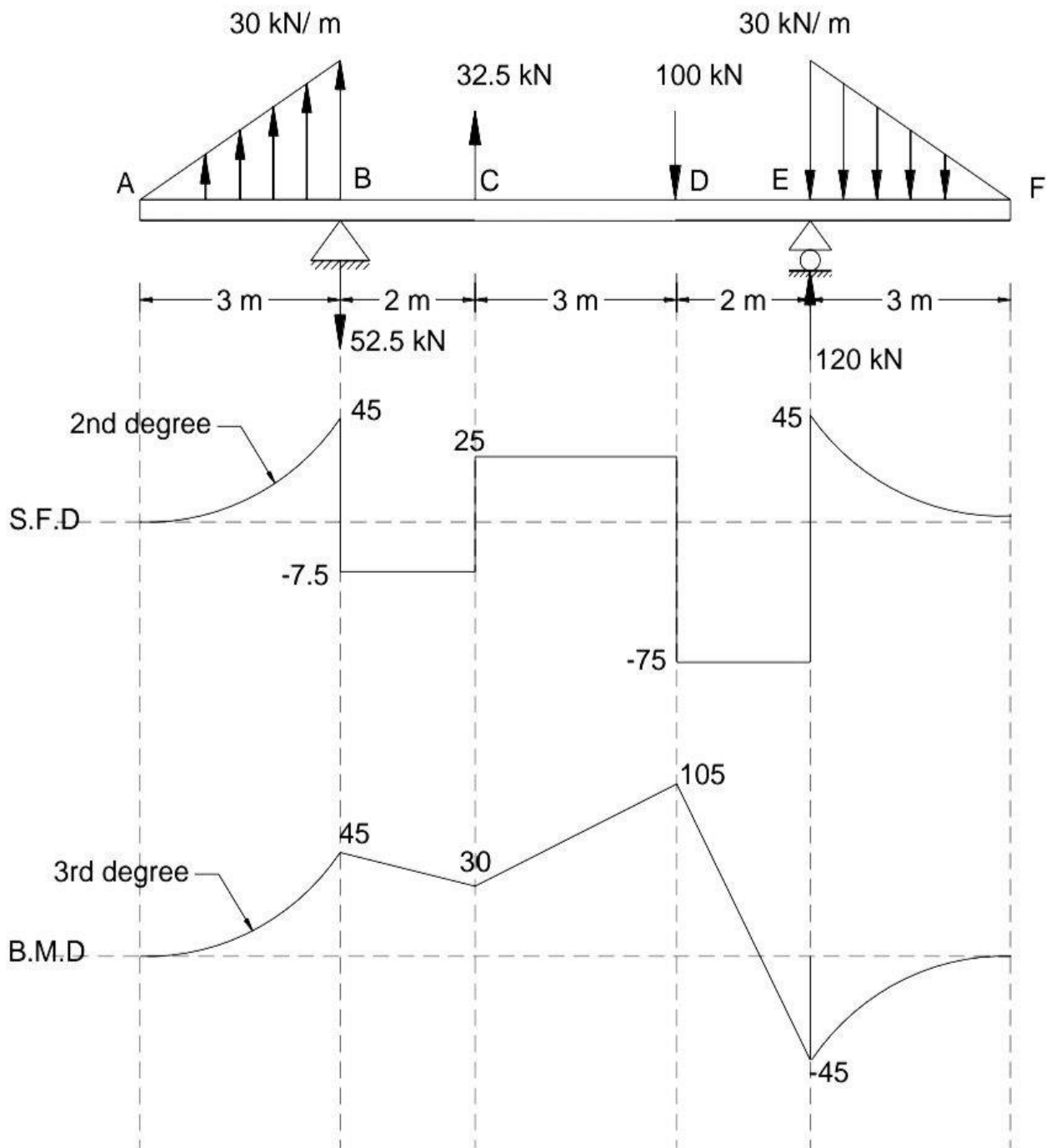
3- Curves:-



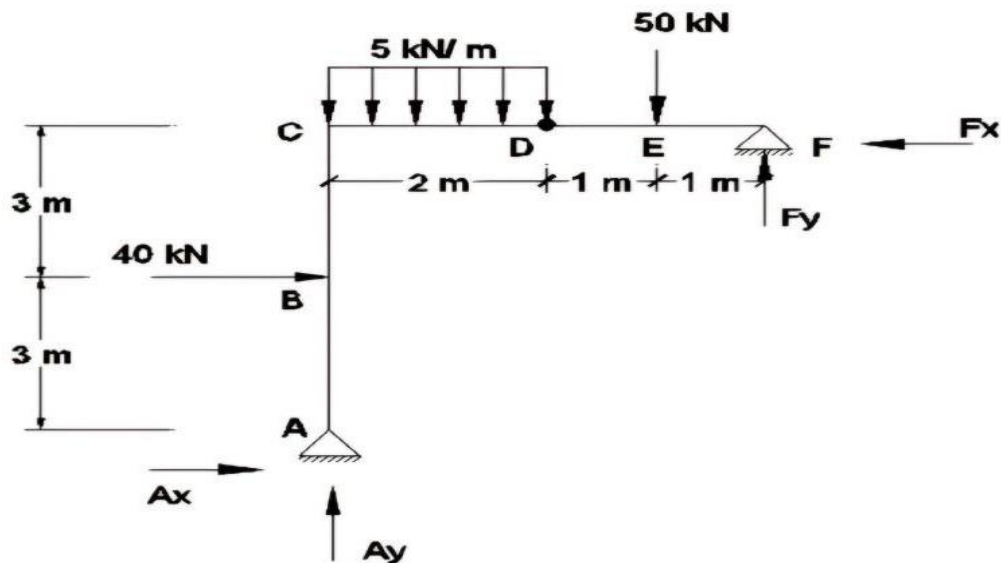
Shear force, Bending Moment and Axial Force Diagrams.

Q/ Draw SFD and BMD

EX1:- Draw the axial force; shear force and bending moment diagrams.



EX4: Draw the axial force; shear force and bending moment diagrams for the frame shown below.



Sol:

For segment (DEF)

$$\sum M_D = 0,$$

$$F_y * 2 - (50 * 1) = 0$$

$$F_y = 25 \text{ kN} \uparrow$$

For whole structure

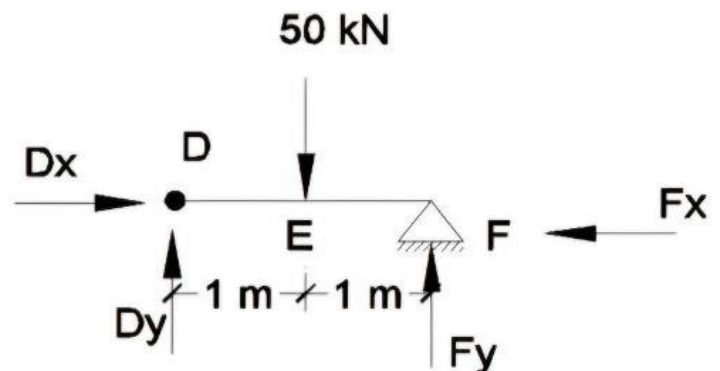
$$\sum M_A = 0 \Rightarrow F_x * 6 + (25 * 4) - (50 * 3) - (10 * 1) - (40 * 3) = 0$$

$$F_x = 30 \text{ kN} \leftarrow$$

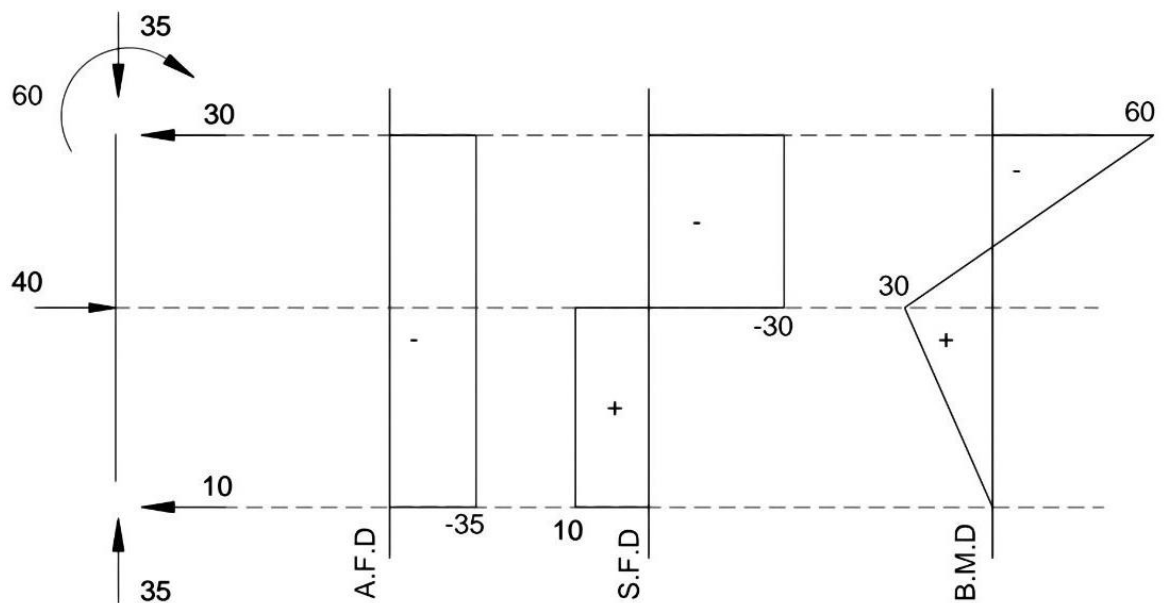
$$\uparrow \sum F_y = 0,$$

$$A_y + 25 - 50 - (5 * 2) = 0, \Rightarrow A_y = 35 \text{ kN} \uparrow$$

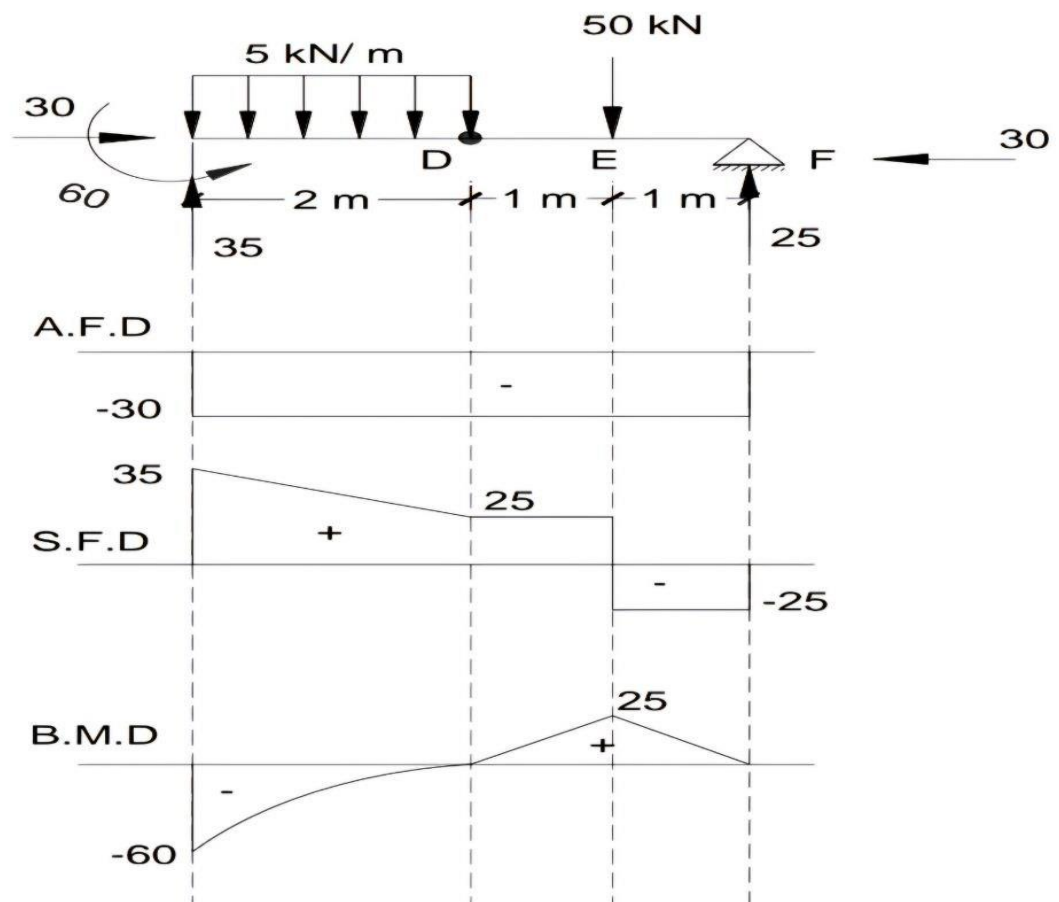
$$\rightarrow \sum F_x = 0, \Rightarrow -A_x - 30 + 40 = 0, \Rightarrow A_x = 10 \text{ kN} \leftarrow$$



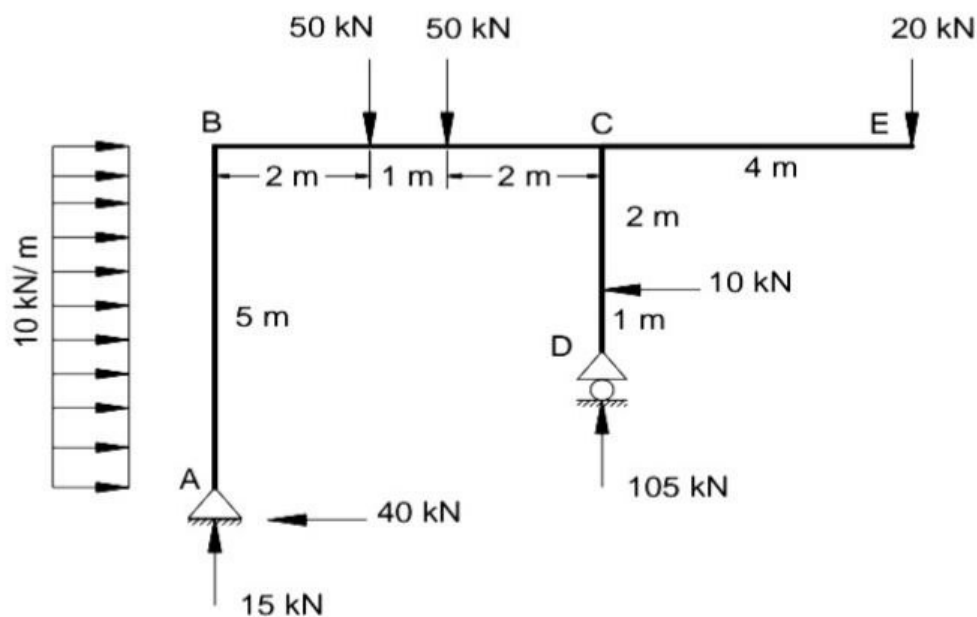
Segment ABC



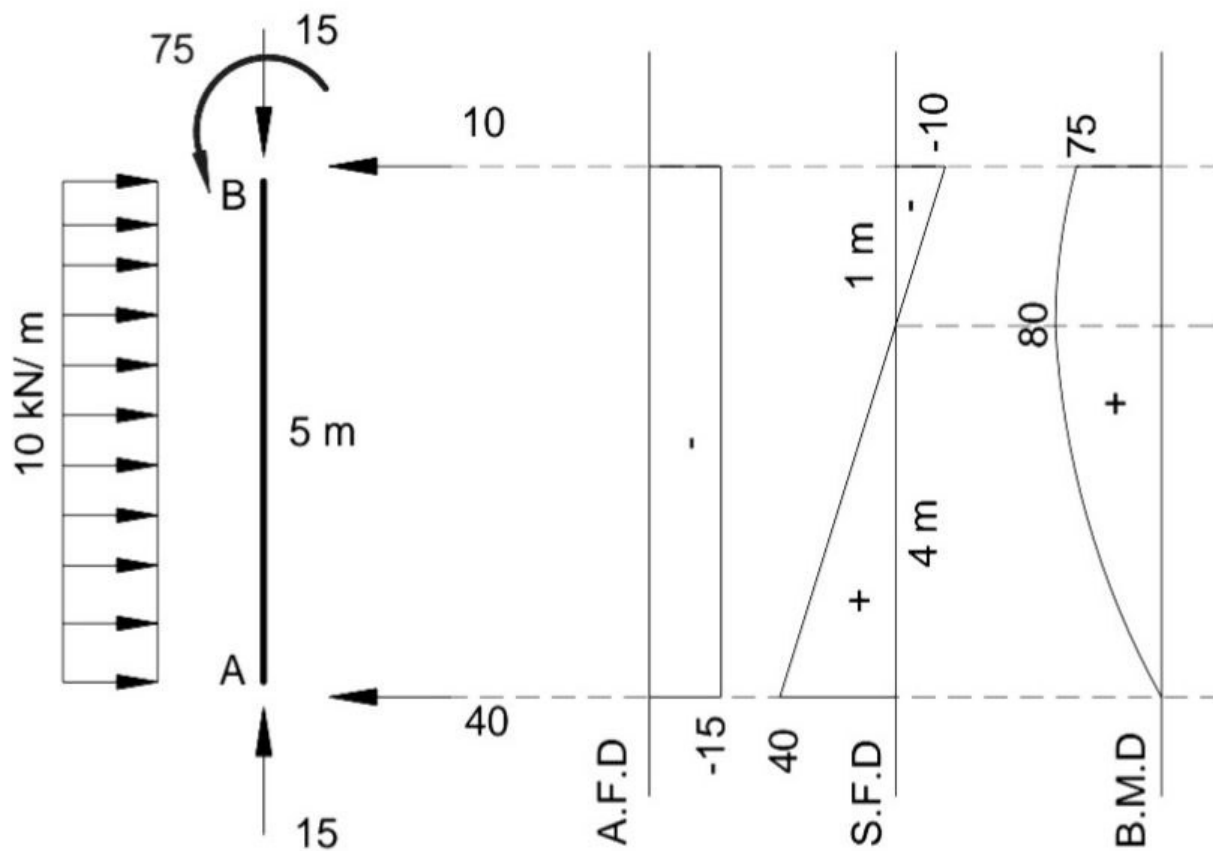
Segment CDEF



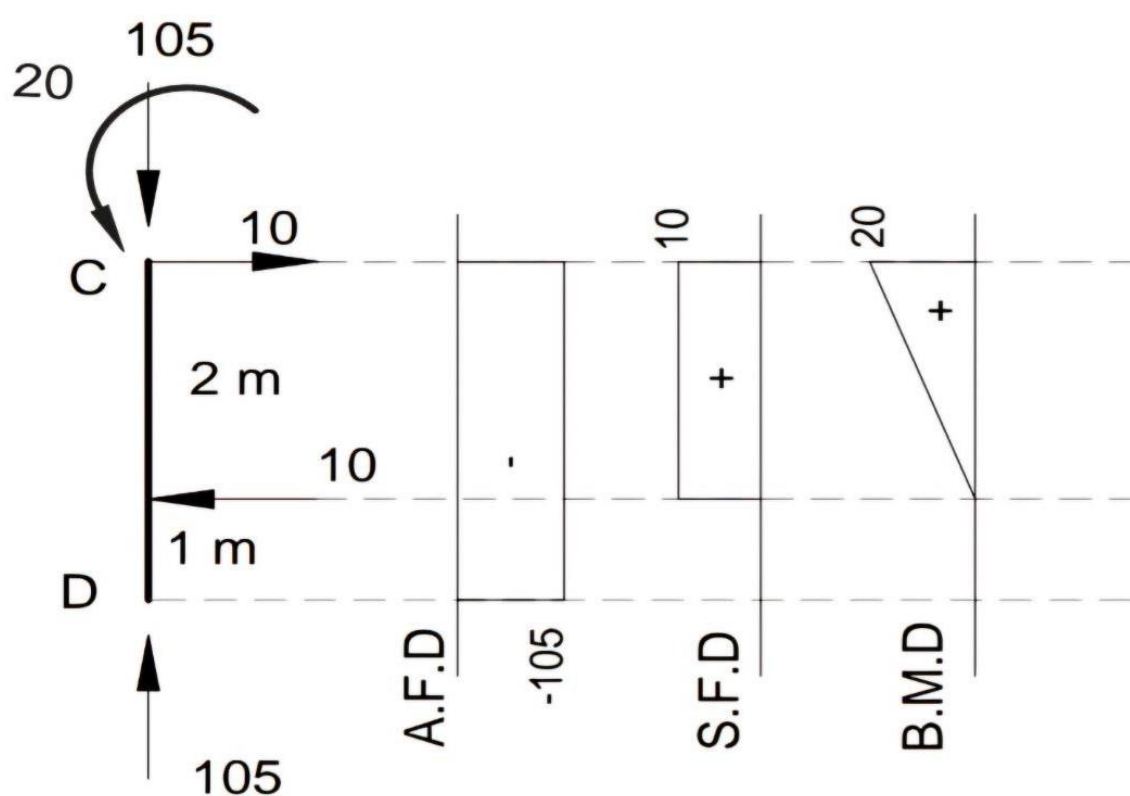
EX2: Draw the axial force; shear force and bending moment diagrams for the frame shown below.



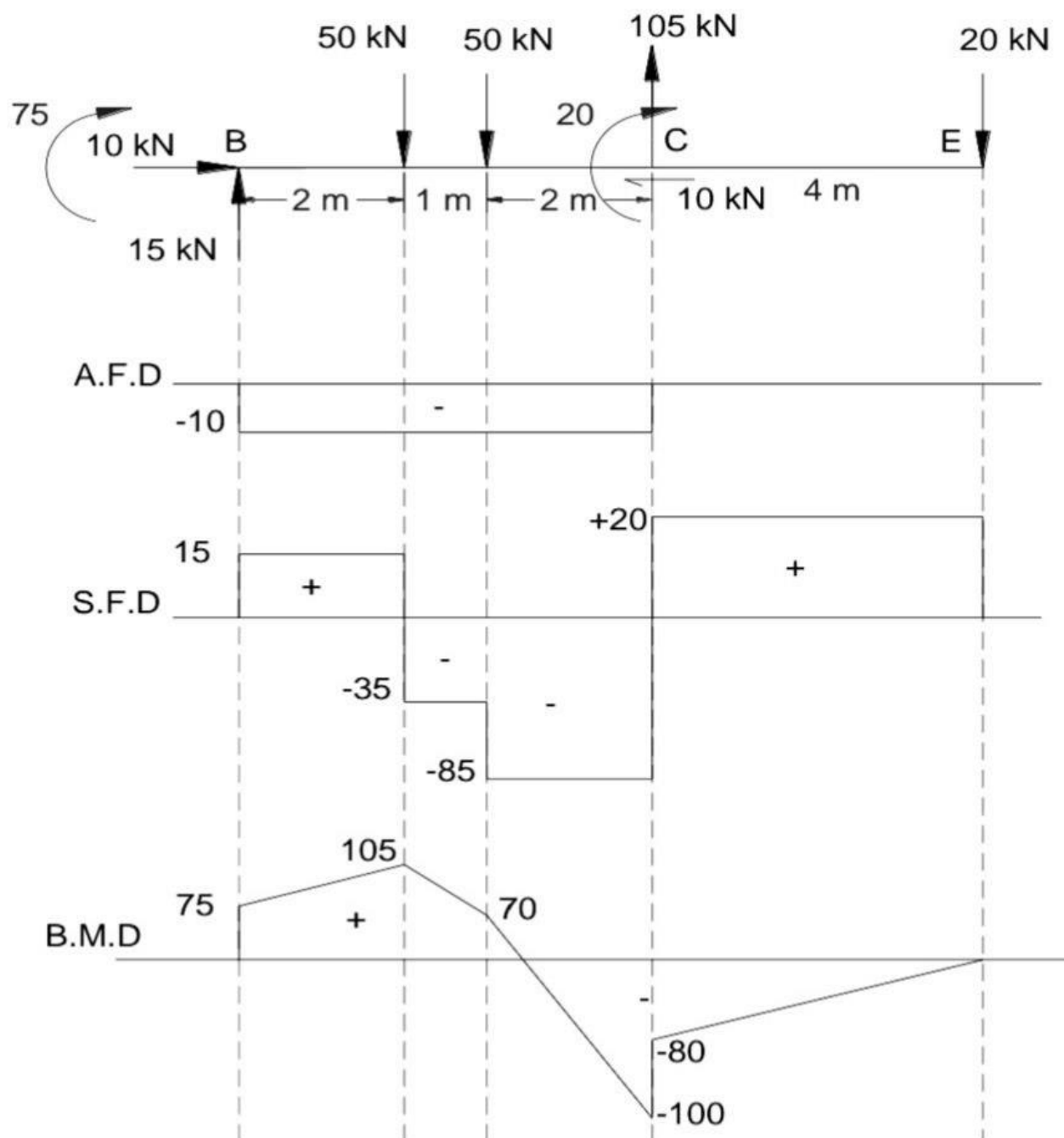
Sol: - SEGMENT (AB)



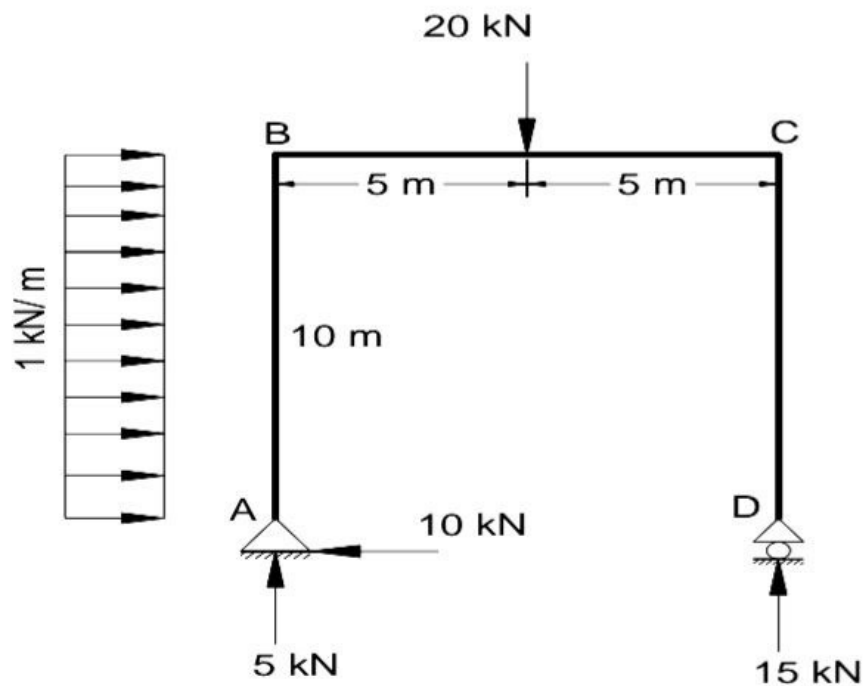
Segment (DC)



Segment BCE

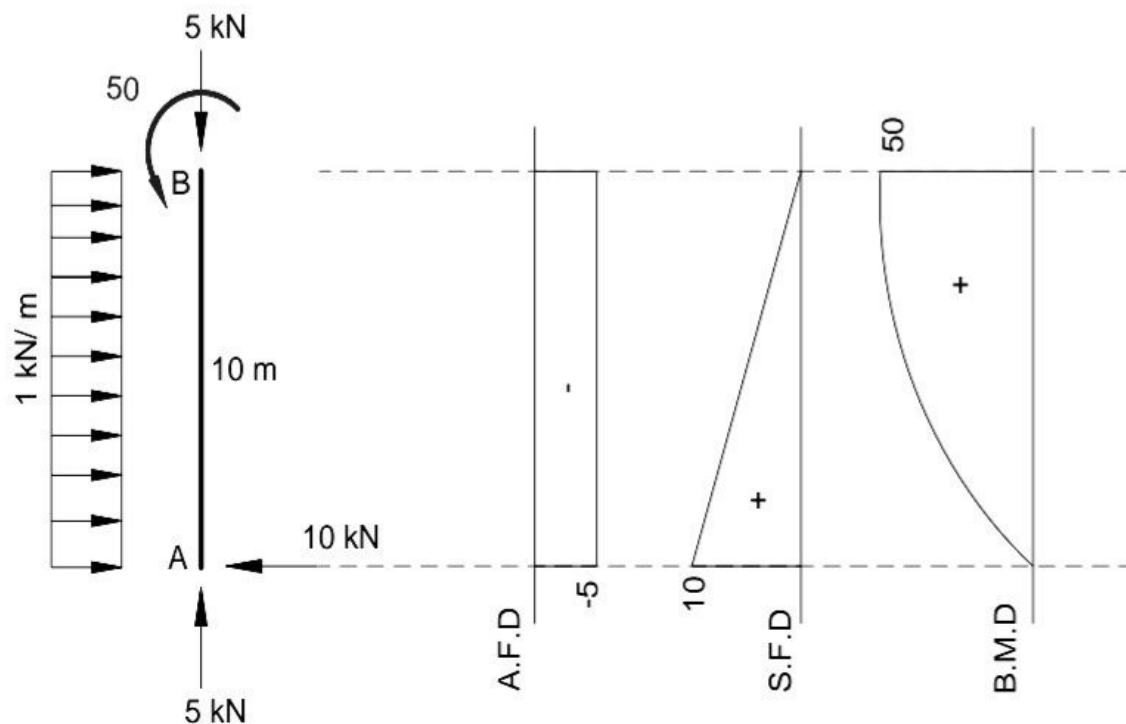


EX5: Draw the axial force; shear force and bending moment diagrams for the frame shown below.

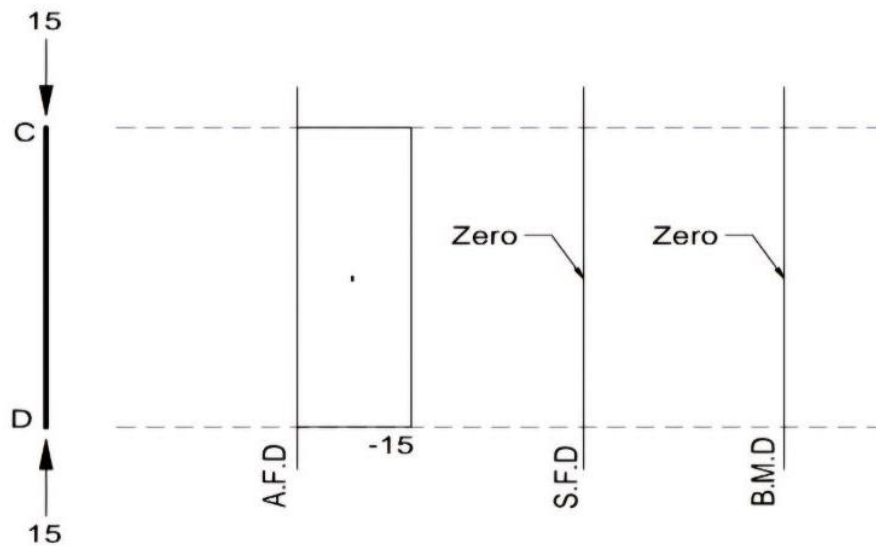


Sol:-

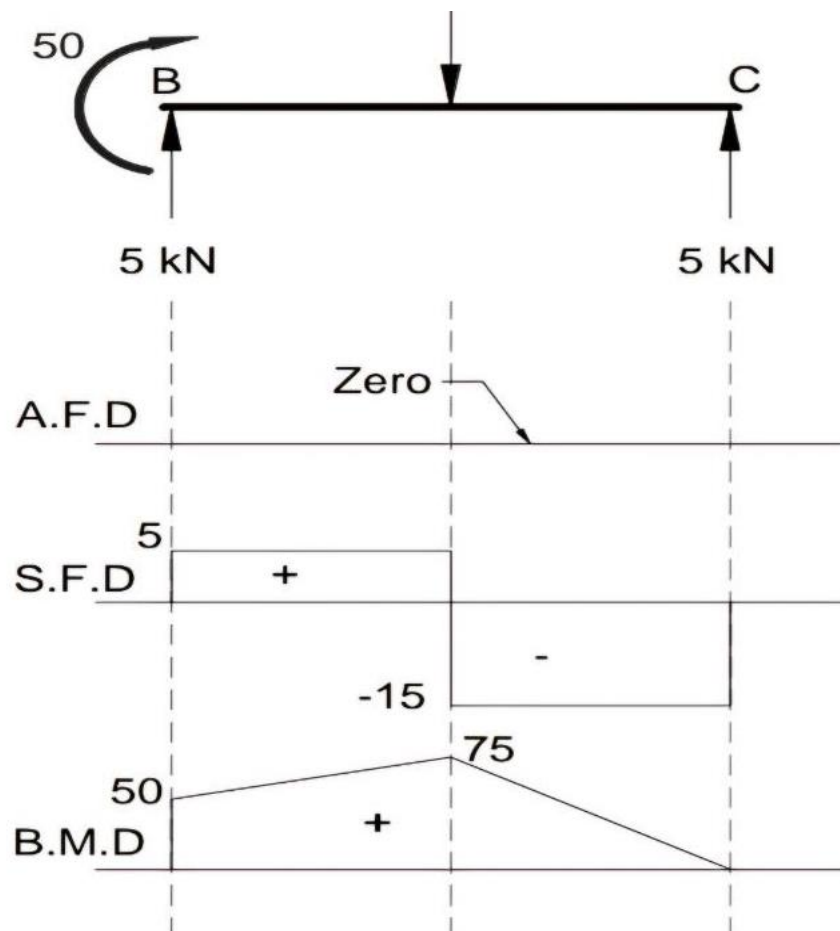
For Member AB:



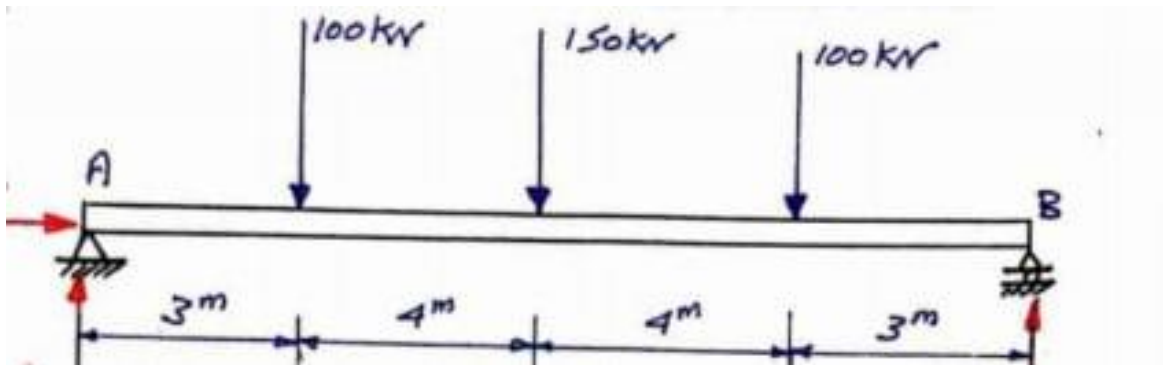
For Member CD:



For Member BC:



H.W1: Draw the axial force; shear force and bending moment diagrams for the frame shown below.



H.W2: Draw the axial force; shear force and bending moment diagrams for the frame shown below.

