

Answer Mid-Term Exam

Total Marks: 30

No. of Questions: 2

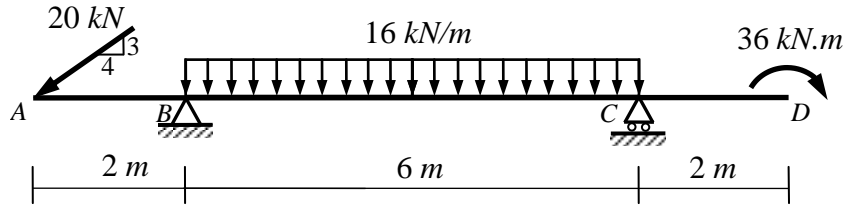
Name:

Code:

Question (1): (20 Marks)

For the shown beam:

- Determine the reactions
- Draw the normal force, shear force and bending moment diagrams.



Solution:

Reactions

$$+\rightarrow \sum F_x = 0 \rightarrow \boxed{B_x = 16 \text{ kN} \rightarrow}$$

$$+\circlearrowleft \sum M_B = 0:$$

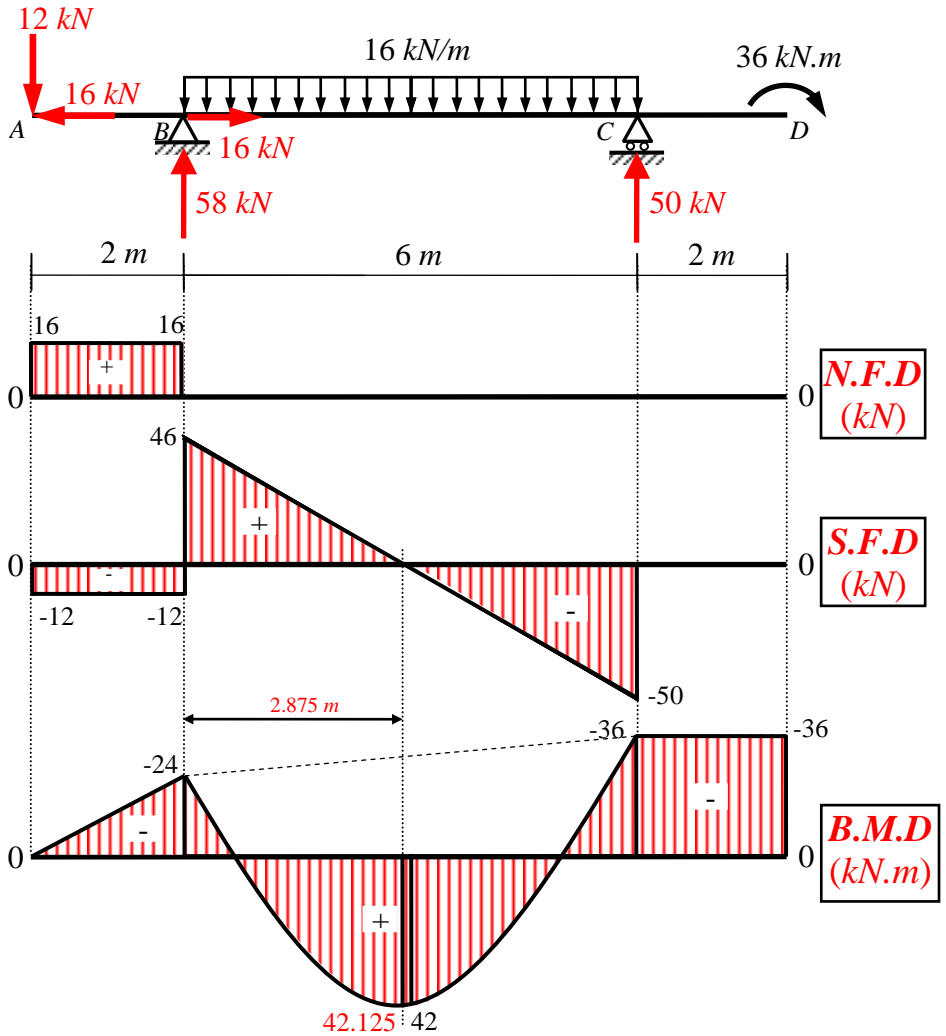
$$-12 \times 2 + 96 \times 3 - C_y \times 6 + 36 = 0$$

$$\rightarrow \boxed{C_y = 50 \text{ kN} \uparrow}$$

$$+\circlearrowleft \sum M_C = 0$$

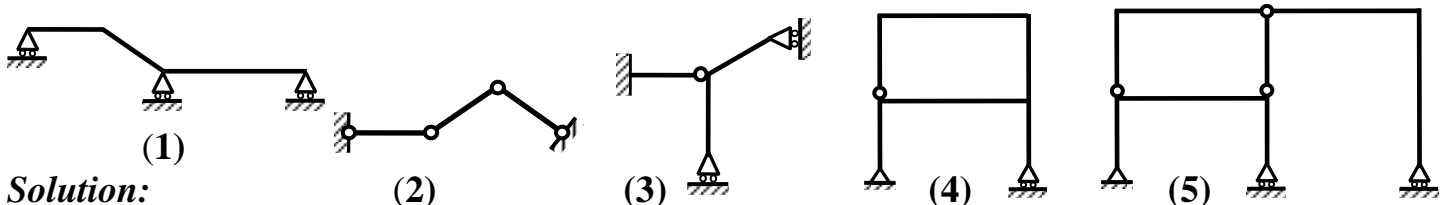
$$-12 \times 8 + C_y \times 6 - 96 \times 3 + 36 = 0$$

$$\rightarrow \boxed{B_y = 58 \text{ kN} \uparrow}$$



Question (2): (10 Marks)

Determine whether each of the shown structures is stable or unstable. If stable, determine whether it is statically determinate or indeterminate. If statically indeterminate, determine the degree of indeterminacy.



Solution:

(1) Unstable	(3) Stable + Indet. to the 1 st degree.	(5) Stable + Det.
(2) Unstable	(4) Stable + Indet. to the 2 nd degree.	

With my best wishes

Dr. M. Abdel-Kader