

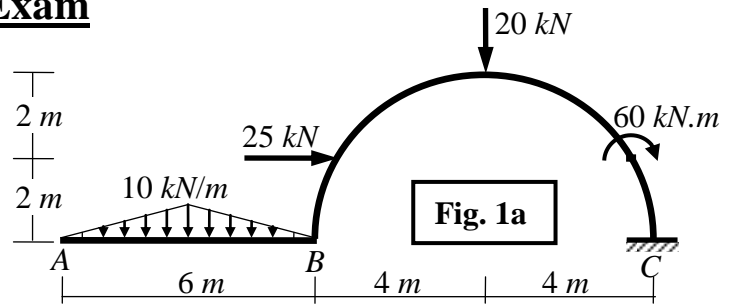
Final Exam

- Attempt all questions.
- The Exam consists of **3** questions in **1** page.
- Maximum grade is **60 Marks**.

Question (1): (20 Marks)

For the structures shown in **Fig. 1a** and **1b**, determine the reactions at the supports.

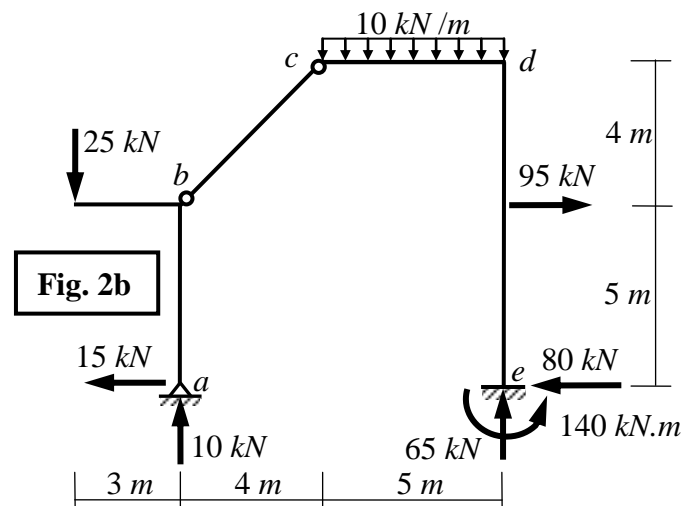
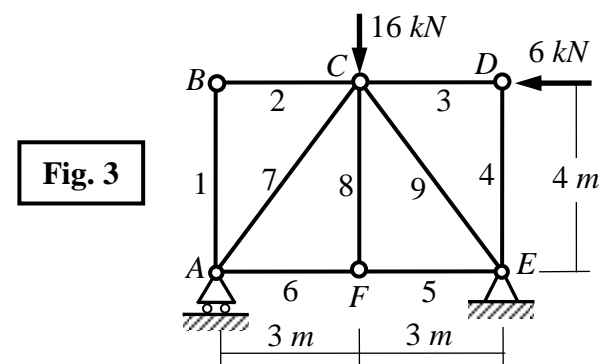
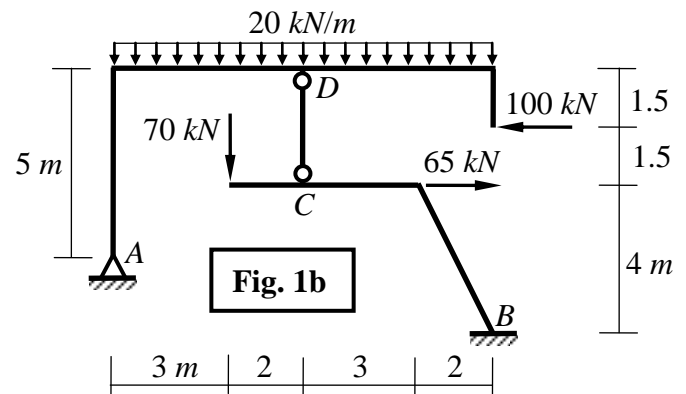
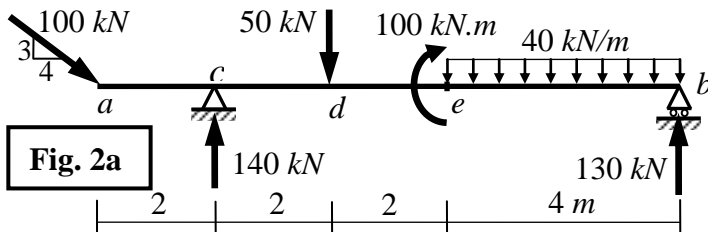
Note: In your answer sheet, draw the final reactions (direction and magnitude) on the structures.



Question (2): (20 Marks)

For the beam and frame shown in **Fig. 2a** and **2b**, draw the normal force, shear force and bending moment diagrams.

Note: All the reactions (except C_x in beam) are given.



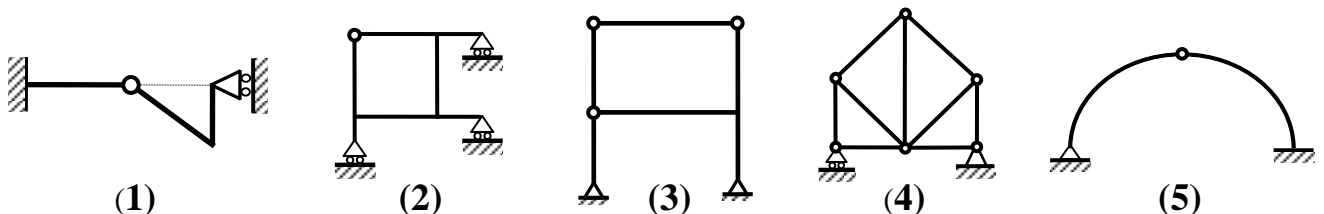
Question (3): (20 Marks)

(a) For the truss shown above in **Fig. 3**:

- (i) Determine the reactions at the supports **A** and **E**.
- (ii) Using the **method of joints**, determine the forces in all truss members.
- (iii) Using the **method of sections**, determine the forces in members **FE** and **CE** (members **5** and **9**).

Note: In your answer sheet, draw the truss and put the force magnitude and the indication (Tension or Compression) on each member, or put the results in a table.

(b) 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.



With my best wishes

Dr. M. Abdel-Kader