



**King Saud University
College of Engineering
Department of Civil Engineering**

FINAL EXAM

CE361 Structural Analysis I – 1st Semester 1427 - 28 H

Saturday, 8th Muharam 1428

Time allowed: 3 hrs

Student name	
Student number	
Section	

Total number of Questions: 5

Attempt all questions

Questions	Maximum Marks	Marks obtained
Q # 1	10	
Q # 2	8	
Q # 3	12	
Q # 4	10	
Q # 5	10	
Total marks		<u>50</u>

Total marks obtained (in words): _____



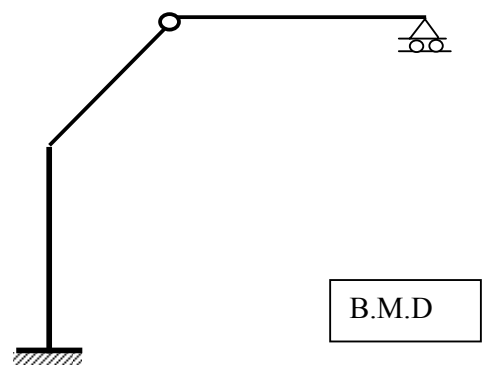
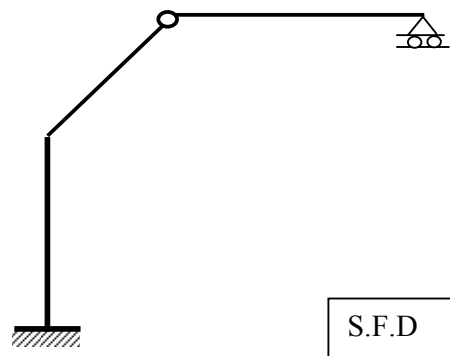
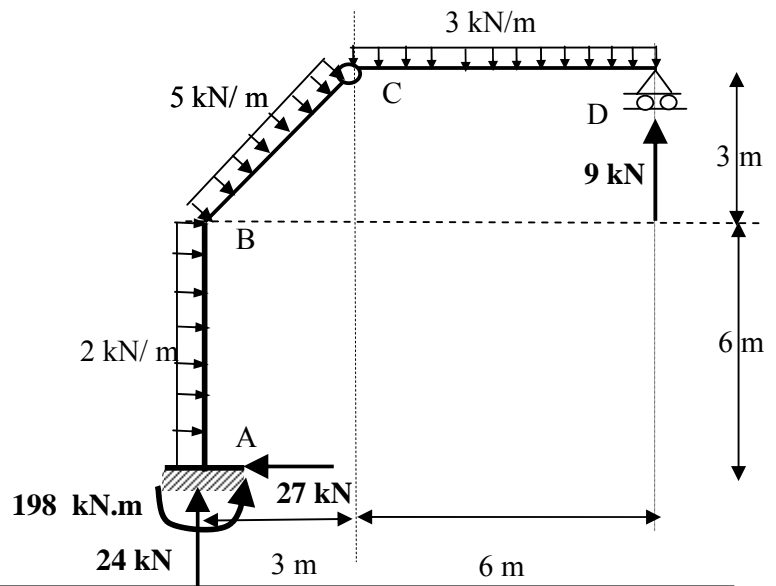
Student name

Student number

Marks obtained for Q1

Problem 1: (10 points)

The shown loaded frame has a fixed support at A, roller support at D, and a hinge at C. For the given reactions, it is required to draw the S.F.D and B.M.D showing all necessary values.





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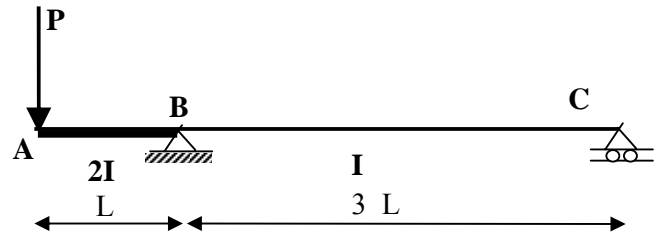
Student number

Marks obtained for Q2

Problem 2: (8 points)

For the shown loaded beam with variable inertia, it is required to determine the deflection at point A, using **Conjugate Beam Method**.

Given $EI = \text{constant}$





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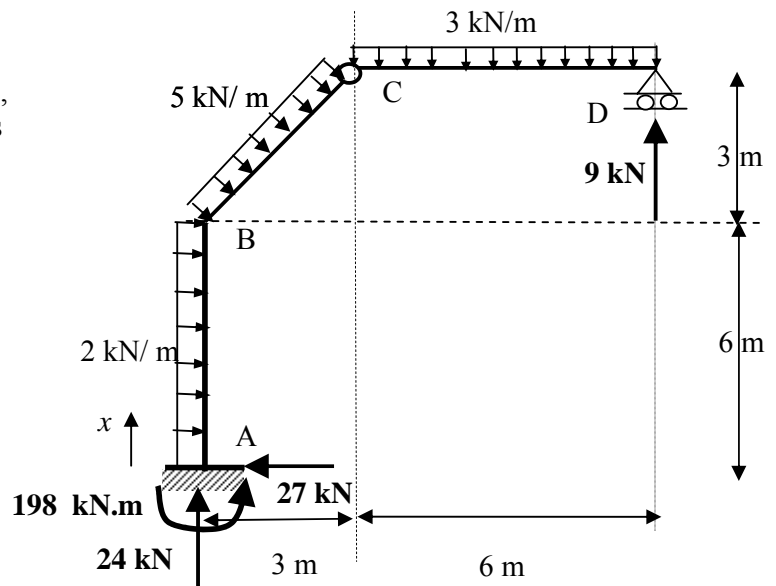
Student number

Marks obtained for Q3

Problem 3: (12 points)

For the same loaded frame as in problem 1, with the given reactions and constant cross section ($EI = \text{constant}$), it is required to;

- 1- Write the bending moment equation for member AB only, taking (x) as shown.
- 2- Use the Virtual Work Method to determine;
 - a- The horizontal displacement at point B
 - b- The rotation at point B





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Marks obtained for Q4

Student number

Problem 4: (10 points)

For the shown beam;

1- Draw the Influence lines of the reactions at supports

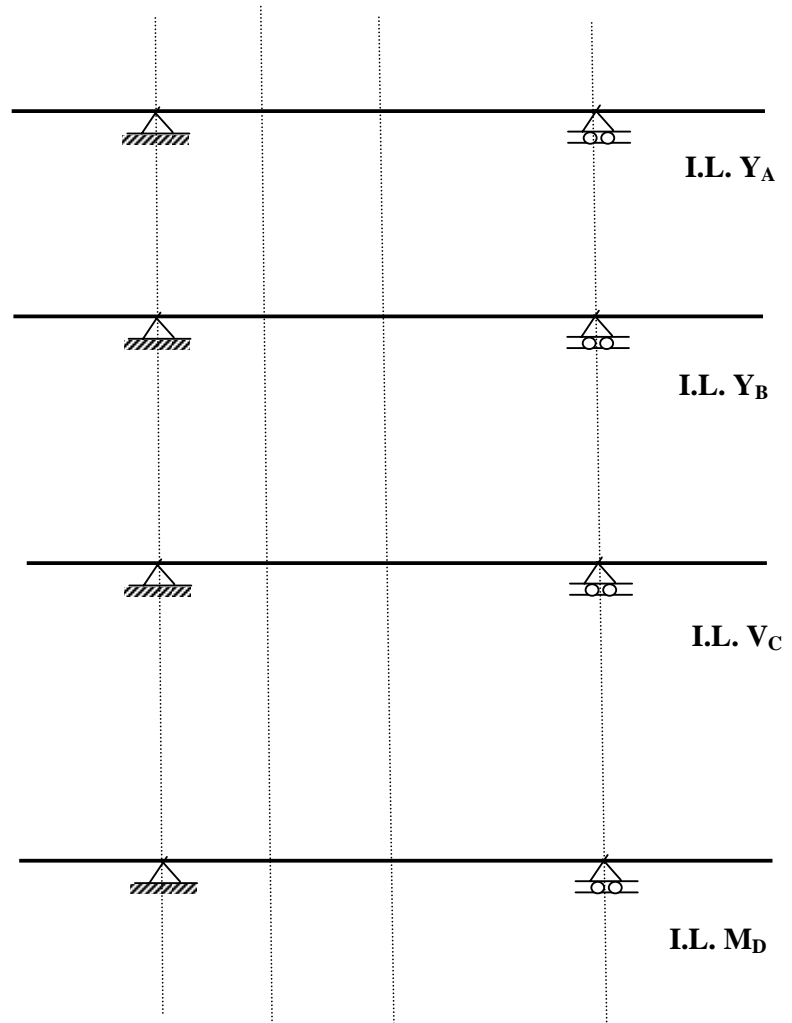
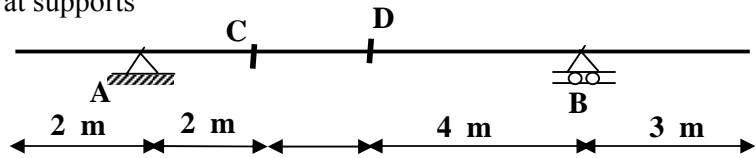
2- Draw Influence Line of shear at C

3- Draw Influence Line of moment at D

4- If the beam is subjected to a uniform dead load of 40 kN/m and a uniform live load of 20 kN/m;

a- Determine the maximum positive shear at C

b- Determine the maximum positive Moment at D





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Marks obtained for Q5

Problem 5 : (10 points)

Determine the absolute maximum moment due to the given moving loads on the bridge

