



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

**FINAL EXAM**

**CE 361 Structural Analysis I – 2nd Semester 1427 - 28 H**

**Saturday, 23<sup>rd</sup> Jumadi I 1428**

**Time allowed: 3 hrs**

<b>Student name</b>	
<b>Student number</b>	
<b>Student Number in class</b>	

*Total number of Questions: 5*

**Attempt all questions**

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

Total marks obtained (in words): \_\_\_\_\_



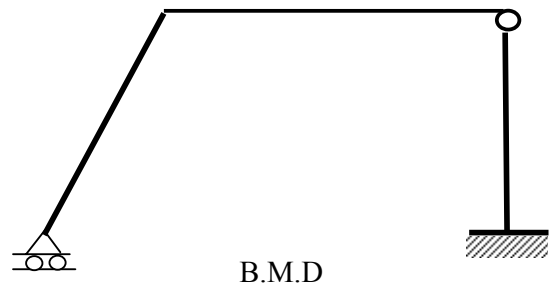
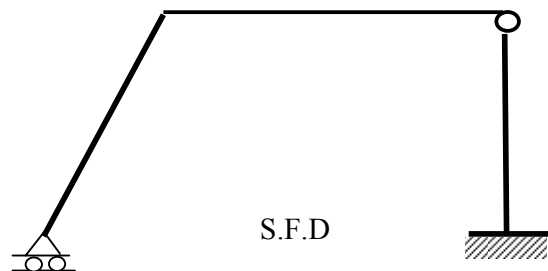
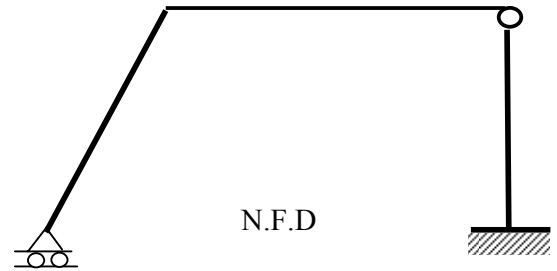
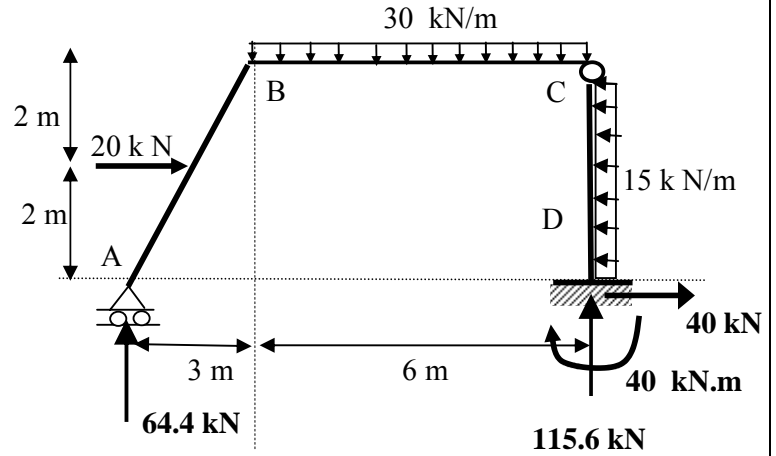
Student name

Student number

Marks obtained for Q1

**Problem 1: (12 points)**

For the shown loaded frame with the given reactions, it is required to draw the N.F.D, S.F.D and B.M.D, showing all necessary values.





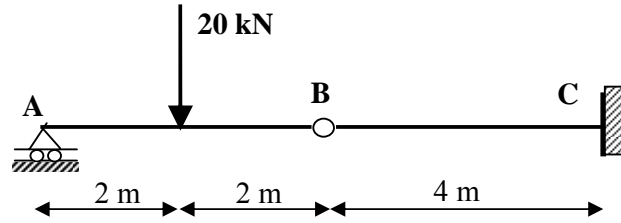
Student name

Student number

Marks obtained for Q2

**Problem 2: (8 points)**

For the shown loaded beam, it is required to determine the deflection at point B, using Conjugate Beam Method.  
Given  $EI = \text{constant}$





Student name

Student number

Marks obtained for Q3

**Problem 3: (12 points)**

For the shown loaded frame it is required to;

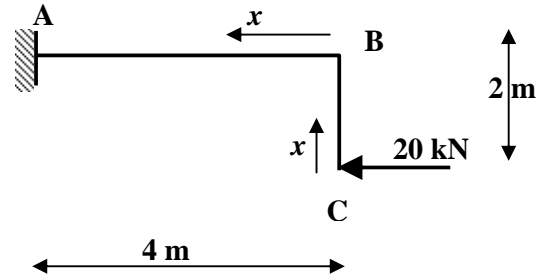
1- Write the bending moment equations for member BA and CB, taking (x) as shown.

2- Use the Virtual Work Method to determine;

a- The horizontal displacement at point C

b- The rotation at point C

Given  $EI = \text{constant}$





Student name

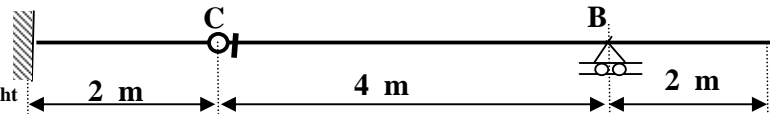
Student number

Marks obtained for Q4

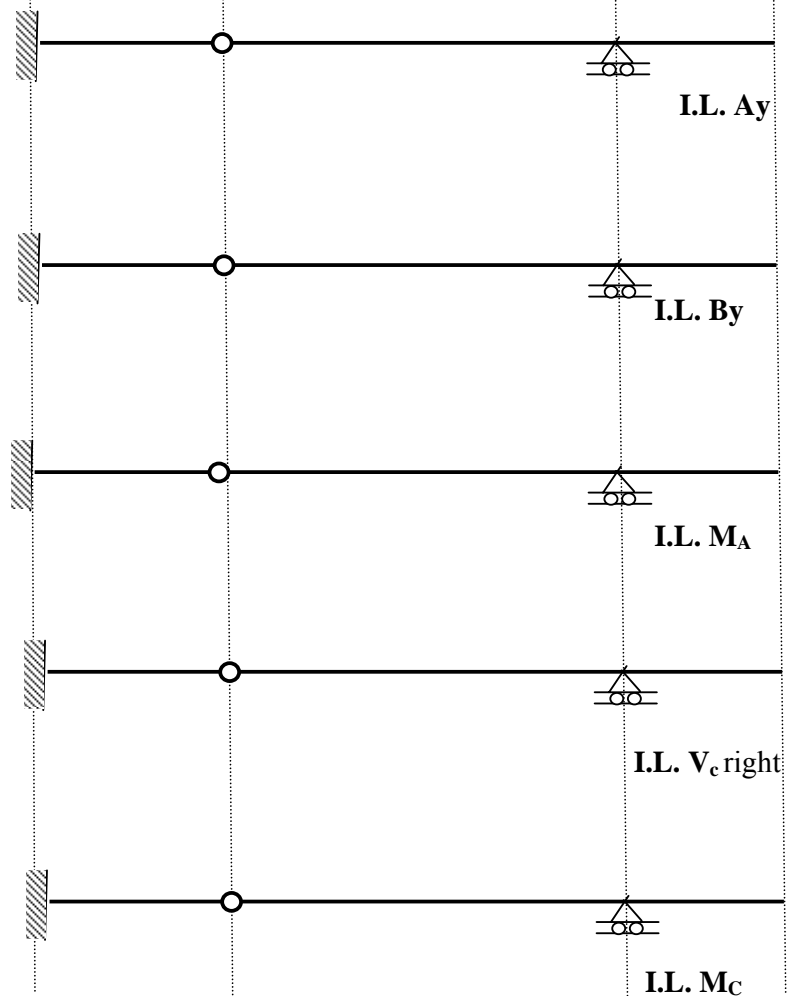
### Problem 4: (10 points)

For the shown beam;

- 1- Draw the Influence lines of the reactions  $A_y$ ,  $B_y$ , and  $M_A$
- 2- Draw Influence Line of shear at  $C$  Right
- 3- Draw Influence Line of moment at  $C$
- 4- If the beam is subjected to a uniform dead load of  $40 \text{ kN/m}$  and a uniform live load of  $20 \text{ kN/m}$ ;
  - a- Determine the maximum positive shear at  $C$  Right
  - b- Determine the maximum negative Moment at  $A$



Note : show all necessary values on diagrams





Student name

Student number

Marks obtained for Q5

**Problem 5 : (8 points)**

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

