



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

FINAL EXAM

GE201 Statics - Second Semester 1427 - 28 H

Wednesday, 20th Jumada-I 1428

Time allowed: 3 hrs (8.00 – 11.00 AM)

Student name (in Arabic)	
Student number	
Section	

Total number of Questions: 5

Answer all questions

Questions	Maximum Marks	Marks Obtained
Q # 1	10	
Q # 2a	6	
Q # 2b	6	
Q # 3	12	
Q # 4	8	
Q # 5	8	
Total marks		<div>50</div>

Total marks obtained (in words): _____

Instructor



Student name

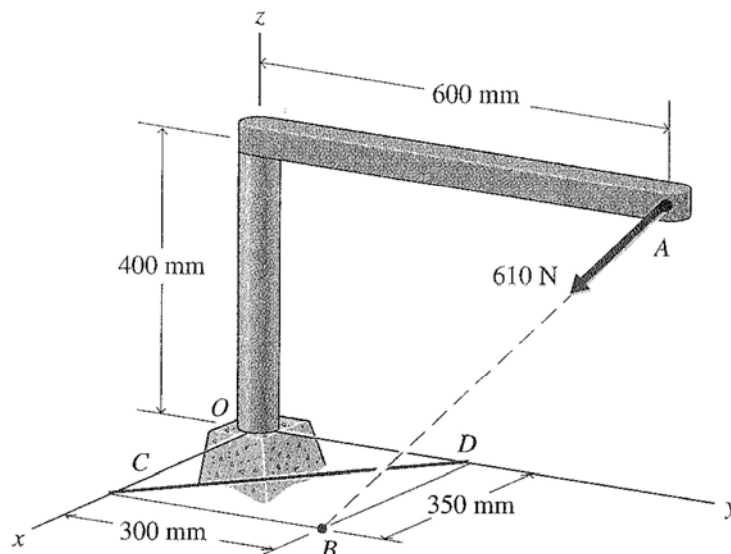
Student number

Marks obtained for Q1

Question # 1 (10 points)

The cable **AB** exerts a force ($T = 610 \text{ N}$) as shown in the figure:

- Find the moment about the **point O**.
- Find the moment about the **line CD**.



Solution:



Student name

Student number

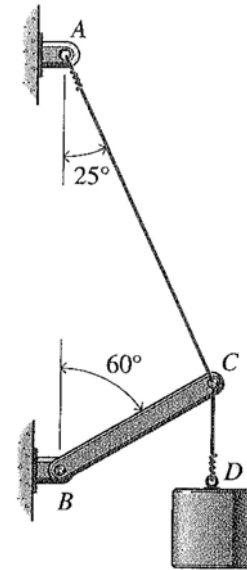
Marks obtained for Q2a

Question # 2a (6 points)

A **100 kg** block is supported by a member BC and two cables CD and AC as shown in the figure.

Determine the force in the **member BC**

Solution:





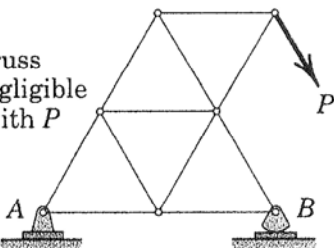
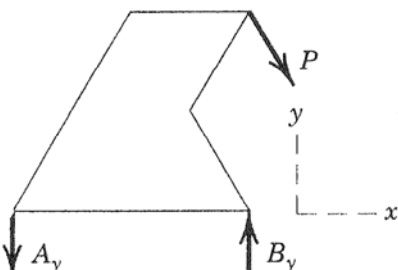
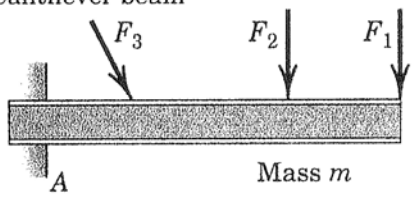
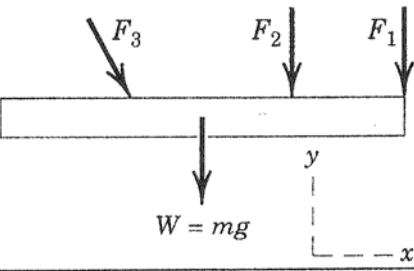
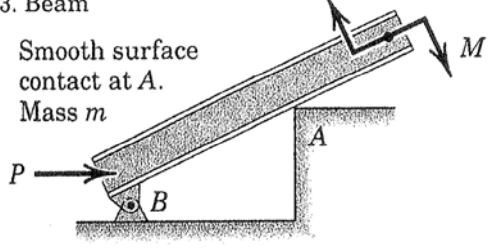
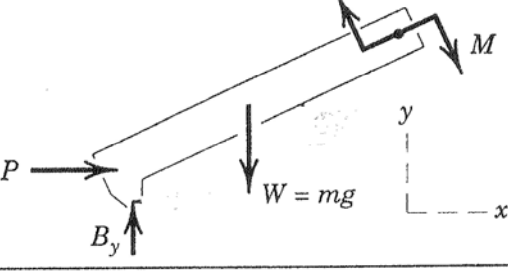
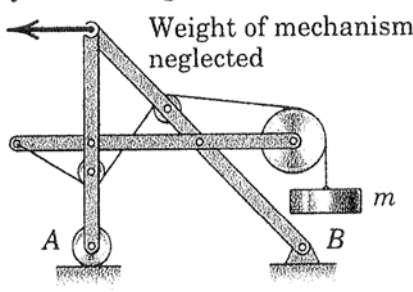
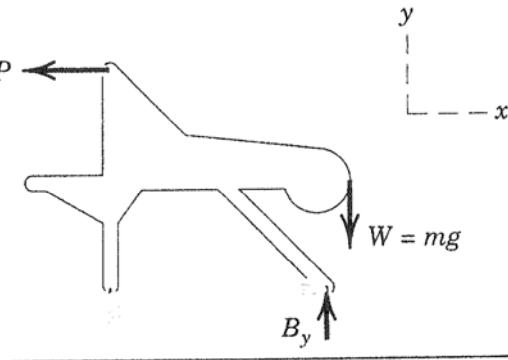
Student name

Student number

Marks obtained for Q2b

Question # 2b (6 points)

Incomplete FBD are shown for each mechanical system as shown below. **Complete the FBD.**

Mechanical System	Incomplete FBD
<p>1. Plane truss</p> <p>Weight of truss assumed negligible compared with P</p> 	
<p>2. Cantilever beam</p>  <p>Mass m</p>	
<p>3. Beam</p> <p>Smooth surface contact at A.</p> <p>Mass m</p> 	
<p>4. Rigid system of interconnected bodies analyzed as a single unit</p> <p>Weight of mechanism neglected</p> 	



Student name

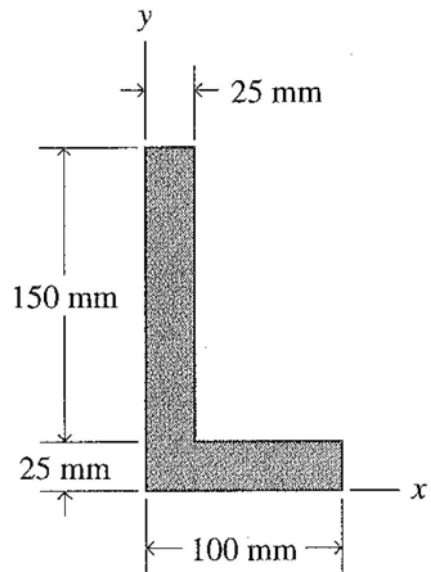
Student number

Marks obtained for Q3

Question # 3 (12 points)

For the section shown in the figure, determine:

- (a) the x - and y - coordinates of the centroid.
- (b) the moment of inertia about x -axis (I_x).
- (c) the moment of inertia about the x -axis passing through the centroid (\bar{I}_x).



Solution:



Student name

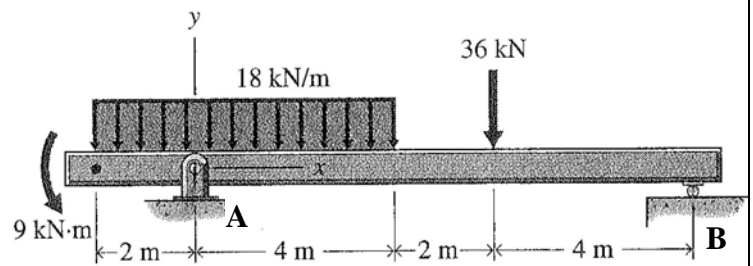
Student number

Marks obtained for Q4

Question # 4 (8 points)

For the beam shown in the figure, determine:

- the reactions at supports **A** and **B**.
- the shear force and bending moment values at the support **A**



Solution:



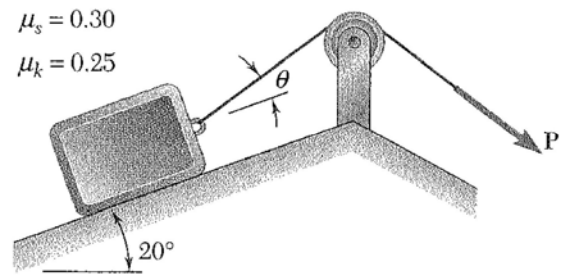
Student name

Student number

Marks obtained for Q5

Question # 5 (8 points)

Determine whether the **10 kg** block shown is in equilibrium, and find the magnitude and direction of the friction force when **P = 40 N** and **$\theta = 20^\circ$** .



Solution: