King Fahd University of Petroleum & Minerals

Department of Civil and Environmental Engineering

CE 201 – Statics

Semester: 142
Examination: Second Major
Date (Day): April 21, 2015 (Tuesday)
Time: 07:00 – 09:30 p.m.

Section	1	2	3	4	5	6	7
Instructor	Al-Malack	Al-Malack	Chowdhury	Al-Osta	Ahmed	Essa	Al-Attas
Time	07:00	08:00	09:00	10:00	11:00	10:00	11:00
Tick							

Student's Name :
Student's ID :

Problem	Assigned Grade	Earned Grade
1A	10 Points	
1B	15 Points	
2A	10 Points	
2B	15 Points	
3	25 Points	
4	25 Points	
Total	100 (Points)	

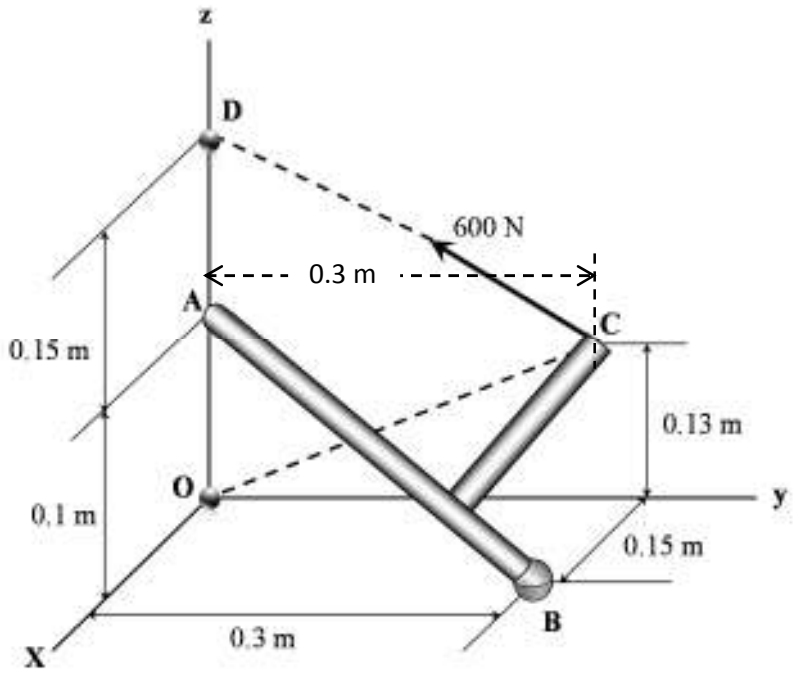
Good Luck

Problem 1A (10 Points)

The T-shaped lever shown in the below figure supports a 600-N force. Determine:

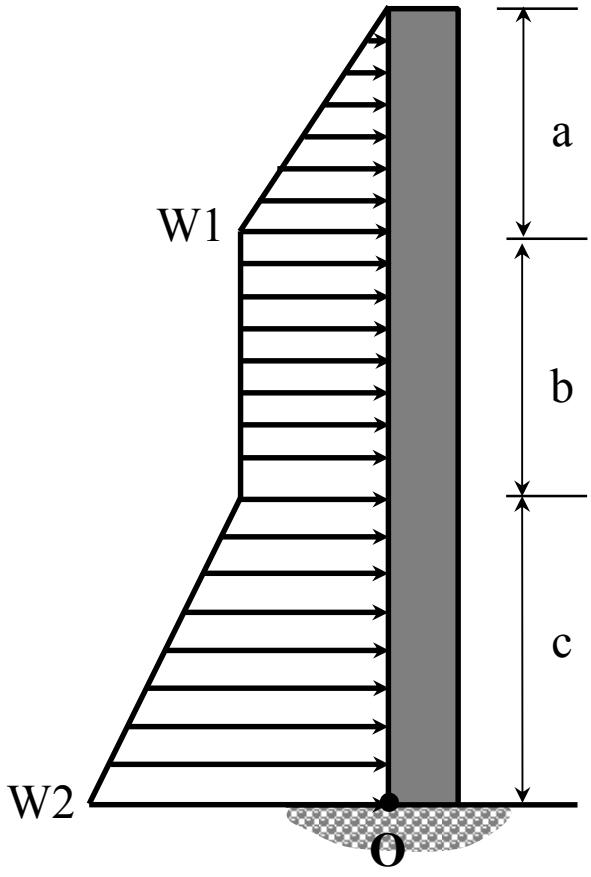
(8 Points) 1. Determine the momemt of the force about rod AB.

(2 Points) 2. Determine the prpendicular distance between the force and the rod AB.



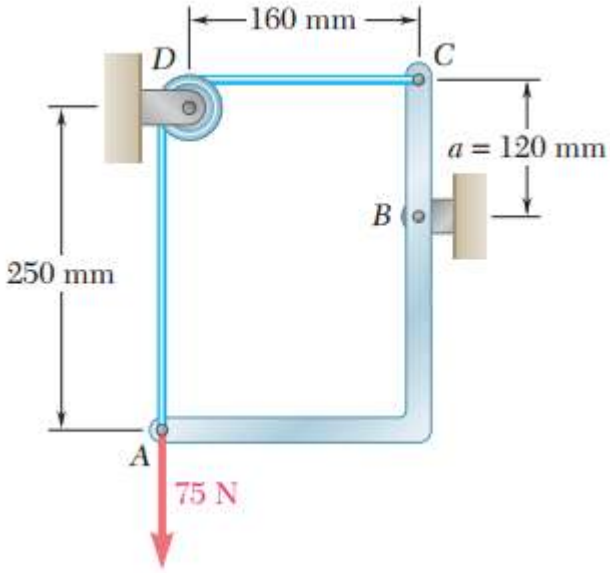
Problem 1B (15 Points)

Replace the loading by an equivalent resultant force and couple moment acting at point O.



Problem 2A (10 Points)

Member ABC is supported by a pin at B and an inextensible cable at A and C. The cable is passing over a frictionless pulley at D. For the loading shown and neglecting the size of the pulley, determine the tension in the cable at A and C and the reactions at B.

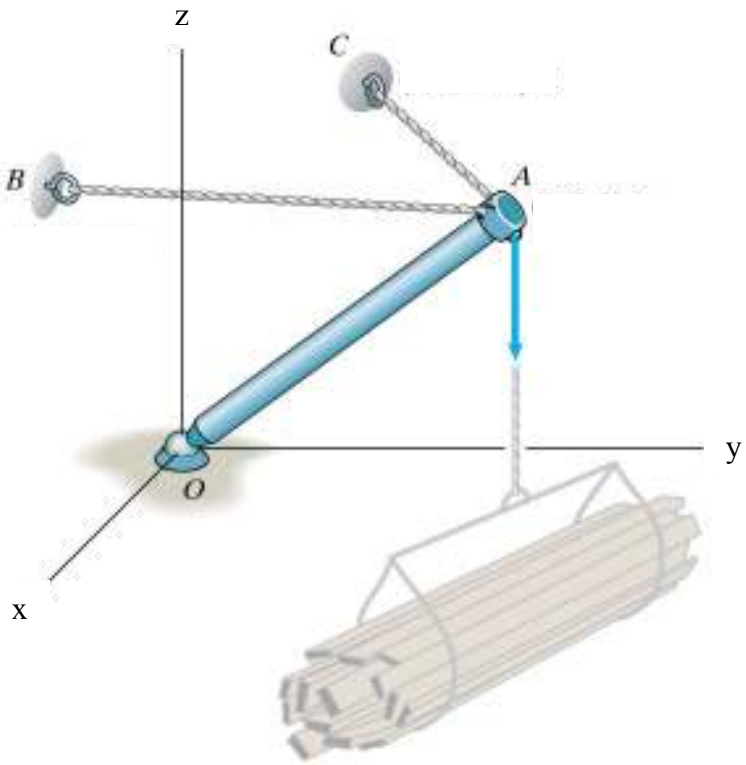


Problem 2B (15 Points)

The uniform bar OA weighs 200 N and supports a load of 600 N. Assume that the bar's weight acts at its mid-point. Formulate equilibrium equations required to determine the tension in the cables AC and AB and the reactions at the ball and socket support O. **Do not solve the equations.**

Note:

O (0, 0, 0); A (0, 8, 6); B (4, 0. 10); C (-10, 0, 6)



Problem 3 (25 Points)

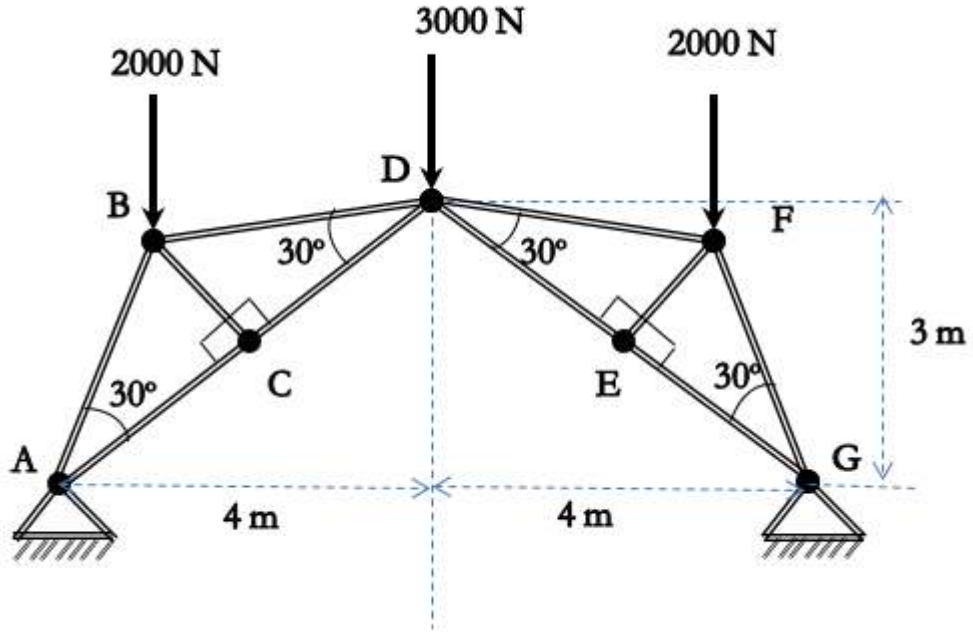
The truss shown below is supported by two pins at A and G.

(3 Points) 1. Identify zero-force members **by inspection (Negative marks for wrong answers)**

(12 Points) 2. Determine the support reactions at A and G

(5 Points) 3. Determine forces in members AB and AC by **Method of Joints**

(5 Points) 4. Determine forces in members BD and CD by **Method of Sections**



Problem 4 (25 Points)

The frame shown below is composed of 3 members (ABCD, GFCE and BC) and supported by pins at A and G. Determine the reactions at the pins A, G, B, F, E and the smooth slot at C.