



## College of Engineering & Technology

Department : Basic and Applied Sciences.

Examinars : Prof. Dr. Mohamed Abbasi and the staff.

Course : Engineering Mechanics ( 1 )-Statics.

Course Cod : BA141

Final Exam.

Date : 9- 1 - 2013

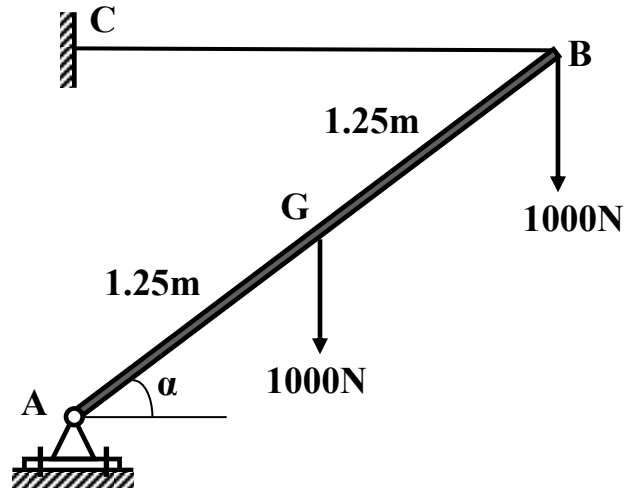
Marks : 40

Time : 2 Hrs.

**Answer the following questions:**

**Question(1):(6-Marks):**

Rod AB is pin supported at A and it is attached to a horizontal cord BC. Determine the reaction at A and the tension in the cord in the shown equilibrium position. ( $\tan\alpha = 0.75$ ).

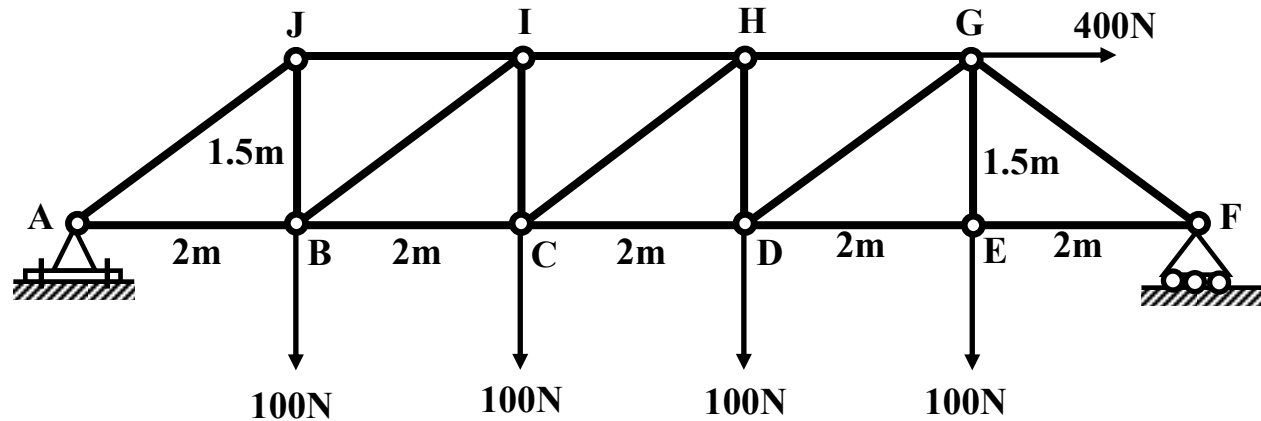


**Question(2): (8-Marks):**

For the shown truss, determine:

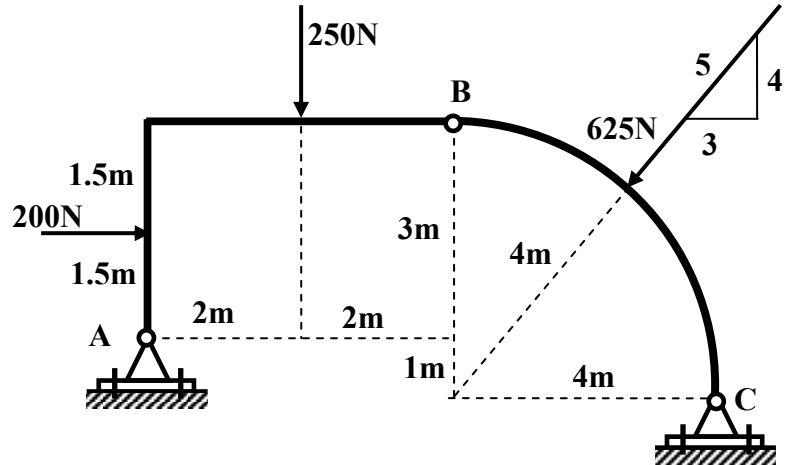
a-the reactions at each of the pin A and the roller support F.

b-the force in each of the members : HG,HD and CD. Indicate if the members are in tension or compression.



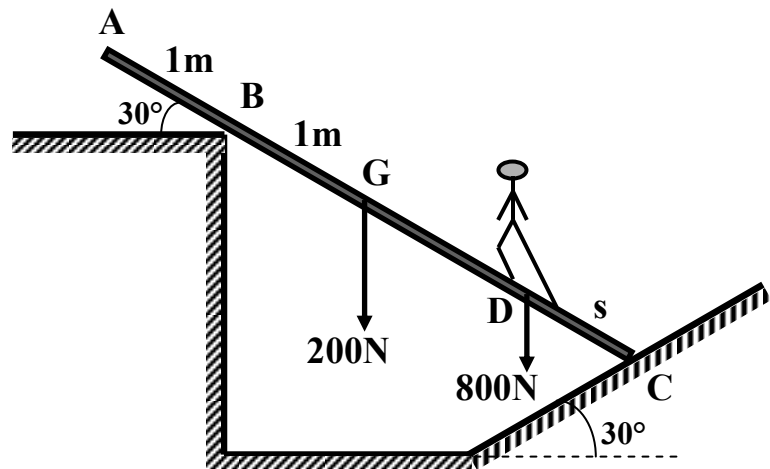
**Question(3): (10-Marks):**

For the shown frame, determine the reactions of each of the pins A, B, and C.



**Question(4): (8-Marks):**

The 200N uniform plate ABC is placed across the channel as shown and a 800N man attempts to walk across. If the coefficient of static friction at B and C is 0.2, determine how far a distance s will he walk from C before the plate slips.



**Question(5): (8-Marks):**

The pendulum consists of a slender rod AB of 30-kg mass and a thin uniform rectangular plate of mass 8 kg/m<sup>2</sup> which are rigidly connected. If a hole of radius 0.5m is made in the plate, determine the mass moment of inertia of the pendulum about an axis perpendicular to the page and passing through A.

$$I_{G.ROD} = \frac{mL^2}{12}, I_{G.RECTANGLE} = \frac{m(a^2+b^2)}{12}$$

$$I_{G.DISK} = \frac{1}{2}mR^2.$$

