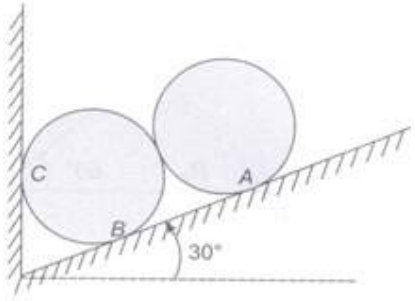
Code No: R21031 **R10** SET - 1

**II B. Tech I Semester Supplementary Examinations, Dec - 2015**
**ENGINEERING MECHANICS**
(Com to ME, AE, AME, MM)

Time: 3 hours Max. Marks: 75

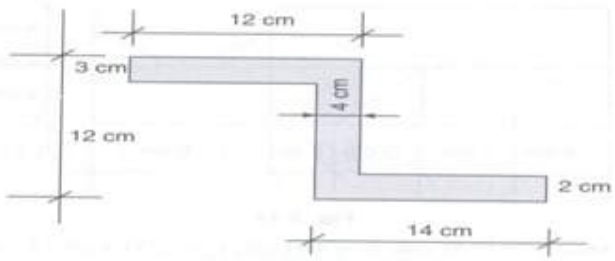
Answer any **FIVE** Questions
All Questions carry **Equal** Marks
~~~~~~~~~~~~~~~~~~~~~~~~~~~~

1. a) Which theorem is used for the equilibrium of a particle applied with the three coplanar, concurrent forces? State and prove. (5M)
   b) Two identical rollers, each of weight 300N are supported by an inclined plane and a vertical wall as shown in the fig.2.Determine the reactions at the points of supports A, B and C assuming all the surfaces to be smooth. Also, find the reaction forces between the spheres. (10M)



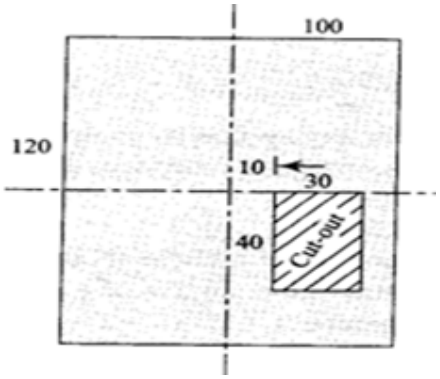

2. a) Define the terms coplanar forces, concurrent forces, like parallel forces and unlike parallel forces. (5M)
   b) Define and explain the moment of force. Differentiate between clockwise moment and anticlockwise moment. (10M)

3. a) State and prove theorems of Pappus I and II. (7M)
   b) Locate the CG of the figure given below (8M)


~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Code No: R21031 **R10** SET - 1

4. a) State and prove the theorem of parallel Axes. (7M)
   b) Find the moment of inertia of the shaded area given below (8M)

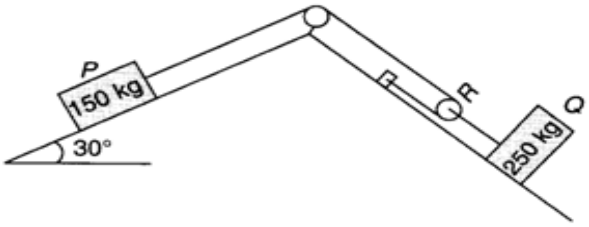



5. a) Analyse the frame given below by method of sections (10M)


   b) What are the assumptions for forces in members of a perfect frame? (5M)

6. a) Derive the equation $S = ut + 1/2\ at^2$ (7M)
   b) Derive the tension in the cables supporting a lift,when lift is moving up. (8M)

7. a) Find the tension in the string shown in the figure (8M)




   b) Derive work energy equation of translation. (7M)

8. a) For t The system of connected bodies shown in fig., determine the velocity and distance moved by each block 12 sec after release from rest and the tension in the string. Blocks A and B are 120N and 240N respectively. The coefficient of friction between block A and the contact surface is 0.26. (12M)


   b) Write the laws of friction. (3M)