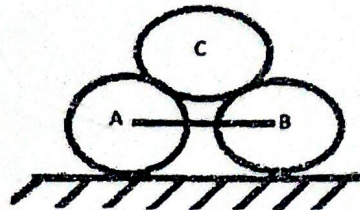


Exam.	New Back (2066 & Later Batch)		
Level	BE	Full Marks	80
Programme	BCE, BGE, BME	Pass Marks	32
Year / Part	I / II	Time	3 hrs.

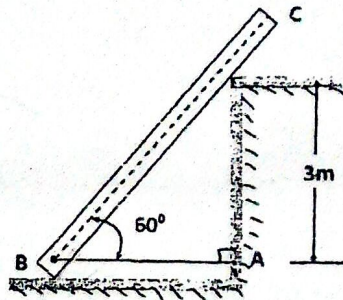
Subject: - Applied Mechanics (CE451)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.

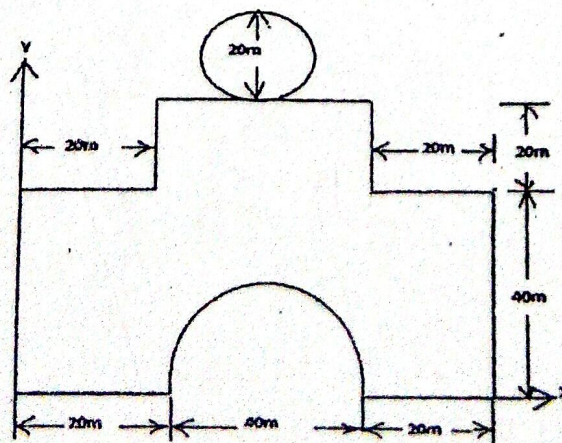
1. What is Mechanics? Define Rigid body and Deform body. [3]
2. Two smooth spheres of weight 100 kg each are connected at their centers by a string AB of length 40 cm, and supported third smooth sphere of weight 200 kg. Find the force in string AB and other contact surfaces. Radius of all spheres are 15cm. [8]



3. Define principle of transmissibility and explain about its drawback. Determine the tension in the cable AB which holds a post BC of 4m length from sliding. The post has a mass of 9 kg. Assume all the contact surfaces are smooth. [4+8]

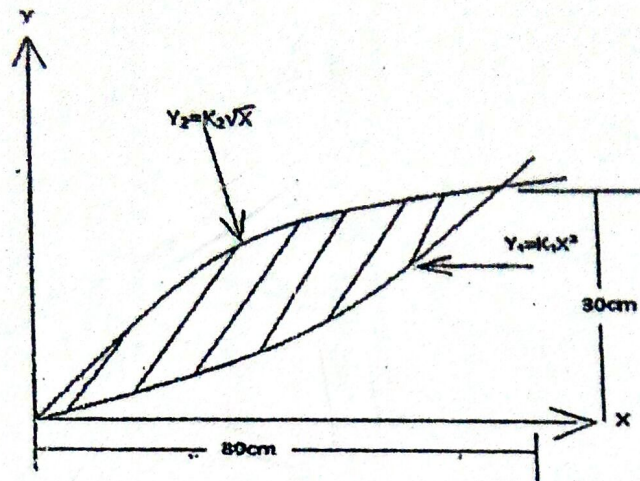


4. a) Locate the centroid of the given plane lamina. [6]



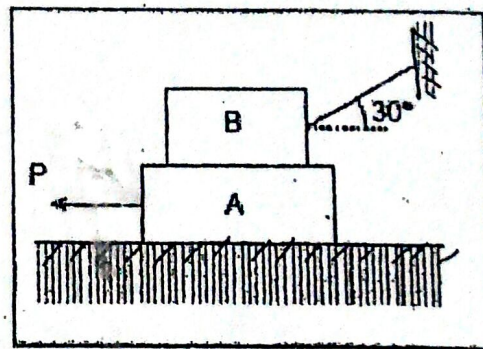
b) Find the moment of inertia of the given figure about centroidal X-X axis.

[6]



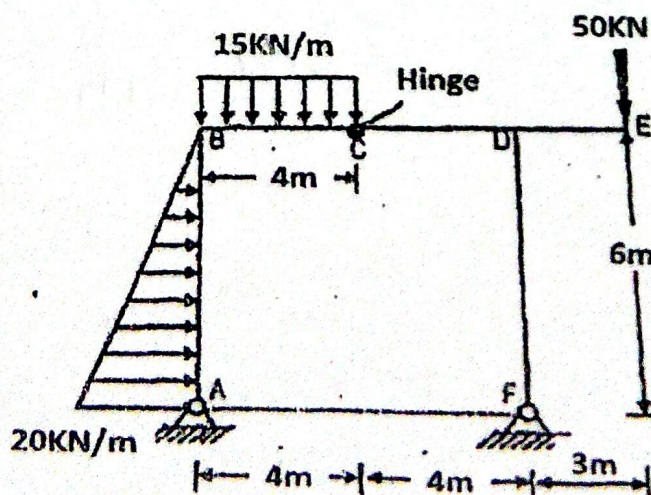
5. Two blocks A and B of 40 N and 20 N respectively are in equilibrium position as shown in figure. Calculate the force P required to move block A. Take $\mu_s = 0.3$ for all surface.

[4]

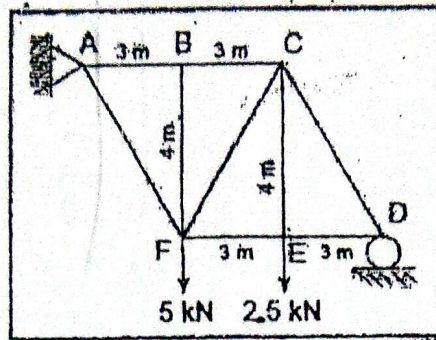


6. Draw Axial force, Shear force and Bending Moment diagram for the given frame structure shown in figure below. Also indicate the salient features if any.

[13]



7. Determine the force developed in the members BC, BF, FE and FC of the given truss. [8]



8. Describe the Position, Velocity and Acceleration of particle when it follows straight line path. A projectile is fired from position A with an initial velocity of 245 m/sec at a target B in right located 600 m above from the position A and the horizontal distance between positions A to target B is 3200 m. Neglecting air resistance, determine the value of firing angle. [2+8]

9. Two blocks shown in figure. The pulleys are frictionless and having no mass. The static and kinetic coefficient of friction between the block A and inclined plane are 0.35 and 0.25 respectively. Determine the acceleration of each block and tension in each chord. Explain about the dynamic equilibrium. [8+2]

