

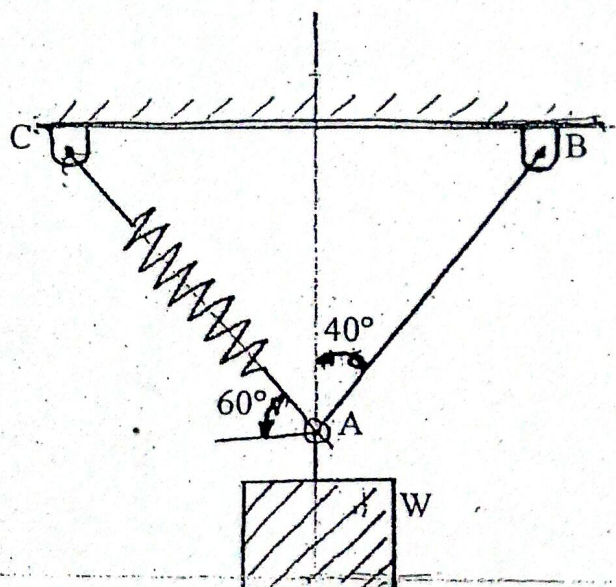
Exam.	Regular (2066 & Later Batch)		
Level	BE	Full Marks	80
Programme	BCE, BME	Pass Marks	32
Year / Part	I / II	Time	3 hrs.

Subject: - Applied Mechanics (CE 401)

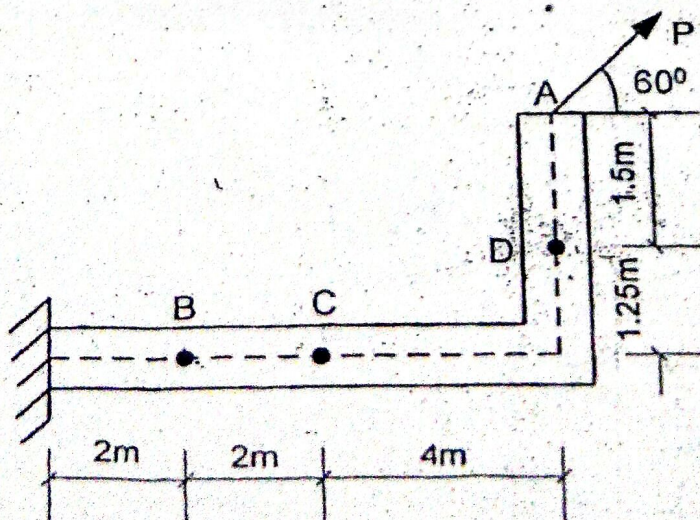
- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.

1. Differentiate between rigid body and deformable body. [3]

2. A container of weight W is subjected from ring A to which cable AB and spring AC are attached. The constant of spring is 100N/m and its unstretched length is 3m . Determine the tension in the cable; when (a) $W = 120\text{N}$ (b) $W = 160\text{N}$. [8]

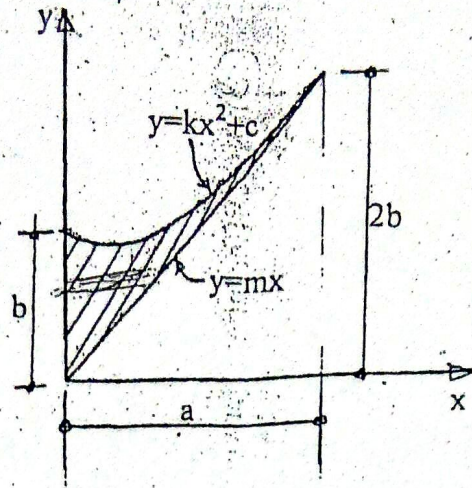


3. A 160N force P is applied at point A of a structural member. Replace P with (a) An equivalent force-couple system at C , (b) and equivalent system consisting of a vertical force at B and a second force at D . [12]



4. Determine the polar moment of inertia and the polar radius of gyration of the shaded area as shown in figure below with respect to centroid.

[12]

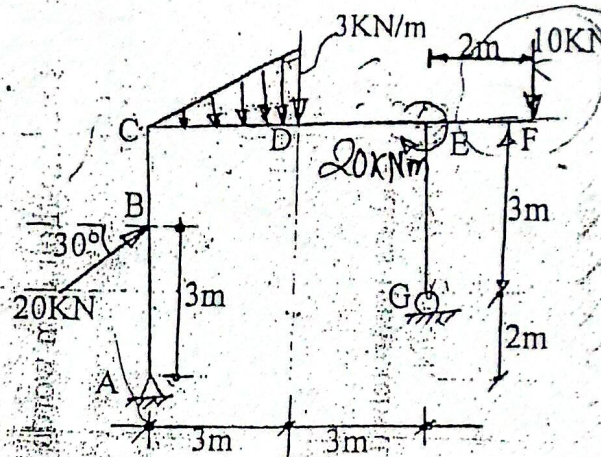


5. Define static friction. Explain why coefficient of static friction is always less than that of kinetic friction coefficient. Support your answer with relevant equations.

[1+3]

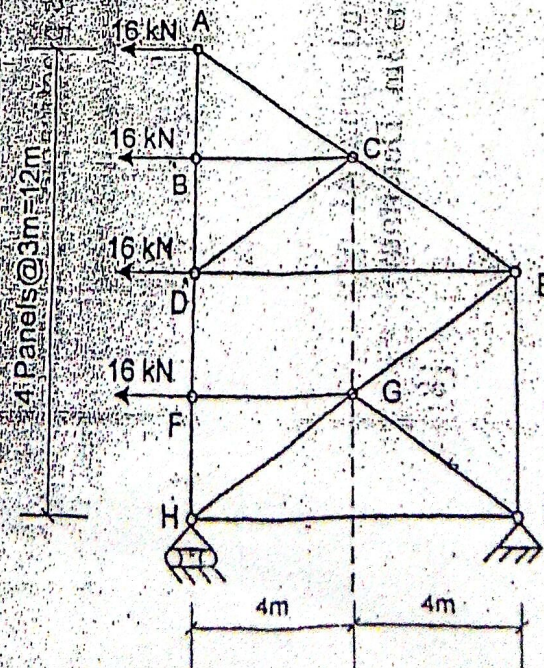
6. Calculate and draw the axial force, Shear force and bending moment diagram with its salient features; for the given frame as shown in figure below.

[13]



7. Use method of section to determine member forces DE, DF and GI for the given pin jointed truss and also indicate the nature of forces.

[8]



8. A particle moving in a straight line has an acceleration, $a = \sqrt{v}$, its displacement and velocity at time $t = 2$ sec, are $\frac{128}{3}$ m and 16 m/s. Find the displacement velocity and acceleration at time $t = 3$ sec.

[10]

9. The two blocks as shown in figure below are released from rest when $r = 0.73$ m and $\theta = 30^\circ$. Neglecting the mass of the pulley and the effect of the friction in the pulley and between block A and the horizontal surface. Determine:

- The initial tension in the cable
- Acceleration of the block 'A' and 'B'

[10]

