

21 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division

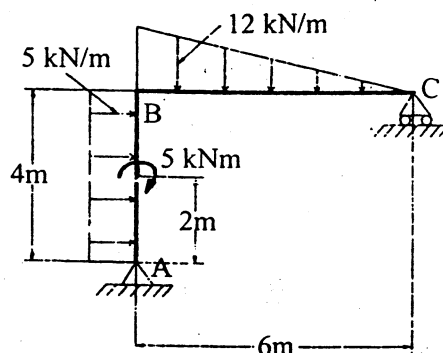
2068 Baishakh

Exam.	Regular / Back		
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT, BIE, B.Agric., B.Arch.	Pass Marks	32
Year / Part	I / I	Time	3 hrs.

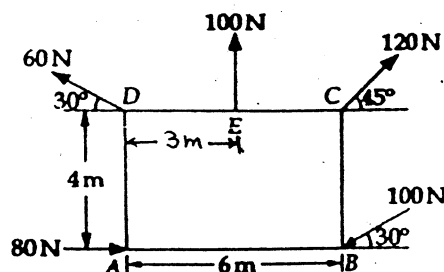
Subject: - Applied Mechanics

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

1. a) Derive the relationship between load, shear force and bending moment. [4]
- b) Draw axial force, shear force and bending moment diagram for the given loaded frame as shown in figure below. [12]



2. a) What is the equilibrium of a body? Write the conditions of equilibrium of a particle. [4]
- b) A plate of size $6\text{m} \times 4\text{m}$ is acted upon by a set of forces in its plane as shown in figure below. Determine the magnitude, direction and position of resultant force. [12]

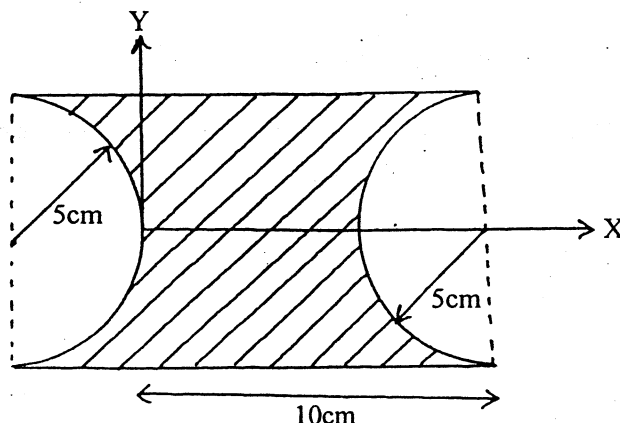


3. a) Determine the centroid of right angle triangle by method of integration. [6]

- b) Find the moment of inertia and radius of gyration about X-Y axis of the figure shown below.

[10]

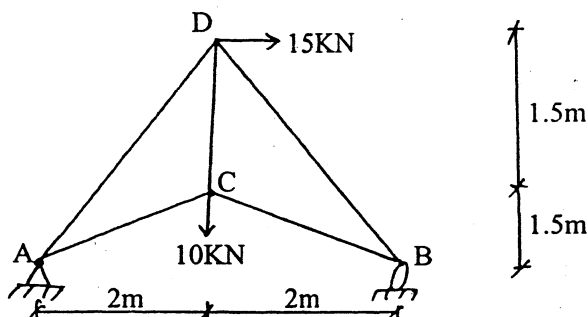
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4. a) What is the angle of friction? Explain about tipping and sliding of block?
b) Determine the support reactions and forces in all member in the given pin jointed truss as shown in figure below.

[6]

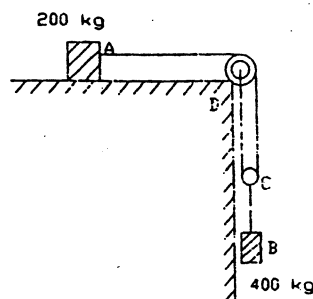
[10]



5. a) What is the linear momentum? Explain about rate of change of it.
b) Two blocks shown in figure below start from rest. The horizontal plane and the pulleys are frictionless, and the pulley is assumed to be of negligible mass. Determine the acceleration of each block and the tension in each rod.

[4]

[12]



6. a) Mention the types of support on structures and support reactions with its free body diagram.
b) For a particular body moving rectilinearly, $a = -10x^{-2}$, where a is the acceleration in m/sec^2 and x is in meter units. It is known that when $t = 2$ sec, $x = 8m$ and $v = 3m/sec$.
- Determine its acceleration when $t = 3$ sec.

[6]

[10]
