01 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2067 Mangsir

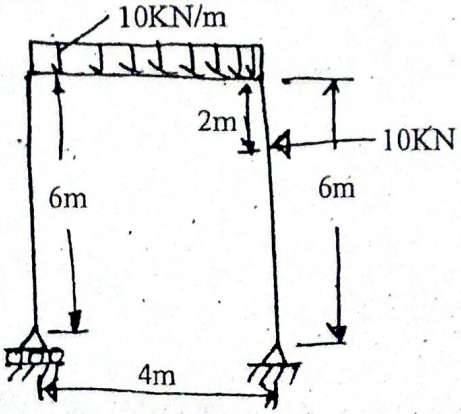
Exam.	Regular / Back		
Level	BE	Full Marks	80
Programme	BCE, BME	Pass Marks	32
Year / Part	I / II	Time	3 hrs.

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.*

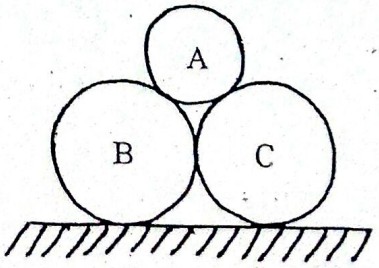
1. a) Write the principle of transmissibility and define couples with suitable examples. [4]

   b) Draw axial force, shear force and bending moment diagram for the frame shown in figure below. [12]



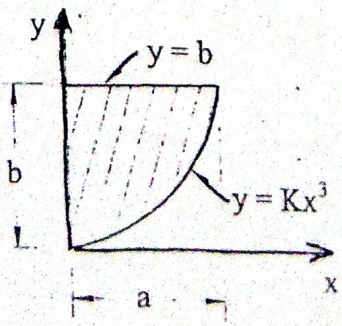
2. a) State and prove parallel axis-theorem for moment of inertia. [6]

   b) Find the contact forces of the three bodies as shown in figure below. Body A has 20cm diameter and 60N weight and bodies B and C have 30cm diameter and 100N weight each. [10]



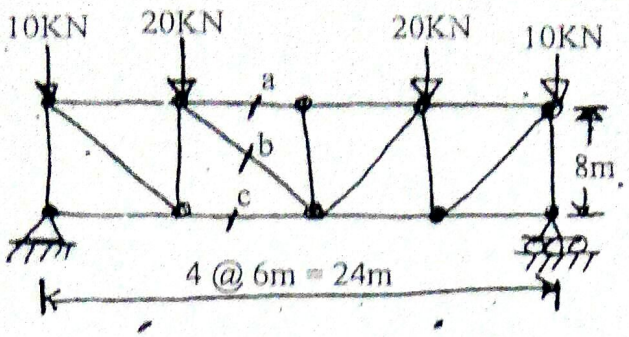
3. a) Define limiting friction, angle of friction and coefficient of static and dynamic friction. [6]

   b) Determine by direct integration the centroid of the shaded area as shown in figure below. [10]



4. a) Explain free body diagram with suitable examples. [6]

b) Find bar forces in members a, b and c in the truss as indicated in figure below. Shown loads are vertical at the joints. [10]

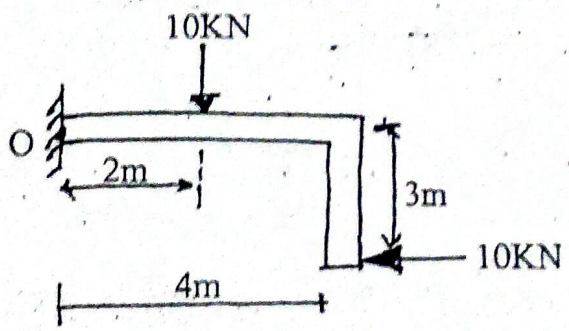


5. a) Explain the relationship between position, velocity and acceleration of a particle in rectilinear motion. [6]

b) A ball is thrown vertically upward with a velocity of 25 m/sec. After 2 second another ball is thrown with the same velocity. Find the height at which the two ball pass each other. [10]

6. a) State Newton's second law of motion and derive the relation between linear momentum and force. [6]

b) Resolve the force system as shown in figure below into an equivalent force-couple system about O. [10]



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