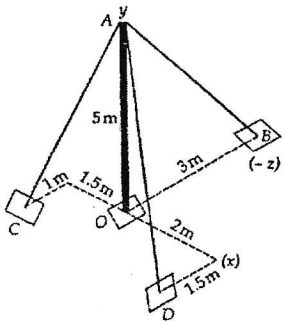
TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2076 Ashwin

Exam.	Back		
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT, BAM, BIE, BAG, BAE, BAS	Pass Marks	32
Year / Part	I / I	Time	3 hrs.

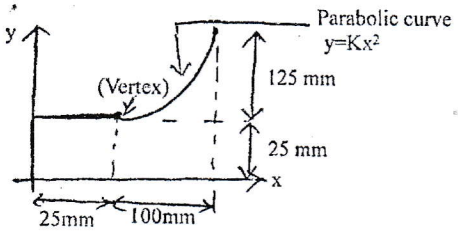
Subject: - Applied Mechanics *(CE 401)*

- ✓ 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.*

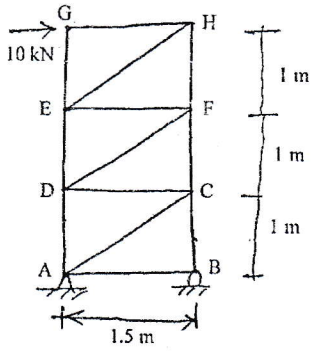
1. Define the terms Rigid body and particles. [2]
2. What do you understand by Free Body Diagram? Explain with sketches. What is the physical significance of static equilibrium? [4+4+2]
3. In the system shown in figure, a 5m long pole is held in vertical position by three guy wires AB, AC and AD. If the tension of 600 N is induced in AD and the resultant force at A is to be vertical, determine the tension in cables AB and AC. [8]



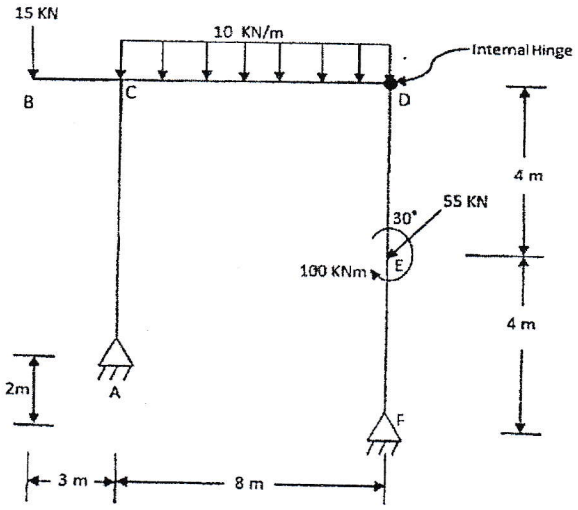
4. What are the characteristics of couple? [4]
5. What are the uses of friction in engineering field? [2]
6. Determine the centroid of the following composite figure. [10]



7. Analyze the following pin-jointed frame regarding the members AD, DC, DF, ED and FC, using Method of Moment. [10]



8. Draw axial force, shear force and bending moment diagram of the given frame. Indicate salient features if any. [14]

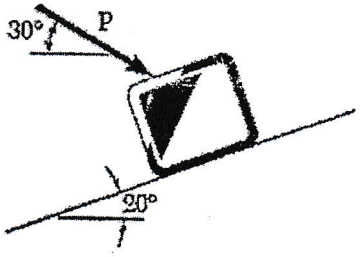


9. What do you mean by dependent motion, explain with example? [2+8]

A projectile is fired from the top of a 30 m high building with an initial velocity of 45 m/s at an angle of 35° with the horizontal. Neglecting air resistance, find

a) the greatest elevation above the ground,
b) the horizontal distance from the point of projection to the point where the projectile strikes the ground
c) the velocity with which it strikes

10. Define principle of impulse momentum for particle. A 20-kg package is at rest on an incline when a force P is applied to it. Determine the magnitude of P if 10 s is required for the package to travel 5 m up the incline. The kinetic coefficients of friction between the package and the incline is equal to 0.3. [2+8]



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