

11 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division

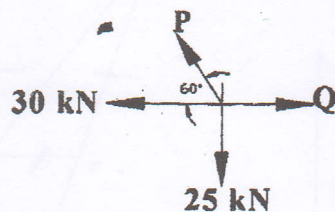
2074 Chaitra

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

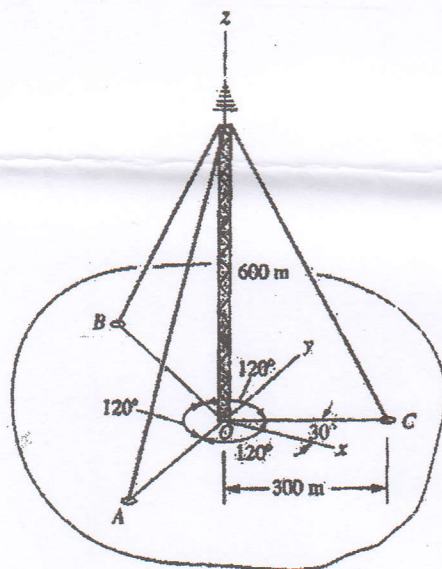
Subject: - Applied Mechanics (CE401)

- ✓ 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. Explain in brief about fundamental concepts and principles of mechanics. [3]
2. What do you understand by Free Body Diagram? Explain with sketches. Also state Varignon's Theorem and prove it. [4+4]
3. Determine the values of the unknown forces P and Q for the system of forces to be in equilibrium. [4]

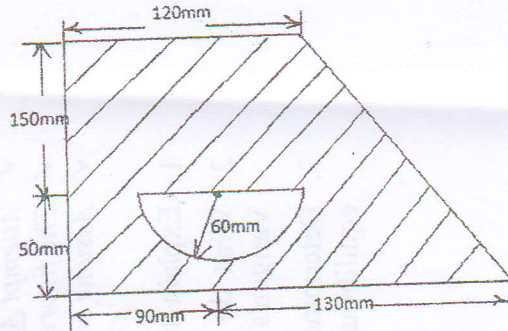


4. Three guy wires are used in the support system for a television transmission tower that is 600m tall. Wire A and B are tightened to a tension of 60KN, whereas wire C has only 30 KN of tension. What is the moment of wire forces about the base O of the tower? The Y axis is collinear with AO. [7]



5. State and prove parallel axis theorem for moment of inertia. Determine moment of inertia about centroidal axes of the plane figure shown in below.

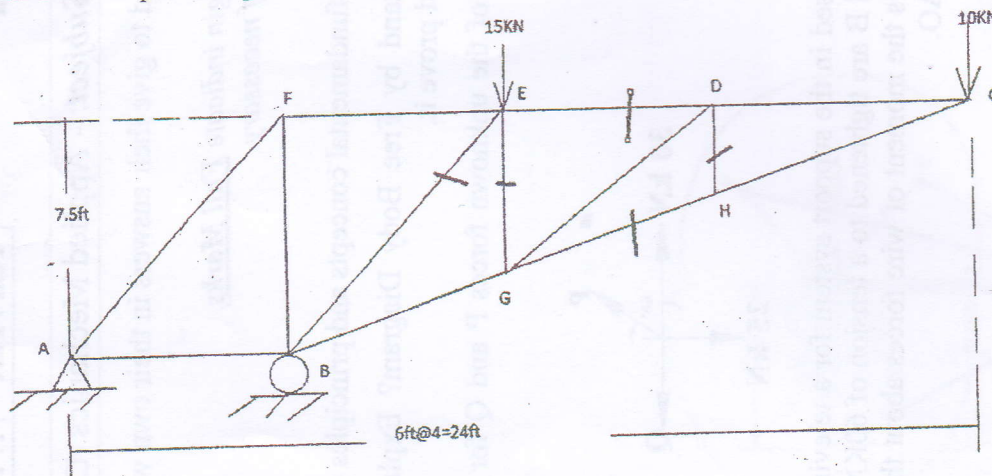
[4+8]



6. Define limiting friction, angle of friction and coefficient of the static and dynamic friction.
7. Find the member forces of indicated members of the truss shown in figure below. Write down the assumptions of perfect truss.

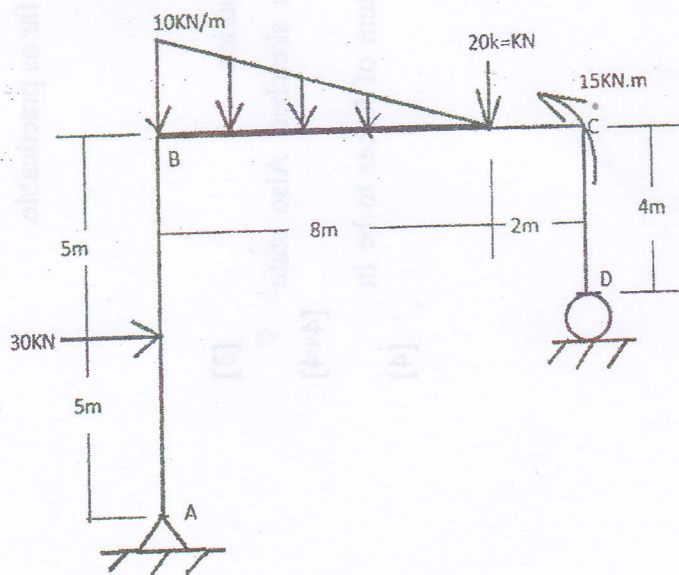
[4]

[5+4]

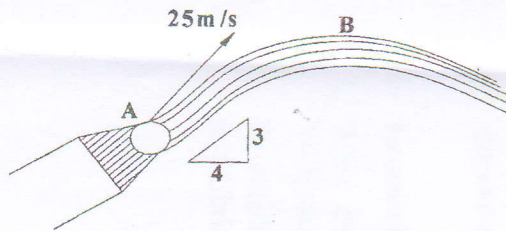


8. Draw axial forces, shear force and bending moment diagram and indicate the salient features if any for the given frame loaded as shown in figure below.

[13]



9. Derive the relationship for normal and tangential components of acceleration for a particle moving in a curvilinear path. A nozzle discharge a stream of water in direction as shown in figure below with an initial velocity of 25m/sec. Determine the radius of curvature of the stream (i) as it leaves the nozzle (ii) at the maximum height of the stream. [4+6]



10. Determine the acceleration of block "A" for the system, if the system starts from rest. Coefficient of friction between block "A" and table is 0.25 and that between blocks "A" and "B" is 0.35. Where weight of block A, B and C are 100 N, 50 N and 500 N respectively. [10]

