TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division

2076 Chaitra

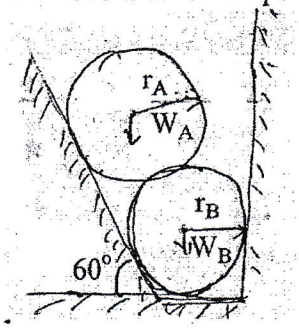
Exam.	Regular		
Level	BE	Full Marks	80
Programme	BEL, BEX, BEI, BCT, BAM, BIE, BAG, BAR, BAS	Pass Marks	32
Year / Part	I / I	Time	3 hrs.

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.*

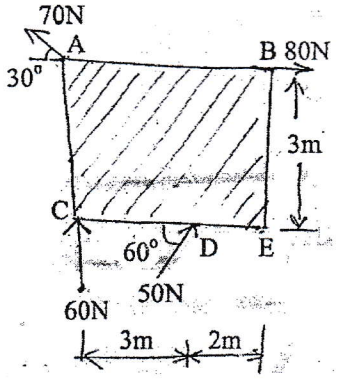
1. What are the equations of static equilibrium for 2D and 3D analysis of particle and rigid body? Define free body diagram with examples. [4+2]

2. Find the reactions at contact points of Ball A and Ball B. [7]

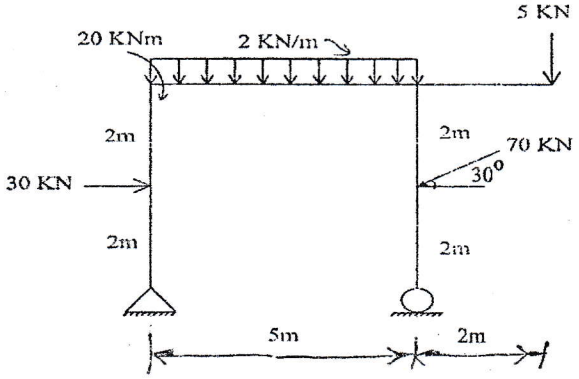


$W_A = 50N$, $W_B = 40N$
$r_A = 10cm$, $r_B = 8cm$

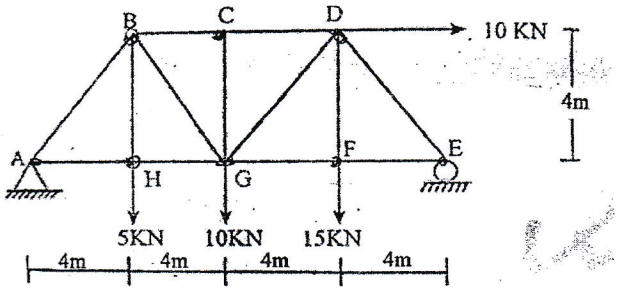
3. Define Applied Mechanics and concept of rigid & deformed body. Find the magnitude, direction and line of action of the resultant force as shown in figure below. [2+7]



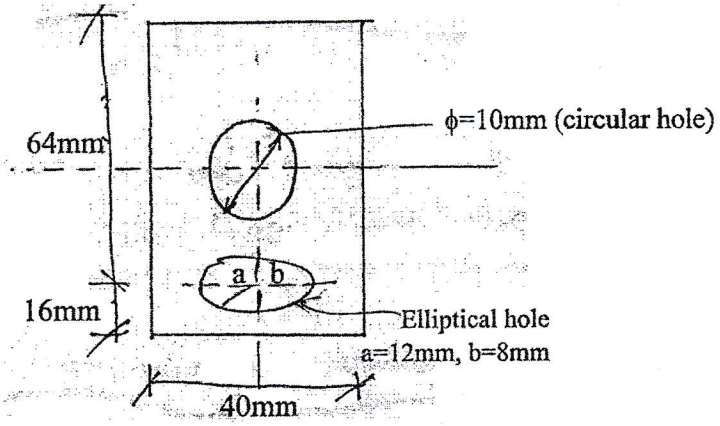
4. What do you mean by determinate and indeterminate structures? Draw AFD, SFD and BMD of the given frame loaded as shown in figure. Indicate the salient features if any. [2+12]



5. Calculate the force developed in member BC, BG, HG and GD of the truss loaded as shown in figure. Define determinate, stable, unstable structures. [5+2]



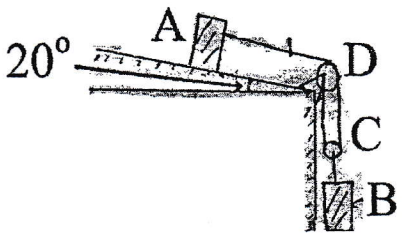
6. Find MOI about Centroidal XX and YY axes of the composite area. Define Centroid, Center of Gravity and axis of symmetry. [8+4]



7. What do you mean by friction? What are the laws of dry friction? Explain about static and kinetic friction. [1+2+2]

8. Define Kinematics and Kinetics of particle. A train runs at a speed of 120km/hr in a curved track of radius 900m the application of brake suddenly, causes the train to slow down at a constant rate. After 6 seconds the speed has been reduced to 72km/hr. Determine the acceleration immediately after the brakes is applied. [2+8]

9. Determine the acceleration of two block & tension in the wire when two blocks start form rest. There is no friction & no mass of pully. Coeff. of kinetic friction is 0.4 and m_A=100kg and m_B=300kg. What do you mean by impulse momentum principle and dynamic equilibrium? [7+3]



***