Code: ME1T6, AE1T6

I B. Tech - I Semester – Regular/Supplementary Examinations
November 2017

ENGINEERING MECHANICS - I
(Common for ME, AE)

Duration: 3 hours   Max. Marks: 70

PART – A

Answer **all** the questions.   All questions carry equal marks

11 x 2 = 22 M

1.

a) State the principle of transmissibility.
b) What is meant by equilibrium of a system?
c) Distinguish between coplanar forces and concurrent forces.
d) What is the centroid of a quarter circle of radius 2m ?
e) State perpendicular axis theorem.
f) Write the basic assumptions for a perfect truss.
g) Explain the procedure for finding member forces using method of joints.
h) Give the classification of friction.
i) What is angle of repose and cone of friction?
j) What are the advantages of virtual work method?
k) What is meant by i) Work done ii) Virtual work.

PART – B

Answer any *THREE* questions. All questions carry equal marks.

$$3 \times 16 = 48 \text{ M}$$

2.a) Three bars, hinged at A and D and pinned at B and C as shown in figure-1 form a four-linked mechanism. Determine the value of P that will prevent movement of bars.   8 M
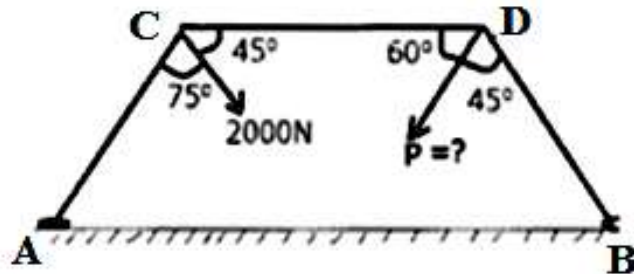

figure-1

b) Two men support a weightless wooden beam AB with a weight of 1000N hanging from the beam as shown in figure-2. Find the load shared by the each man.   8 M
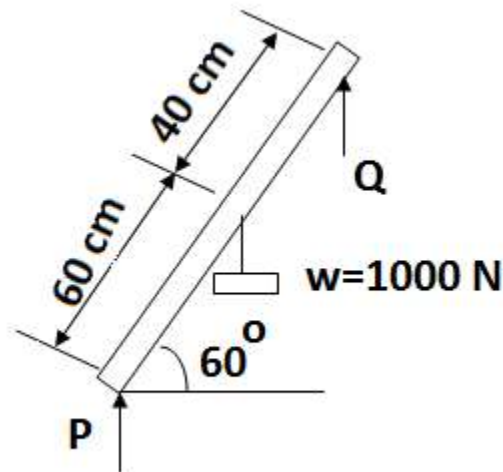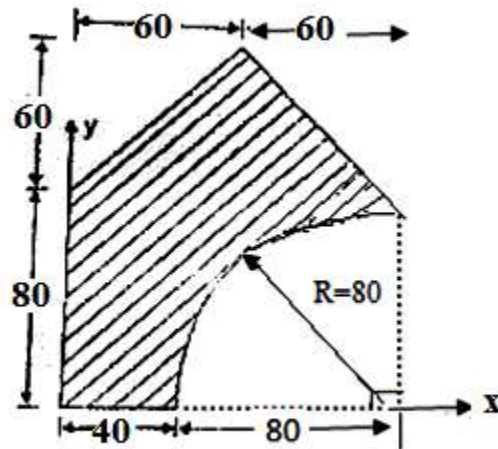

figure-2

3.a) Determine the centroid of a triangle by integration method.

6 M

b) Find the moment of inertia of the shaded area with respect
to the x and y axes shown in figure-3.   10 M

all dimensions are in mm

figure-3.

4. Find the forces in the members of the given truss shown in
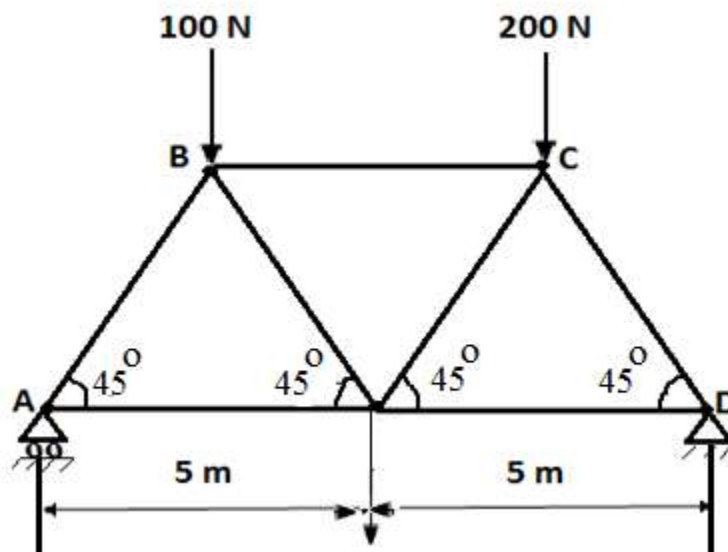figure-4.   16 M

figure-4.

5. Determine the force 'P' to cause motion to impend if the co-efficient of friction for both blocks and the plane shown in figure-5 is 0.25. Force developed in the ropes is parallel to the plane. The pulley is frictionless.   16 M
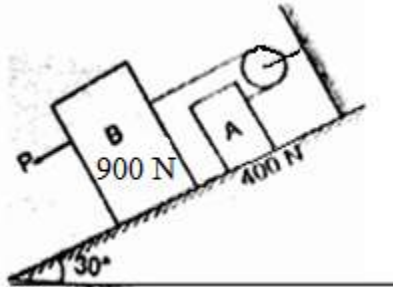

figure-5

6. Using the principle of Virtual work, Determine the reactions at A and B for the beam shown in figure-6.
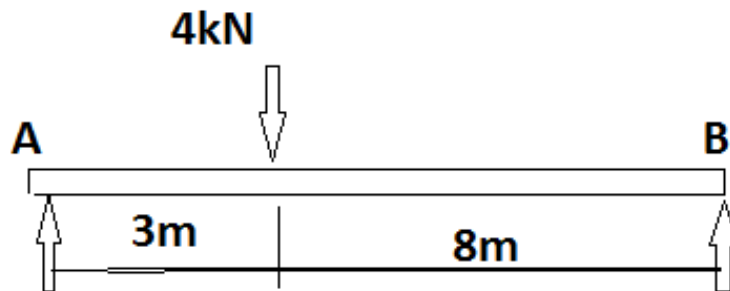

figure-6