

Bachelor of Mechanical Engineering

1st year 1st semester Supplementary (old) examination, 2018-19

Subject : Engineering Mechanics I

Time 3 hrs

Full Marks : 100

Answer any five questions :

1. (a) Refer to Fig A and find out the moment of the force about the base O.

(b) Refer to Fig B and replace the system of forces and moments acting on different sides of the cube (each side 10 cm) with a single force and moment to be applied at A.

10+10

2. (a) Refer to Fig C and draw free body diagrams of individual members and also of the overall structure.

(c) Refer to Fig D and find out the support reactions. Also find out the force developed at joint C.

10+10

3. (a) Refer to Fig E and find out the force needed to cause the upward motion of the upper block. Coefficient of friction for all surfaces is 0.25

(b) Refer to Fig F and find out the x and y coordinates of the centroid of the shaded area. Also find out the volume generated by revolving the area by 360 degree about Y axis.

10+10

4. (a) Refer to Fig G and find out the forces and nature of forces in all the members of the truss.

(b) Refer to Fig H and find out the area moment of inertia of the shaded area about XX axis.

10+10

5. Refer to Fig I and find out the support reactions and the tension in the cables.

20

6. write short notes on any four :

4 X 5=20

(a) Pappus Guldinus Theorem

(b) Free vector, sliding vector and fixed vector

[Turn over

(c) Two force member and three force member

(e) Product moment of inertia

(f) Coulomb's Laws of dry friction

