Bachelor of Power Engg., 1ˢᵗ Yr. 1ˢᵗ Sem. Supplementary Examination- 2017

Subject: Engineering Mechanics-I   **Time: 3 Hours**   **Full Marks: 100**

Answer any **five (5)** questions from the followings.   5 x 20 = 100

1. A circular roller of weight 100 N and radius 10 cm hangs by a string AB = 20 cm and rests against a smooth vertical wall at C as shown in the Fig. 1. Determine the force F in the string AB and normal reaction at C.

2. Referring to Fig. 2, where radius of roller is r = 12 cm, h = 6 cm and weight of the roller is 5000N. Find the magnitude of P required to start the roller over curb.

3. The system shown in Fig. 3 is in equilibrium with the string in the center exactly horizontal. Find (a) Tension T_1, (b) Tension T_2 (c) Tension T_3, (d) angle Θ

4. Determine the force P required to keep the two rods in equilibrium when the angle = 30° and weight W is 50 lb. The rods are each of length L and of negligible weight. They are prevented from moving out of the plane of the figure by supports not shown (Fig. 4).

5. Determine the centroid of the given section. (Fig. 5)

6. Write a short note on the followings.   5 x 4 = 20
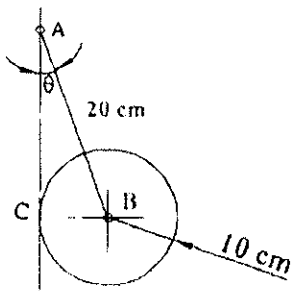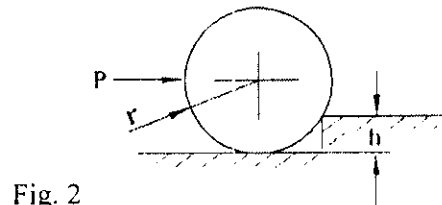(a) Laws of friction, (b) Lami's theorem, (c) center of gravity, (d) Principle of virtual work, (e) Angle of Repose
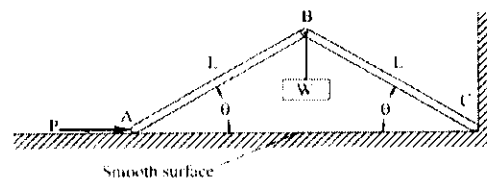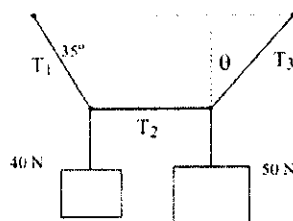

Fig. 1

Fig. 2

Fig. 4

Fig. 3

Fig. 5