SIES Graduate School of Technology

INTERNAL TEST I, AUGUST-2015

Branch: All

Class: F.E.

Subject: E.M.

Time: 1 hr

Max Marks: 20

Notes:

1. All questions are compulsory.

2. Figure to right indicate full marks.

Q1. Solve any five questions from six. *(2 Marks each)*

a. State Lami's theorem.

b. Draw FBD for the given loaded beam as shown in fig.1.

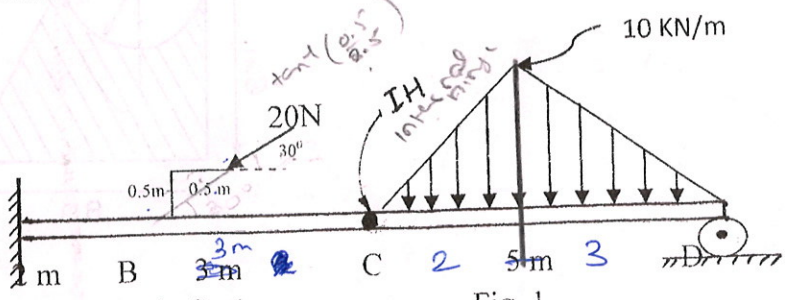


Fig. 1

c. Write the assumptions made in analysis of truss.

d. A circular roller of weight 1000 N and radius 20 cm is hung by a tie rod AB = 40 cm and rest against a smooth vertical wall at C as shown in the figure 3. Determine the tension in the rod.

e. States Varignon's theorem and principle of transmissibility.

f. Comment whether body (Fig 2) is in motion or stationary.

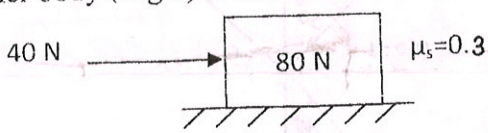


Fig. 2

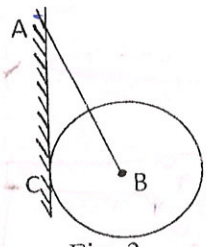
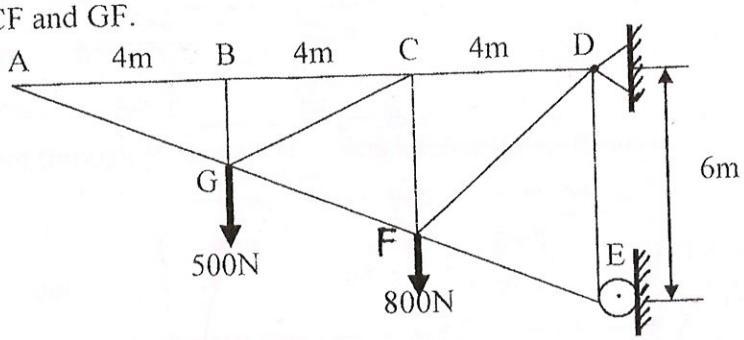


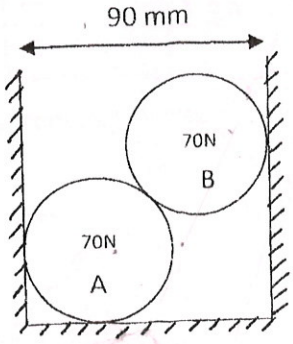
Fig. 3

Q2A) Identify zero force members with justification and also find the forces in the member CD. CF and GF. [5M]

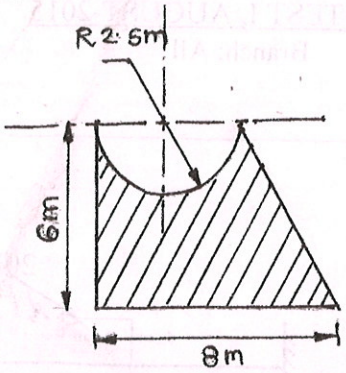


OR

Q2B) Two smooth identical spheres A and B weight 70N and radius 30 mm respectively are resting in a channel as shown in the figure. Find the reactions at the contact points. [5M]



Q3A. Locate the centroid of the shaded area as shown in the figure [5M]



OR

Q3B. A system of four forces as shown in the figure has resultant of 150 N along x axis. Determine the magnitude and direction of unknown force P. [5M]