

TUTORIAL SHEET-02 (EQUILIBRIUM OF FORCES-PART 1)

- Two smooth circular cylinders each of weight 1000 N and radius 15 cm, are connected at their centres by a string AB of length of 40 cm and rest upon a horizontal plane, supporting above them a third cylinder of weight 2000 N and radius 15 cm, as shown in Fig. 1. Find force in the string AB and the pressure produced on the floor at the points of contact D and E .
- A rod AB as shown in Fig. 2, is held by a ball and socket point at A and supports a mass C weighing 1000 N at end B . The rod is in x - y plane and is inclined to y -axis at an angle of 18° . The rod is 12 m long and has negligible weight. Find the forces in the cable DB and EB .
- Two weights are suspended from B and C points of a rope as shown in Fig. 3. If the distance AD is 6 m, how much will be the magnitude of W to maintain its equilibrium.
- Two spheres weighing, 60N and 100N, are connected by a flexible string AB , and rest on two mutually perpendicular planes PQ and QR (Fig. 4). Find the tension in the string which passes freely through slots in smooth inclined planes PQ and QR .
- A tower of 20 m height is supported by three ropes as shown in Fig. 5. If force in member AB is 50 N, find the force in AC and AD so that the resultant of these forces should be vertical.
- Blocks A and B have masses 400 kg and 200 kg, respectively and rest on 27° incline as shown in Fig. 6. Blocks are attached to a post by cords and the post is held fixed by action of force F . Assuming all contact surfaces smooth and cords parallel to incline, determine the value of F . Also determine the ground reaction.

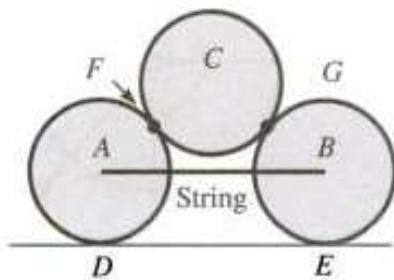


Fig. 1

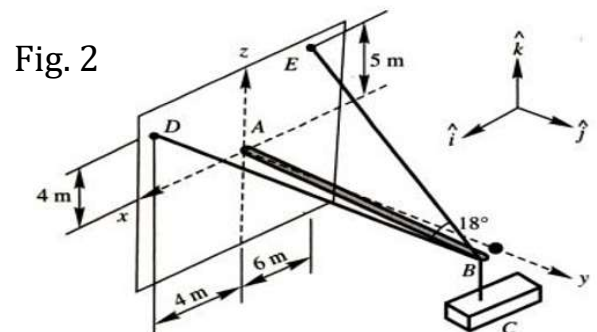


Fig. 2

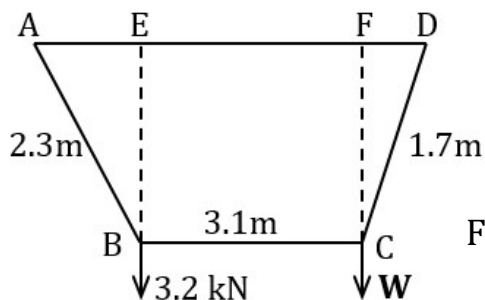


Fig. 3

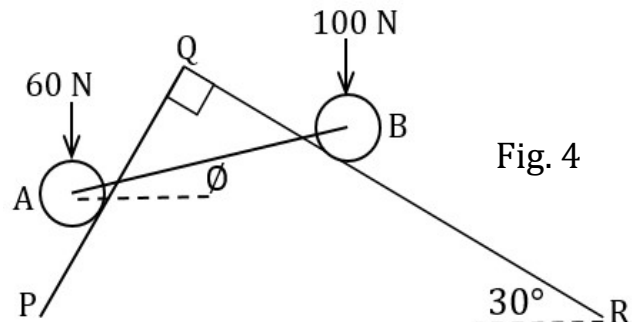


Fig. 4

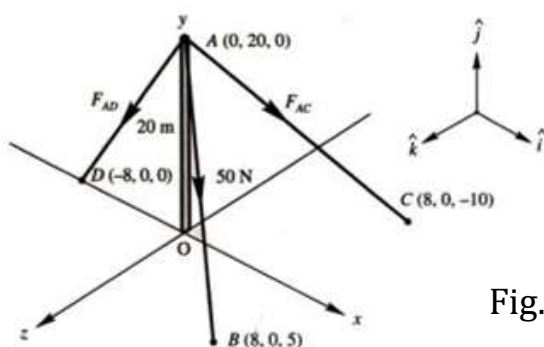


Fig. 5

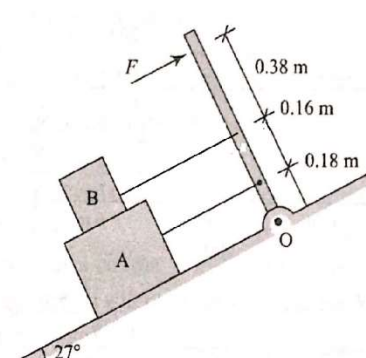


Fig. 6