

Fig. 1.

1. Two prismatic homogeneous bars AB and BC of length l and $2l$, respectively, are rigidly joined at B at right angles to each other, as shown in Fig. 1. In the suspended position shown, AB makes an angle α with the vertical string OA. If the resultant of the weight of the bars is along OA, determine α . (15%)

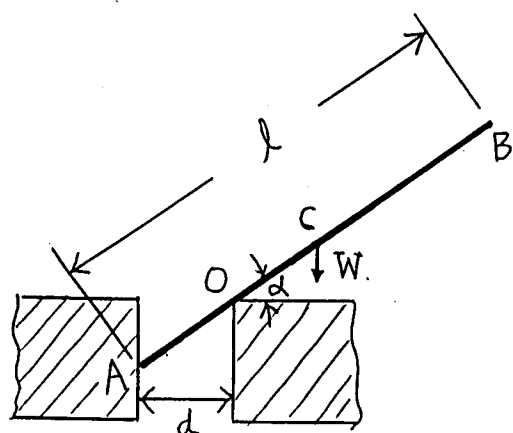


Fig. 2.

2. A bar AB of length l and weight W rests on the upper, smooth corner of a vertical wall at O, and its end A is stopped by a parallel, smooth wall (Fig. 2). Given that $AO < l/2$, determine the angle α and reactions at O and A. (15%)

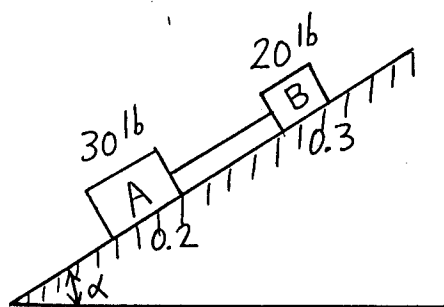


Fig. 3.

3. Two blocks A and B, connected by a link of negligible mass, are sliding down an inclined plane, as shown in Fig. 3. The sliding friction between A and the plane is 0.20 and between B and the plane is 0.30. Find the tension in the connecting link. (20%)

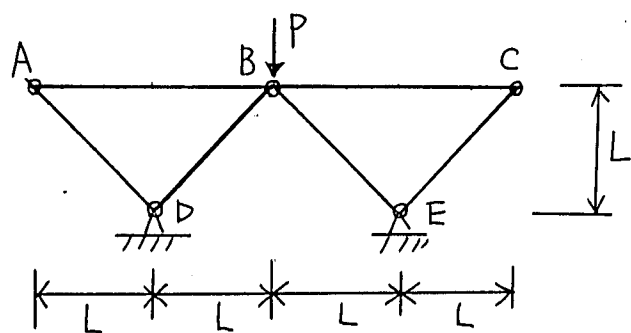


Fig. 4.

4. Determine the forces in the members AB and BE of the truss shown in Fig. 4. (15%)

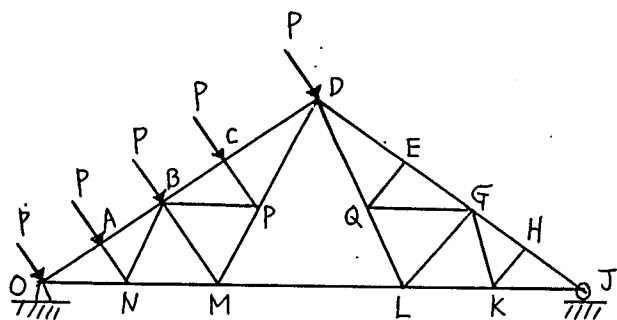
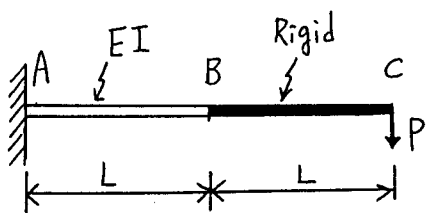


Fig. 5

5. Determine the zero-force members of the truss loaded as shown in Fig. 5. (20%)



6. BC is rigid while AB is flexible. Determine the deflection at point C. (15%)