**Department of Mechanical Engineering (NITC)**

**S1ME** **ZZ1001D ENGINEERING MECHANICS** **Tutorial Test 4-Set 2**

Time: One Hour Maximum Marks: 20

1. A block having a mass of 500 kg is held by five cables as shown in Fig. 1. What are the tensions in these cables? Lower cables are identical and are identically connected at ends.
2. **A** thin hoop of radius 1 m and weight 500 N rests on an incline (Fig. 2). What friction force *f* at *A* is needed for this configuration? What is the tension in wire *CB***?**

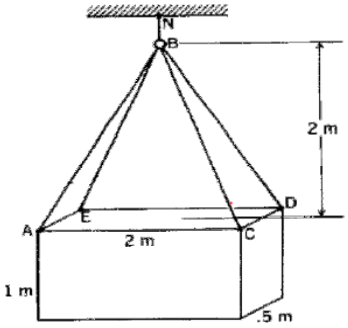


Figure 1

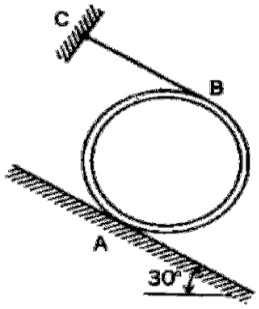


figure 2

----------**P.T.O**----------

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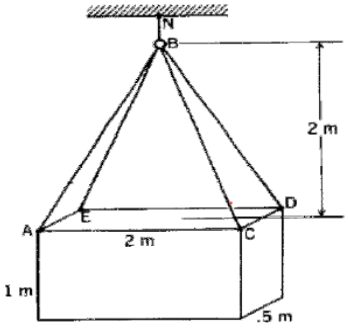


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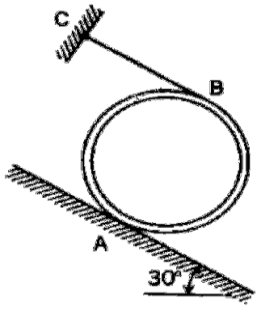


figure 2

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3. Two cables *GH* and *KN* support a rod *AB* which connects to a ball-and-socket joint support at *A* and supports a 500-kg body ***C*** at *B* (Fig. 3). What are the tensions in the cable and the supporting forces at *A*?
4. Draw the free-body diagram of the foot lever shown in Fig.4 . The operator applies a vertical force to the pedal so that the spring is stretched 1.5 in. and the force in the short link at *B* is 20 lb.

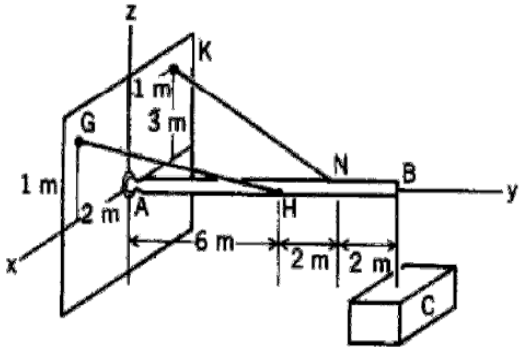
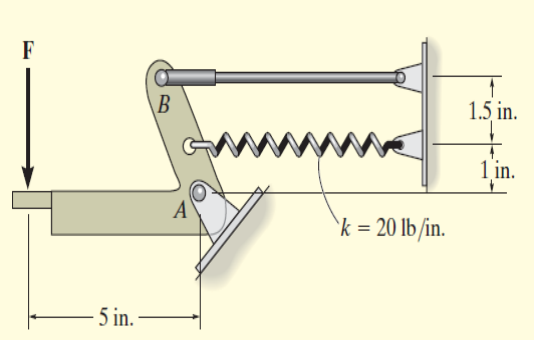



Figure 3

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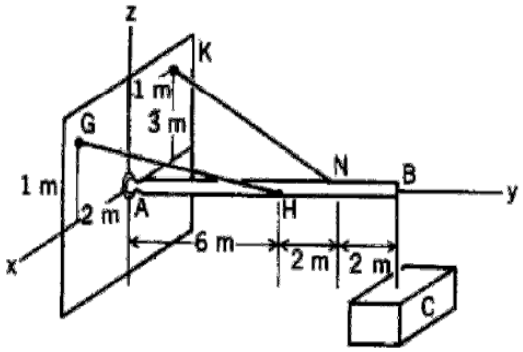


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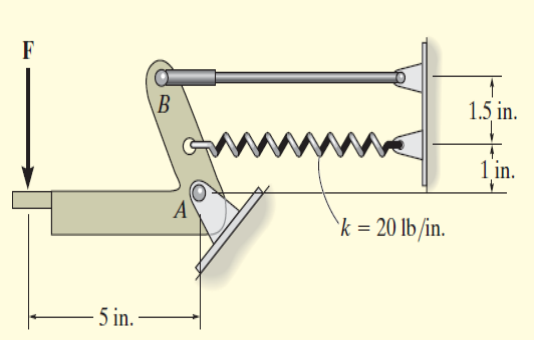


figure 4