

7.

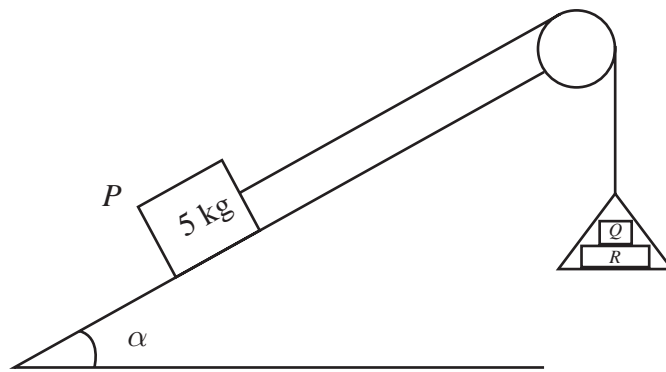


Figure 3

One end of a light inextensible string is attached to a block P of mass 5 kg . The block P is held at rest on a smooth fixed plane which is inclined to the horizontal at an angle α , where $\sin \alpha = \frac{3}{5}$. The string lies along a line of greatest slope of the plane and passes over a smooth light pulley which is fixed at the top of the plane. The other end of the string is attached to a light scale pan which carries two blocks Q and R , with block Q on top of block R , as shown in Figure 3. The mass of block Q is 5 kg and the mass of block R is 10 kg . The scale pan hangs at rest and the system is released from rest. By modelling the blocks as particles, ignoring air resistance and assuming the motion is uninterrupted, find

- (a) (i) the acceleration of the scale pan,
- (ii) the tension in the string, (8)
- (b) the magnitude of the force exerted on block Q by block R , (3)
- (c) the magnitude of the force exerted on the pulley by the string. (5)



