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A rectangular block B is at rest on a horizontal surface. A particle P of mass 2.5 kg is placed on the upper surface of B. The particle P is attached to one end of a light inextensible string which passes over a smooth fixed pulley. A particle Q of mass 3 kg is attached to the other end of the string and hangs freely below the pulley. The part of the string between P and the pulley is horizontal (see diagram).

The particles are released from rest with the string taut. It is given that B remains in equilibrium while P moves on the upper surface of B. The tension in the string while P moves on B is 16.8 N.

(a) Find the acceleration of Q while P and B are in contact. **[2]**

(b) Determine the coefficient of friction between P and B. **[3]**

(c) Given that the coefficient of friction between B and the horizontal surface is $\frac{5}{49}$, determine the least possible value for the mass of B. **[3]**