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Section A

Answer **all** the questions in this Section in the spaces provided.

1 A student is exploring Physics principles with wooden blocks and some Physics activities.

(a) Fig. 1.1 shows the first experiment with block A attached to a frictionless pulley using an inelastic massless string. Block A accelerates up a frictionless inclined plane of angle 50°. Block B of mass 8.3 kg is attached to the string on the opposite end of the pulley.

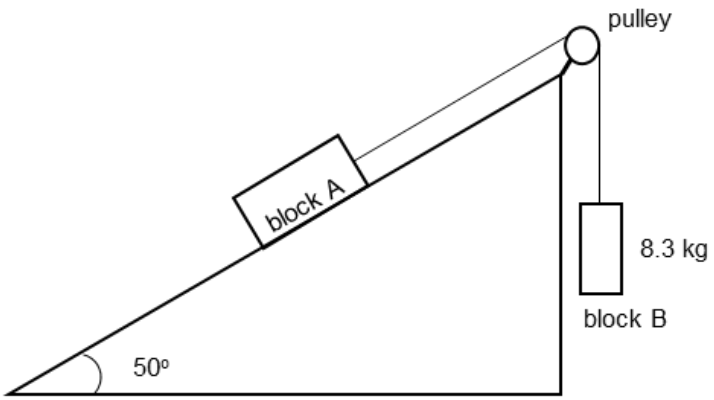

Fig. 1.1

(i) On Fig. 1.2, label the forces acting on block A.

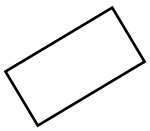

Fig. 1.2

[1]

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(ii) The tension of the string is 54 N.

Show that the mass of block A is 5.0 kg.

[3]

(b) Fig. 1.3 shows another experiment with block A from **(a).** Block A moves along a frictionless horizontal plane towards a stationary block C of mass 10 kg at a constant speed. Block A collides with block C at t = 0 s.

Fig. 1.3

The variation with time t of the momentum p of block A is shown in Fig. 1.4.

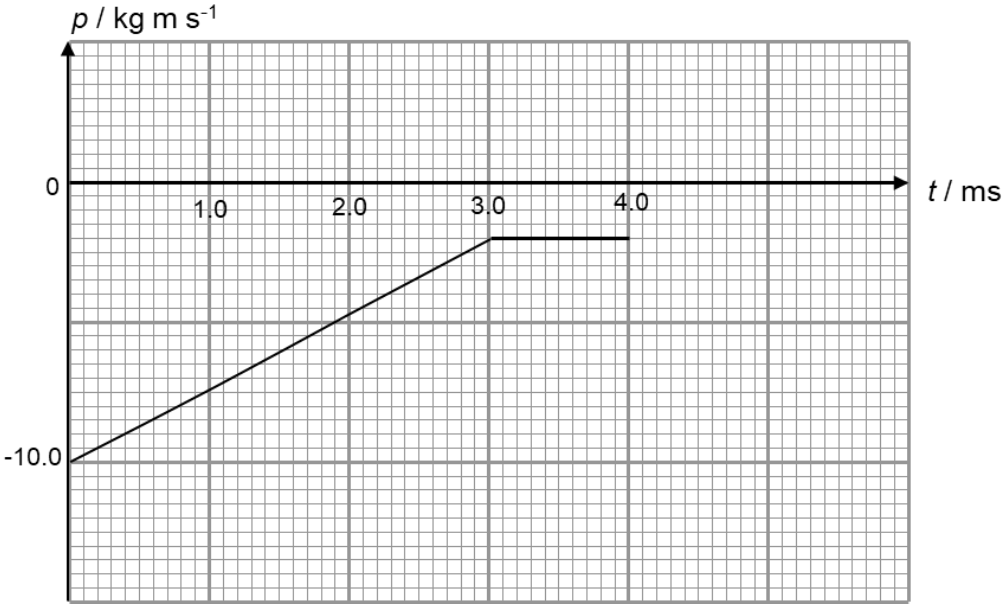

Fig. 1.4

[Turn over

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(i) Determine the force acting on block C during the collision.

force = …… N [2]

(ii) Calculate the velocity of block A after the collision.

velocity = …… m s^{-1} [2]

(iii) Deduce whether the collision between the two blocks is elastic or inelastic.

Show your working.

……

……..… [4]

[Total: 12]