2 Two spheres A and B approach each other as illustrated in Fig. 2.1.

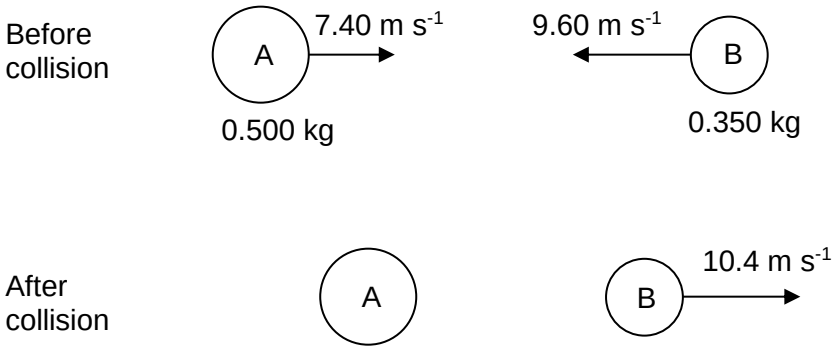

Fig. 2.1

Sphere A has a mass of 0.500 kg and moves to the right with a speed of 7.40 m s^{-1}.
Sphere B has a mass of 0.350 kg and moves to the left with a speed of 9.60 m s^{-1}.

The spheres collide and are in contact for a time of 0.400 s.

Sphere B reverses its direction of motion and moves off with a speed of 10.4 m s^{-1}.

(a) Using momentum consideration, explain quantitatively why spheres A and B cannot be at rest at the same instant.

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…….. [2]

(b) For the time during the collision, calculate the average force between the spheres.

average force = …… N [2]

(c) Use your answer in **(b)** to determine the magnitude of the velocity of sphere A after the collision. Explain your working.

magnitude of velocity = …… $m\ s^{-1}$ [3]

(d) By considering quantitatively the relative speeds of approach and of separation of the two spheres, deduce whether the collision is elastic or inelastic.

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…… [2]

[Total: 9]