2 Two blocks travel directly towards each other along a horizontal, frictionless surface, as illustrated in Fig. 2.1.

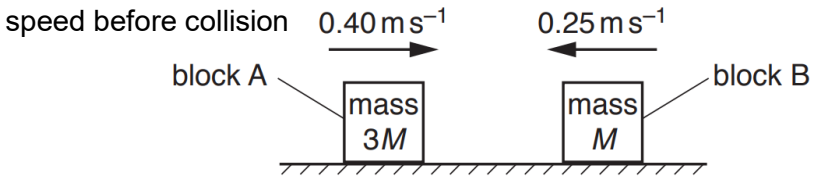

Fig. 2.1

Block A has a mass $3M$ and is moving towards block B with a speed of 0.40 m s^{-1}. Block B has a mass M and is moving towards block A with a speed of 0.25 m s^{-1}.

(a) Explain whether, during the collision, it is possible for both blocks to be at rest simultaneously.

……

……

……[2]

(b) **(i)** After the blocks collide, block A continues its direction of motion and moves off with a speed of 0.20 m s^{-1}.

Calculate the speed of block B after the collision.

speed = …….m s^{-1} [1]

(ii) Use your answer in **(b)(i)**, state and explain the direction of motion of block B.

…….....

…….…….... [1]

(c) A light plasticine is placed on block A so that the two blocks stick together after collision.

State and explain whether the collision is elastic or inelastic.

…….……..

…….……..

…….....[2]

[Total: 6]

Question 3 starts on the next page.