

4 (a) State the principle of conservation of momentum.

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.....
..... [2]

(b) An object A of mass 4.0 kg travels at a velocity of 6.0 ms^{-1} to the right on a horizontal frictionless surface. It moves towards a second object B of mass 2.0 kg that is moving at a velocity of 3.0 ms^{-1} in the same direction as A, as shown in Fig. 4.1.

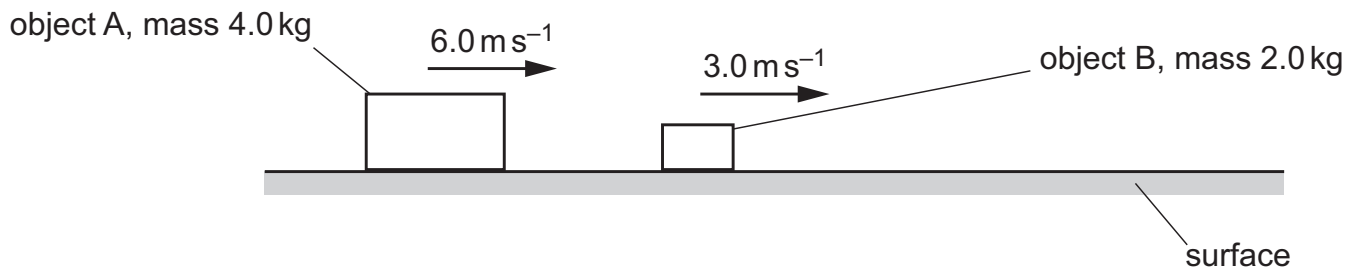


Fig. 4.1

Object A collides with object B. The two objects join and move off together with velocity v .

Calculate:

(i) velocity v

$v = \dots\dots\dots \text{ ms}^{-1}$ [2]

(ii) the percentage of the total initial kinetic energy of the two objects that is transferred to other forms of energy during the collision.

percentage = $\dots\dots\dots$ % [2]

[Total: 6]