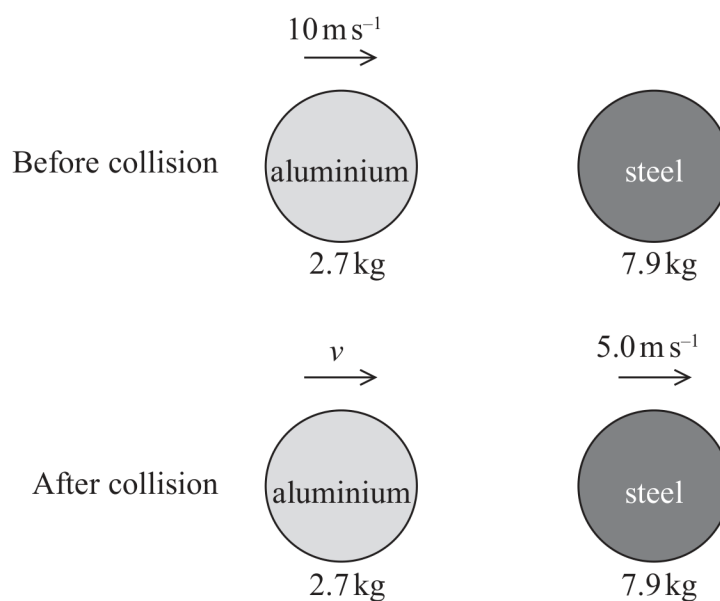**12** An aluminium sphere collides head-on with a stationary steel sphere. The two spheres move off separately after the collision.

(a) State the principle of conservation of momentum.

(2)

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(b) The aluminium sphere has an initial velocity of $10.0\,\mathrm{m\,s^{-1}}$. Immediately after the collision the velocity of the steel sphere is $5.0\,\mathrm{m\,s^{-1}}$.

Calculate the velocity v of the aluminium sphere immediately after the collision.

mass of aluminium sphere = $2.7\,\mathrm{kg}$
mass of steel sphere = $7.9\,\mathrm{kg}$

(3)

....

....

....

....

$v = $ ....

(Total for Question 12 = 5 marks)