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AS Level Physics A

H156/01 Breadth in Physics

Question Set 6

1. (a) A massive ball is released from rest above the ground.
According to a student, the principle of conservation of momentum is violated because the ball gains momentum as it falls.
Explain why the student's observation is incomplete and discuss how momentum is conserved in this situation.

[2]

(b) (i) Two balls **X** and **Y** are travelling in the same direction along a horizontal track.
Ball **X** makes a head-on collision with ball **Y**.
Fig. 23 shows the momentum against time *t* graph for ball **X** before, during and after the collision.

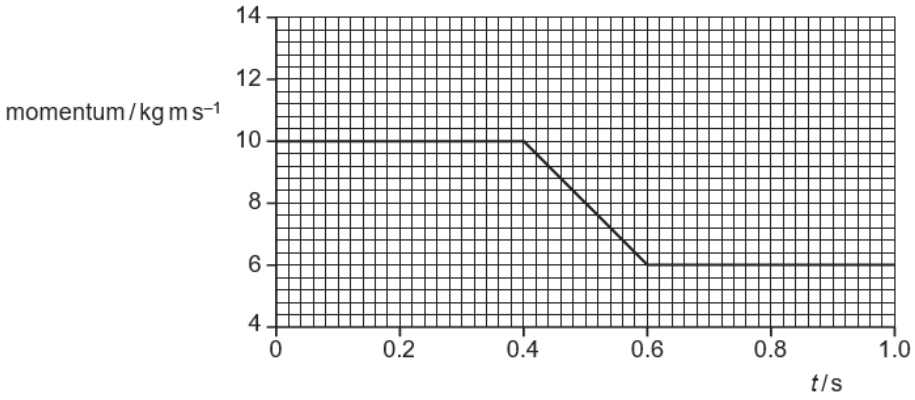

Fig. 23

Use Fig. 23 to calculate the force *F* acting on ball **X** during the collision.

F = N

[2]

(ii) The momentum of ball **Y** before the collision is 8.0 kg m s^{-1}.
On Fig. 23 sketch a graph to show the variation of the momentum of **Y** with time *t*.
Label this graph **Y**.

[3]

Total Marks for Question Set 6: 7

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