

4.2 Linear Momentum & Conservation

Question Paper

Course	CIE A Level Physics (9702) 2019-2021
Section	4. Dynamics
Topic	4.2 Linear Momentum & Conservation
Difficulty	Easy

Time allowed: 10

Score: /10

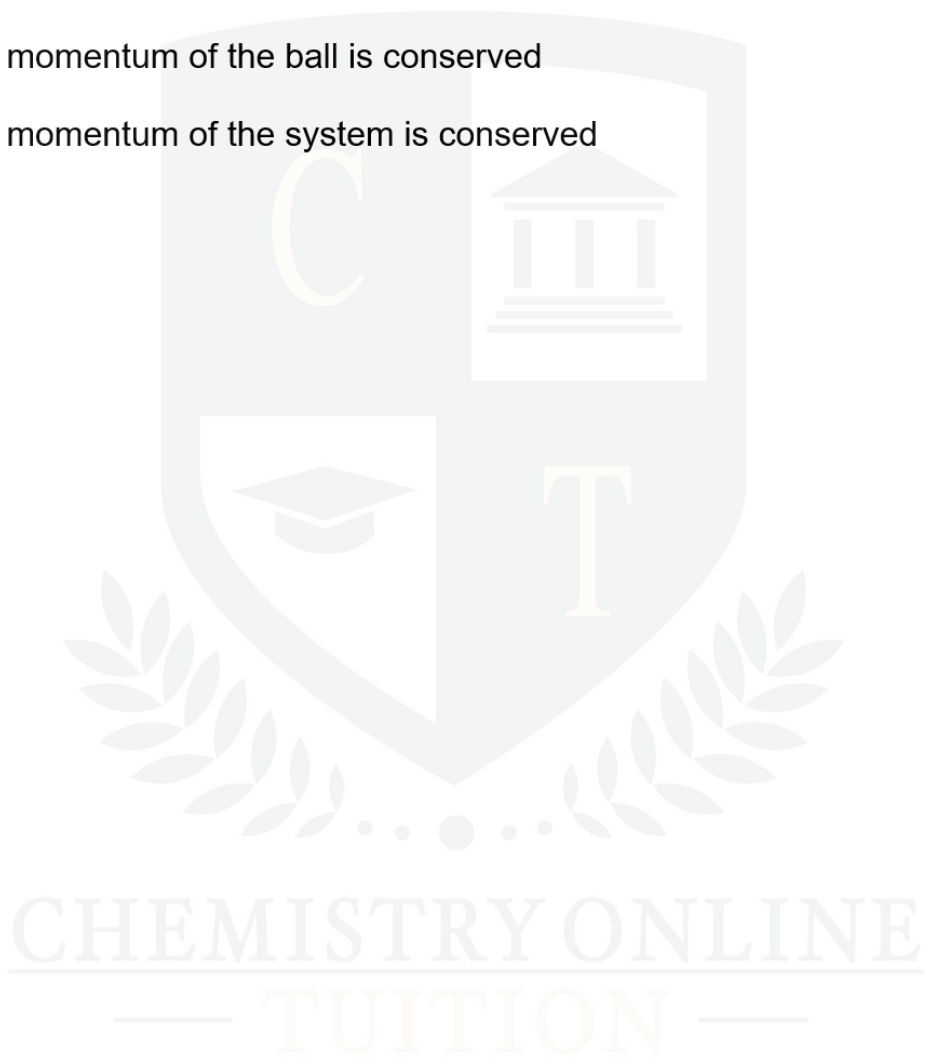
Percentage: /100

Question 1

Which statement about a ball that strikes a tennis racket and rebounds is **always** correct?

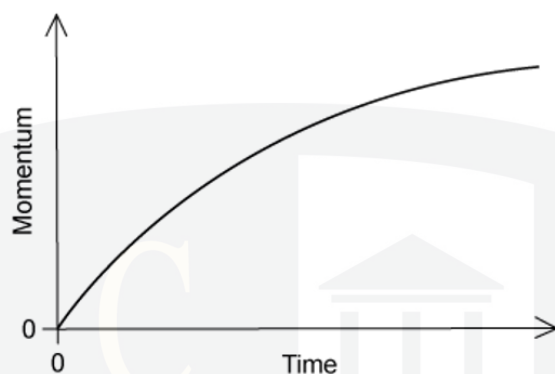
- A total kinetic energy of the ball is conserved
- B total kinetic energy of the system is conserved
- C total momentum of the ball is conserved
- D total momentum of the system is conserved

[1 mark]



Question 2

A car accelerates from rest. The graph shows the momentum of the car plotted against time.



What is the meaning of the gradient of the graph at a particular time?

- A** the velocity of the car
- B** the resultant force on the car
- C** the kinetic energy of the car
- D** the rate of change of kinetic energy of the car

[1 mark]

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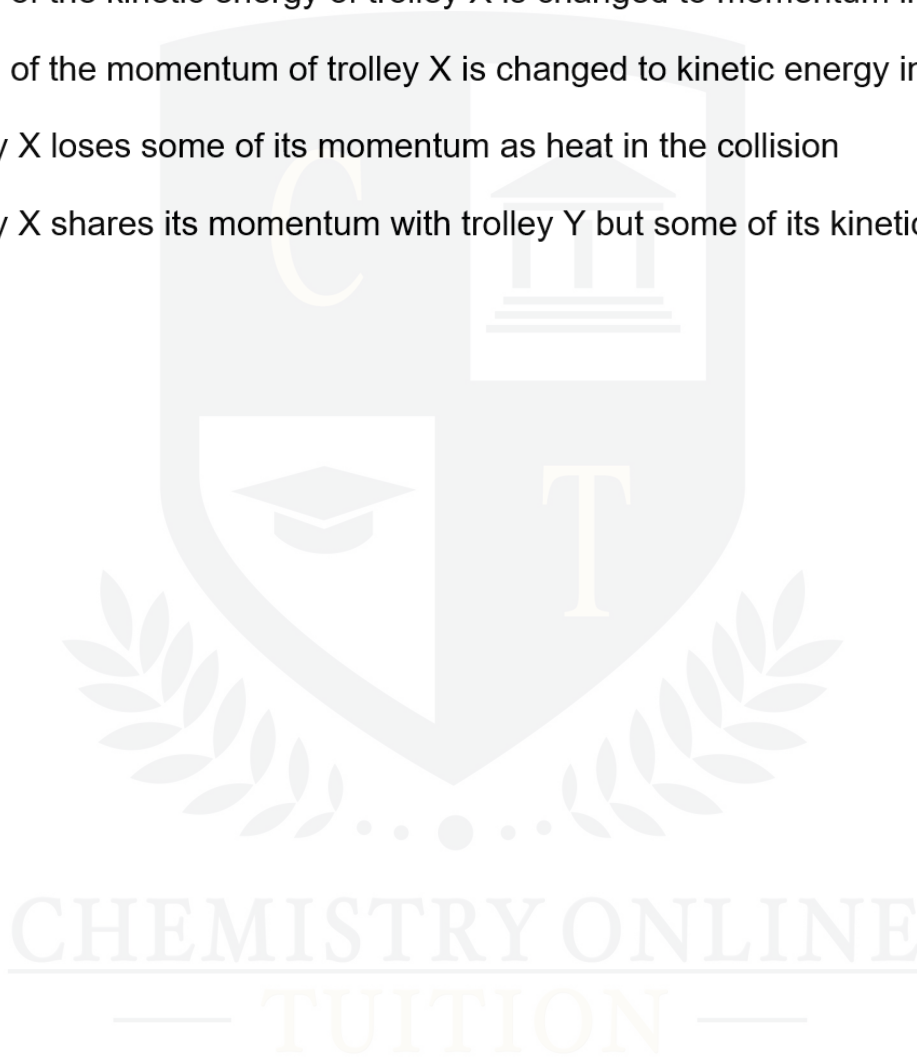
Question 3

Trolley X, moving along a horizontal frictionless track, collides with a stationary trolley Y. The two trolleys become attached and move off together.

Which statement about this interaction is correct?

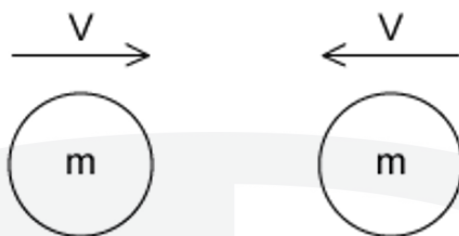
- A** some of the kinetic energy of trolley X is changed to momentum in the collision
- B** some of the momentum of trolley X is changed to kinetic energy in the collision
- C** trolley X loses some of its momentum as heat in the collision
- D** trolley X shares its momentum with trolley Y but some of its kinetic energy is lost

[1 mark]



Question 4

Two similar spheres, each of mass m and travelling with speed v , are moving towards each other



The spheres have a head-on elastic collision

Which statement is correct?

- A the spheres stick together on impact
- B the total kinetic energy after impact is mv^2
- C the total kinetic energy before impact is zero
- D the total momentum before impact is $2mv$

[1 mark]

Question 5

Which of the following is a statement of the principle of conservation of momentum?

- A in an elastic collision momentum is constant
- B momentum is the product of mass and velocity
- C the force acting on a body is proportional to its rate of change of momentum
- D the momentum of an isolated system is constant

[1 mark]

Question 6

Which quantity has the same base units as momentum?

- A density \times volume \times velocity
- B density \times energy
- C pressure \times area
- D weight \div area

[1 mark]

Question 7

Which row correctly states whether momentum and kinetic energy are conserved in an inelastic collision in which there are no external forces?

	momentum	kinetic energy
A	conserved	conserved
B	not conserved	conserved
C	conserved	not conserved
D	not conserved	not conserved

[1 mark]

Question 8

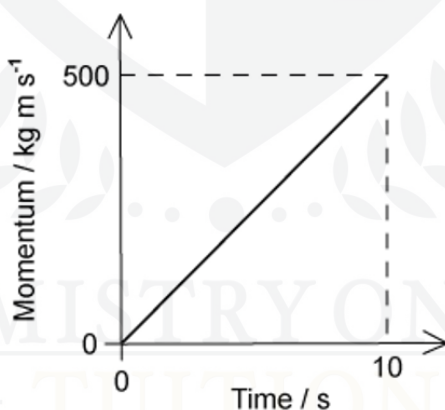
Two bodies travelling in a straight line collide in a perfectly elastic collision. Which of the following statements must be correct?

- A** the initial speed of one body will be the same as the final speed of the other body
- B** the relative speed of approach between the two bodies equals their relative speed of separation
- C** the total momentum is conserved but the total kinetic energy will be reduced
- D** one of the bodies will be stationary at one instant

[1 mark]

Question 9

The graph shows how the momentum of a motorcycle changes with time.



What is the resultant force on the motorcycle?

- A** 50 N
- B** 500 N
- C** 2500 N
- D** 5000 N

[1 mark]

Question 10

What is the principle of conservation of momentum?

- A** force is equal to the rate of change of momentum
- B** momentum is the product of mass and velocity
- C** the total momentum of two bodies after collision is equal to their total momentum before collision
- D** the total momentum of a system remains constant provided no external force acts on it

[1 mark]

