Momentum Questions for GCSE Physics

1. Calculate the momentum of a car with a mass of 1,000 kg, moving at 20 m/s.

2. A tennis ball of mass 0.2 kg is moving at 10 m/s. What is its momentum?

3. Rearrange the formula p=mv to calculate velocity when momentum and mass are given?

4. A cyclist and their bicycle have a total mass of 80kg. If their momentum is 320 kgm/s, what is their velocity.

5. What is the mass of an object with momentum 500 kgm/s moving at 25 m/s?

6. State the law of conservation of momentum.

7. Two objects collide. Object A has a mass of 2 kg and a velocity of 4 m/s, and object B has a mass of 3 kg and a velocity of −2 m/s. What is the total momentum before the collision?

8. A 1,500 kg car moving at 10 m/s collides with a stationary 2,000 kg truck. If they stick together after the collision, calculate their combined velocity?

9. A 5 kg ball moving at 8 m/s hits a stationary ball of mass 2 kg. After the collision, the first ball moves at 2 m/s. What is the velocity of the second ball?

10. Two ice skaters, one weighing 60 kg and the other 50 kg, push off each other from a stationary position. If the 60 kg skater moves at 2 m/s, find the velocity of the 50 kg skater.

11. A bullet of mass 0.01 kg is fired at 400 m/s from a gun of mass 2 kg. What is the recoil velocity of the gun?

12. In an explosion, a 10 kg object splits into two pieces. One piece of mass 4 kg moves left at 6 m/s. Calculate the velocity of the second piece.?

13. A stationary rocket with a total mass of 1,000 kg ejects gas at 500 m/s. If 200 kg of gas is ejected, find the velocity of the rocket after ejection.

14. Two carts on a frictionless track collide elastically. Cart A has mass 3 kg and moves at 5 m/s. Cart B has mass 2 kg and is stationary. After the collision, Cart A moves at 2 m/s. Find the velocity of Cart B.

15. A 1,000 kg car traveling at 15 m/s collides head-on with a 1,200 kg car traveling at −10 m/s. If they stick together, calculate their final velocity.

16. A 1,200 kg car traveling at 25 m/s collides with a 9000 kg truck moving at 15 m/s in the same direction. After the collision, the two vehicles stick together. Calculate the final velocity of the combined system.

17. Two ice hockey players, one 75 kg moving at 4 m/s and the other 65 kg moving at −3 m/s, collide and hold onto each other. Determine their velocity after the collision.

18. A trolley of mass 8 kg moving at 6 m/s collides with a stationary trolley of mass 12 kg. After the collision, the 8 kg trolley moves at 2 m/s. Find the velocity of the 12 kg trolley.

19. Explain why momentum is conserved in a closed system but not in an open system.

20. A 5,000 kg spacecraft is stationary in space. To propel itself, it ejects 1,000 kg of fuel at 2,500 m/s relative to the spacecraft. Calculate the final velocity of the spacecraft after the fuel is ejected.