

Question 1:

[Maximum mark: 1]

1 According to Newton's Second Law, force is equal to:

- a) $\text{Mass} \times \text{Velocity}$
- b) $\text{Mass} \times \text{Acceleration}$
- c) $\text{Mass} \div \text{Acceleration}$
- d) $\text{Velocity} \times \text{Time}$

Question 2:

[Maximum mark: 1]

2 A force of 10 N moves an object 5 m in the direction of the force. How much work is done?

- a) 2 J
- b) 15J
- c) 50J
- d) 100J

Question 3:

[Maximum mark: 1]

3 Which factor does **not** affect the torque produced by a force?

- a) Magnitude of the force.
- b) Distance from the pivot.
- c) Angle at which the force is applied.
- d) Mass of the object.

Question 4:

[Maximum mark: 1]

4 In which material does conduction occur most effectively?

- a) Wood
- b) Metal
- c) Plastic
- d) Air

Question 5:

[Maximum mark: 1]

5 Which quantity must remain constant for Charles's Law to apply?

- a) Pressure
- b) Volume
- c) Density
- d) Temperature

Question 6:

[Maximum mark: 5]

6 A student is investigating a simple electrical circuit in the laboratory. The student needs to measure the electric current flowing through the circuit.

- a) Identify the instrument used to measure electric current. **(1 mark)**
- b) State **two correct ways** to use this instrument in an electrical circuit. **(2 marks)**
- c) Explain **why the instrument must be connected in series with the circuit component being measured.** **(2 marks)**

Question 7:

[Maximum mark: 6]

7 A student creates waves by moving one end of a rope up and down. The wave travels along the rope, but the rope itself does not move from one end to the other.

- a) State what a wave transfers. **(1 mark)**
- b) Describe **two characteristics** of wave motion. **(2 marks)**
- c) Explain **how a wave transfers energy without transferring matter.** **(3 marks)**

Question 8:

[Maximum mark: 6]

8 A spacecraft is travelling close to a planet. Even though there is no physical contact between the spacecraft and the planet, the spacecraft is pulled towards the planet.

- a) Identify the type of object that creates a gravitational field. **(1 mark)**
- b) Describe **two properties** of a gravitational field. **(2 marks)**
- c) Explain **how a gravitational field causes the spacecraft to move towards the planet.** **(3 marks)**

Question 9:

[Maximum mark: 6]

9 A student is studying the structure of atoms and is asked to identify the particles that determine an element's identity.

- a) State what the **atomic number** of an element represents. **(1 mark)**
- b) Describe **two ways** in which the atomic number is important in identifying an element. **(2 marks)**

c) Explain **why two atoms with different atomic numbers must be different elements.** (3 marks)

Question 10:

[Maximum mark: 6]

10 A scientist is investigating the three main types of radiation emitted by radioactive substances: alpha, beta, and gamma radiation.

a) Identify the type of radiation that consists of **helium nuclei.** (1 mark)

b) Describe **two properties** of this type of radiation. (2 marks)

c) Explain **why this type of radiation has a high ionising power but a low penetrating power.** (3 marks)