

Answer Key — VoidV1 Demo

Physics – Model Answer Key & Rubrics

Reference solutions and detailed marking scheme — step marks shown

Q1. What is the unit of force? Define it.

Model Answer: The SI unit of force is **Newton (N)**.

Steps: One Newton is defined as the force required to accelerate a mass of 1 kilogram by 1 metre per second squared (1 m/s^2). Therefore, $1 \text{ N} = 1 \text{ kg} \cdot \text{m/s}^2$.

Common student mistakes: Writing 'kg' as the unit of force or confusing it with mass; omitting the relation $1 \text{ N} = 1 \text{ kg} \cdot \text{m/s}^2$.

Rubric:

- 1 mark for correctly stating the unit as 'Newton (N)'.
- 1 mark for giving the correct definition or formula: $1 \text{ N} = 1 \text{ kg} \cdot \text{m/s}^2$.

Total: 2 marks

Q2. State Newton's third law of motion.

Model Answer: For every action, there is an equal and opposite reaction. When one body exerts a force on a second body, the second body exerts an equal force in the opposite direction on the first body.

Steps: Short statement suffices; illustrate if needed: If body A exerts force F on body B, then B exerts force $-F$ on A.

Common student mistakes: Confusing action-reaction with cause-effect (i.e., thinking one causes the other) or stating unequal magnitudes.

Rubric:

- 2 marks for correctly stating the law clearly and unambiguously.

Total: 2 marks

Q3. What is the difference between speed and velocity?

Model Answer: **Speed** is a scalar quantity representing how fast an object moves (magnitude only). **Velocity** is a vector quantity representing rate of change of displacement, i.e., it has both magnitude and direction.

Steps: Explain that speed = distance/time, velocity = displacement/time; give a brief example if needed (e.g., 10 km/h east).

Common student mistakes: Using 'distance' instead of 'displacement' for velocity or failing to mention direction for velocity.

Rubric:

- 1 mark for correct statement about speed being scalar (magnitude only).
- 1 mark for correct statement about velocity being vector (magnitude and direction) and/or giving the correct formula relation.

Total: 2 marks

Total Marks for Paper: 6

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