

CHAPTER-8 | Force and Laws of Motion

QUIZ-01

1. What is the SI unit of force?

- A. $\text{kg m}^2 \text{s}^{-2}$ B. kg m s^{-1}
C. kg m s^{-2} D. N s (C)

Explanation: The SI unit of force is newton (N), and
 $1 \text{ N} = 1 \text{ kg m s}^{-2}$.

2. Which of the following situations illustrates Newton's First Law of Motion?

- A. A ball accelerating down a slope
B. A coin falling straight when a card is flicked
C. A balloon flying when air escapes
D. A cricket ball being caught (B)

Explanation: The coin remains at rest due to inertia when the card is flicked, showing Newton's First Law.

3. The tendency of a body to oppose a change in its state of motion is called:

- A. Acceleration B. Momentum
C. Inertia D. Force (C)

Explanation: Inertia is the natural tendency of objects to resist a change in motion or rest.

4. Which factor determines the inertia of a body?

- A. Volume B. Weight
C. Density D. Mass (D)

Explanation: Greater the mass, greater the inertia of the object.

5. What is the momentum of a 3 kg object moving at 4 m/s?

- A. 12 N B. 7 m/s
C. 12 kg m/s D. 1.5 N (C)

Explanation: Momentum (p) = mass $\times$ velocity = 3×4
= 12 kg m/s.

6. Newton's Second Law is mathematically expressed as:

- A. $F = mv$ B. $F = ma$
C. $F = v/u$ D. $F = m/a$ (B)

Explanation: The second law relates force to mass and acceleration as $F = ma$.

7. A bullet exerts a backward force on the gun. This is an example of:

- A. First law B. Second law
C. Third law D. Law of inertia (C)

Explanation: Newton's Third Law states: For every action, there is an equal and opposite reaction.

8. What is the acceleration of a 4 kg mass if a force of 12 N is applied?

- A. 48 m/s^2 B. 3 m/s^2
C. 16 m/s^2 D. 2 m/s^2 (B)

Explanation: $a = F/m = 12/4 = 3$ $a = F/m = 12/4 = 3 \text{ m/s}^2$.

9. If the net external force on an object is zero, it will:

- A. Stay at rest only
B. Move with zero acceleration
C. Stop moving D. Accelerate (B)

Explanation: When net force is zero, object either stays at rest or moves with uniform velocity.

10. Which physical quantity is conserved in the absence of external force?

- A. Force B. Acceleration
C. Momentum D. Mass (C)

Explanation: In the absence of external force, momentum remains conserved.