CHAPTER-8 | Force and Laws of Motion

QUIZ-01

1. What is the SI unit of force?

   A. kg m^2 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 N = 1 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 × velocity = 3 × 4 = 12 kg m/s.

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

   A. F = mvF = mv B. F = maF = ma

   C. F = v/uF = v/u D. F = m/aF = m/a (B)

Explanation : The second law relates force to mass and acceleration as F = maF = 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 = 3a = F/m = 12/4 = 3 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.