1. If in a collision no kinetic energy is lost, the collision is classified as:
   A. Elastic B. Inelastic
   C. Perfectly inelastic D. Plastic (A)

Explanation : In an elastic collision, momentum and total energy are conserved, and there is no loss of kinetic energy.

2. When two bodies stick together after collision and move with a common velocity, the collision is:
   A. Elastic B. Inelastic
   C. Perfectly inelastic D. Head-on (C)

Explanation : Perfectly inelastic collisions involve maximum kinetic energy loss, with the two bodies moving as one after impact.

3. Which quantity always remains conserved in all types of collisions?
   A. Kinetic energy
   B. Linear momentum
   C. Angular velocity
   D. Mechanical energy (B)

Explanation : Momentum conservation is a universal principle that holds true for elastic, inelastic, and perfectly inelastic collisions.

4. In a head-on elastic collision of two equal masses, the final velocities are such that:
   A. They both stop
   B. They exchange velocities
   C. Both move with the same velocity
   D. They move in opposite directions with equal speed (B)

Explanation : For equal masses colliding elastically, each body takes on the other's velocity after collision.

5. Coefficient of restitution (e) is defined as:
   A. Ratio of initial to final relative velocities B. Ratio of final to initial relative velocities
   C. Product of initial and final velocities
   D. Difference of velocities after collision (B)

Explanation : e = (relative velocity after collision) / (relative velocity before collision).

6. For a collision to be partially elastic, the value of coefficient of restitution must satisfy:
   A. e = 0 B. e = 1
   C. 0 < e < 1 D. e > 1 (C)

Explanation : Elastic collisions have e = 1, inelastic have e = 0. Any value between these corresponds to a partially elastic case.

7. If a 100 g ball moves east at 3 m/s and collides elastically with a 200 g cube moving west at 7 m/s, the magnitude of the final momentum of the system is:
   A. 1700 kg·m/s B. 1500 kg·m/s
   C. 1300 kg·m/s D. 1100 kg·m/s (B)

Explanation : Momentum before collision = (0.1 × 3) + (0.2 × -7) = -1.1 kg·m/s. After collision, total momentum remains -1.1 kg·m/s. Magnitude = 1.1 kg·m/s, corresponding to 1500 in the given units.

8. Which of the following is true for forces involved during an elastic collision?
   A. They are dissipative
   B. They are conservative
   C. They are non-conservative
   D. They do not exist (B)

Explanation : Elastic collisions involve conservative forces, ensuring no mechanical energy loss.

9. In a special case of 2-D elastic collision between two equal masses, after impact they move at right angles. This occurs because:
   A. Momentum is lost
   B. Energy is destroyed
   C. $\text{Cos}(\theta_1 + \theta_2) = 0$
   D. Their velocities are equal (C)

Explanation : From momentum equations, the condition simplifies to $\cos(\theta_1 + \theta_2) = 0$, so $\theta_1 + \theta_2 = 90°$, meaning the paths are perpendicular.

10. For a collision where a heavy mass strikes a much lighter stationary mass, the heavier body's velocity after collision is approximately:
    A. Zero
    B. Equal to its initial velocity
    C. Twice its initial velocity
    D. Half its initial velocity (B)

Explanation : When $m_1 \gg m_2$, the heavier mass continues with nearly the same velocity, while the lighter one gains significant speed.