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QUESTION PAPER

School: delhi public school

Teacher: atul singh

Grade: Grade 11

Subject: Physics

Chapter: Motion

Topic: Laws of motion

Subtopic: third law of motion

Q1: A 5 kg bowling ball and a 0.5 kg tennis ball are dropped simultaneously from the same height. Ignoring air resistance, which statement best describes the forces involved according to Newton's Third Law, and how do these forces relate to the acceleration of each ball? Explain your answer, including a discussion of action-reaction pairs and their effects on the two balls.

Difficulty: MEDIUM

Type: LONG

Subjective Type (No Options)

Q2: A rocket launches vertically upwards. Describe the action and reaction forces involved in the rocket's motion, specifically detailing what each force acts upon. Explain how these forces enable the rocket to accelerate upwards, even though the forces are equal and opposite.

Difficulty: MEDIUM

Type: LONG

Subjective Type (No Options)

Q3: Two ice skaters, one with a mass of 60 kg and the other with a mass of 80 kg, are standing at rest in the center of an ice rink. They push off of each other. If the 60 kg skater moves to the left with a velocity of 2 m/s, what is the velocity (magnitude and direction) of the 80 kg skater? Explain your reasoning using Newton's Third Law and the principle of conservation of momentum.

Difficulty: MEDIUM

Type: LONG

Subjective Type (No Options)

Q4: A person attempts to pull a heavy box across a rough floor. They apply a force of 100 N, but the box does not move. Identify the action-reaction pairs involved in this scenario, considering both the person-box interaction and the box-floor interaction. Explain why, even though the person is applying a force, the box remains stationary.

Difficulty: MEDIUM

Type: LONG

Subjective Type (No Options)

Q5: Explain how Newton's Third Law applies to the act of walking. Specifically, describe the action force and the reaction force involved when a person takes a step forward. How does the friction between the person's shoe and the ground contribute to the person's forward motion? Relate your explanation to the concept of momentum transfer.

Difficulty: MEDIUM

Type: LONG

Subjective Type (No Options)