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SUBJECT:- PHYSICS

CLASS:- IXTH

DATE:16/09/XX

SUBJECT TEACHER:- MR. NEEL NIRANJAN

CHAPTER 2. (FORCE & LAWS OF MOTION)(BASED ON NCERT PATTERN)

**Question 1.** From a rifle of mass 4 kg, a bullet of mass 50 g is fired with an initial velocity of 35 m/s. Calculate the initial recoil velocity of the rifle.

**Answer:**

**( $m_1$ ) Mass of rifle = 4 kg**

**( $m_2$ ) Mass of bullet = 50 g = 0.05 kg**

**( $v_2$ ) Velocity of bullet = 35 m/s**

**( $v_1$ ) Recoil velocity of rifle = ?**

**According to the law of conservation of momentum**

**Momentum of rifle = momentum of bullet**

$$m_1 v_1 = m_2 v_2$$

$$4 \text{ kg} \times v_1 = 0.05 \times 35 \text{ m/s}$$

$$\therefore v_1 = \frac{0.05 \times 35}{4} = \frac{1.75}{4}$$

$$v_1 = 0.4375 \text{ m/s}$$

$$\therefore \text{Recoil velocity of rifle} = 0.4375 \text{ m/s}$$

**Question 2.** Explain, why is it difficult for a fireman to hold a hose, which ejects a large amount of water at a high velocity.

**Answer:** The water that is ejected out from the hose in the forward direction comes out with a large momentum and equal amount of momentum is developed in the hose in the opposite direction and hence the hose is pushed backward. It becomes difficult for a fireman to hold a hose which experiences this large momentum.

**Question 3:**

A girl of mass 40 kg jumps with a horizontal velocity of 5 m/s onto a stationary cart with friction-less wheels. The mass of the cart is 3 kg. What is her velocity as the cart starts moving? Assume that there is no external unbalanced force working in the horizontal direction.

**Answer:**

4.65 m/s