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Science Test

Force and Law of motion

Ans 1. Galileo observe that the ball reached the same height when travelling from one inclined plane to other the height is same to height.

Ans 2. velocity of bullet = 0.1 m/s

$$\text{Mass} = 25 \text{g}$$

$$p = \text{Mass} \times \text{velocity}$$

$$p = 25 \times 0.1 \text{ m/s}$$

$$\text{Momentum of the bullet} = 2.5 \text{ kg m/s}$$

Ans 3. kg m/s

Ans 4. when it is an unbalanced force.

Ans 5. The force exerted by bat changes the direction of moving cricket ball.

Ans 8. Momentum, product of the mass of a particle and its velocity. Momentum is a vector quantity.

$$\text{Momentum (P)} = 5000 \text{ kg m/s}.$$

$$\text{Velocity} = 5 \text{ m/s}$$

~~mass =~~

$$P = \text{Mass} \times \text{velocity}.$$

$$\text{Therefore, } 5000 \text{ kg m/s} = m \times 5 \text{ m/s}.$$

$$\text{Mass} = 1000 \text{ kg}$$

Ans 9. Mass = 1000 kg

$$\text{Velocity} = 20 \text{ m/s}.$$

$$\text{final velocity} = 0$$

$$\text{Distance} = 50 \text{ m}$$

$$v^2 = u^2 + 2as$$

$$0 - u^2 = 2as$$

$$-20^2 = 2a \cdot 50$$

$$a = \frac{-400}{100}$$

$$a = -4 \text{ m/s}^2 \text{ (retardation)}$$

$$\text{Regarding force} = ma$$

$$= 1000 \times -4$$

$$= 4000 \text{ N}$$

Ans 11. $m = 10000 \text{ kg}$ $u = 0 \text{ m/s}$

$v = 10 \text{ m/s}$ $t = 50 \text{ s}$

Using: $v = u + at$

$$\therefore 10 = 0 + a(50) \Rightarrow a = 0.2 \text{ m/s}^2$$

$$F = ma = 10000 \times 0.2 = 2000 \text{ N}$$

force required = 2000 N.