

**SAINIK SCHOOL GOPALGANJ**  
**CLASS – XI**  
**ASSIGNMENT ON WORK , ENERGY AND POWER**

**SECTION A : MULTIPLE CHOICE QUESTION (TOTAL 05 QUESTIONS)**

1. A ball is travelling with uniform translatory motion. This means that
  - (a) it is at rest.
  - (b) the path can be a straight line or circular and the ball travels with uniform
  - (c) all parts of the ball have the same velocity (magnitude and direction) and the velocity is constant.
  - (d) the centre of the ball moves with constant velocity and the ball spins about its centre uniformly.
  
2. A metre scale is moving with uniform velocity. This implies
  - (a) the force acting on the scale is zero, but a torque about the centre of mass can act on the scale.
  - (b) the force acting on the scale is zero and the torque acting about centre of mass of the scale is also zero.
  - (c) the total force acting on it need not be zero but the torque on it is zero.
  - (d) neither the force nor the torque need to be zero.
  
3. Conservation of momentum in a collision between particles can be understood from
  - (a) Conservation of energy
  - (b) Newton's first law only
  - (c) Newton's second law only
  - (d) Both Newton's second and third law
  
4. A hockey player is moving northward and suddenly turns westward with the same speed to avoid an opponent. The force that acts on the player is
  - (a) frictional force along westward
  - (b) muscle force along southward
  - (c) frictional force along south-west
  - (d) muscle force along south-west
  
5. Nuclear reactions are based on conversion of \_\_\_\_\_ into Energy

## **SECTION B : SHORT ANSWERS QUESTIONS (TOTAL 05 QUESTIONS)**

6. State the Law of Conservation of Energy.
7. Derive Work – Energy Theorem for a variable Force.
8. Can Mass be converted into Energy ? How ?
9. Write two examples of Zero Work done.
10. What is a Head On Collision ?

## **SECTION C : LONG ANSWER QUESTIONS (TOTAL 05 QUESTIONS)**

11. Prove the Law of Conservation of Energy.
12. Discuss the Elastic and Inelastic Collision with the help of Momentum and Energy Equations.
13. Two billiard balls A and B, each of mass 50 g and moving in opposite directions with speed of  $5 \text{ m s}^{-1}$  each, collide and rebound with the same speed. If the collision lasts for  $10^{-3} \text{ s}$ , which of the following statements are true?  
The impulse imparted to each ball is  $0.25 \text{ kg}\cdot\text{ms}^{-1}$  and the force on each ball is 250 N.  
(a) The impulse imparted to each ball is  $0.25 \text{ kg}\cdot\text{ms}^{-1}$  and the force exerted on each ball is  $25 \times 10^5$   
(b) The impulse imparted to each ball is 0.5 N-s.  
(c) The impulse and the force on each ball are equal in magnitude and opposite in directions.
14. A body of mass 10 kg is acted upon by two perpendicular forces, 6 N and 8 N. Find the resultant acceleration of the system.
15. Using the concept of Conservative Forces explain how the work done is independent of the path taken by Gravitational Force.