ATOMIC ENERGY CENTRAL SCHOOL,ANUPURAM

CH-6 Work Power and Energy(Handout 5/6)

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PGT PHYSICS,AECS ANUPURAM

• **Elastic Collision**

A collision between two particles or bodies is said to be elastic if both the linear momentum and the kinetic energy of the system remain conserved.
Example: Collisions between atomic particles, atoms, marble balls and billiard balls.

• **Inelastic Collision**

A collision is said to be inelastic if the linear momentum of the system remains conserved but its kinetic energy is not conserved.
Example: When we drop a ball of wet putty on to the floor then the collision between ball and floor is an inelastic collision.

• Collision is said to be one dimensional, if the colliding particles, move along the same straight line path both before as well as after the collision.

• In one dimensional elastic collision, the relative velocity of approach before collision is equal to. the relative velocity of separation after collision.

- If two particles of mass m_1 and m_2 moving with velocities $\vec{u}_1$ and $\vec{u}_2$ respectively collide head on such that $\vec{v}_1$ and $\vec{v}_2$ be their respective velocities after collision, then,

$$\vec{v}_1 = \frac{(m_1 - m_2)\vec{u}_1 + 2m_2\vec{u}_2}{(m_1 + m_2)} \text{ and } \vec{v}_2 = \frac{2m_1\vec{u}_1 + (m_2 - m_1)\vec{u}_2}{(m_1 + m_2)}$$

- **Coefficient of Restitution or Coefficient of Resilience**
  Coefficient of restitution is defined as the ratio of relative velocity of separation after collision to the relative velocity of approach before collision.

It is represented by 'e'.

$$e = \frac{v_2 - v_1}{u_1 - u_2}$$