**Introduction to Classical Mechanics**

1. **What is Classical Mechanics?  
   Classical mechanics is a branch of physics that deals with the motion of objects under the influence of forces. It is based on principles established by Isaac Newton and provides a framework to describe and predict the behavior of physical systems.**
2. **Scope of Classical Mechanics**
   * **Motion of objects in everyday life (e.g., cars, planets, projectiles).**
   * **Analysis of forces and their effects on motion.**
   * **Applications in engineering and technology.**
3. **Key Concepts in Classical Mechanics**
   * **Distance and Displacement: Measure of motion with and without direction.**
   * **Speed and Velocity: Rate of change of position.**
   * **Acceleration: Change in velocity over time.**

**Newton's Laws of Motion**

1. **First Law (Law of Inertia):  
   An object will remain at rest or in uniform motion unless acted upon by an external force.**
   * **Example: A book on a table stays at rest until pushed.**
2. **Second Law (Force and Acceleration):  
   Force equals mass times acceleration, F=maF = maF=ma.**
   * **Example: A heavier object requires more force to move.**
3. **Third Law (Action and Reaction):  
   For every action, there is an equal and opposite reaction.**
   * **Example: A rocket moves forward by pushing gases backward.**

**Work, Energy, and Power**

1. **Work:  
   Work is done when a force is applied, and the object moves in the direction of the force.**

**Work=Force×Displacement**

1. **Energy:  
   The capacity to do work, classified into potential and kinetic energy.**
   * **Potential Energy: Stored energy due to position.**
   * **Kinetic Energy: Energy due to motion.**
2. **Power:  
   The rate at which work is done or energy is transferred.**