Laws of Motion Topics

1. Introduction to Laws of Motion

- **1.1 Force and Interaction**
- **1.2 Newton's First Law of Motion**
  - Concept of Inertia
- **1.3 Newton's Second Law of Motion**
  - Relation between Force and Acceleration
  - Concept of Momentum
  - Application of the Second Law
- **1.4 Newton's Third Law of Motion**
  - Action-Reaction Pairs
- **1.5 Conservation of Momentum**
  - Principle of Conservation of Linear Momentum

2. Types of Forces

- **2.1 Contact Forces**
  - Friction
  - Tension in a String
- **2.2 Non-Contact Forces**
  - Gravitational Force
  - Electrostatic Force
  - Magnetic Force

3. Free Body Diagrams

- **3.1 Concept and Importance**
- **3.2 Drawing Free Body Diagrams**
  - Identifying Forces
  - Calculating Net Force

4. Friction

- **4.1 Introduction to Friction**
- **4.2 Types of Friction**
  - Static Friction
  - Kinetic Friction
  - Rolling Friction
- **4.3 Laws of Friction**
- **4.4 Applications and Effects of Friction**

5. Circular Motion

- **5.1 Introduction to Circular Motion**
- **5.2 Centripetal Force**
    - Calculation and Examples
- **5.3 Banking of Roads**

6. Problems and Applications

- **6.1 Numerical Problems on Newton's Laws**
- **6.2 Real-World Applications**
    - Examples in Daily Life
    - Engineering Applications

7. Conclusion and Summary

- **7.1 Summary of Key Concepts**
- **7.2 Important Formulas**
- **7.3 Tips for Solving Problems**