# UNIT 3 PHYSICS

## **MOTION & GRAVITATIONAL FIELDS**

#### **Facts about Scalars and Vectors**

Multiplication and Division of Vectors Addition and Subtraction of Vectors Components of Vectors

#### **Straight-Line Motion under Constant Acceleration**

A Graphical Approach to Motion

#### Newton's Laws of Motion

Newton's First Law Newton's Second Law Newton's Third Law

#### **Inclined Planes**

#### **Projectile Motion**

Air Resistance Additional Questions on Projectile Motion

#### **Centripetal (Circular) Motion**

Circular Motion at Constant Speed Weight and Weightlessness Banking Around Curves Leaning into Curves Additional Questions on Centripetal Motion

#### Momentum and Impulse

Conservation of Momentum Elastic and Inelastic Collisions Additional Impulse and Momentum Questions

#### **Elastic Potential Energy**

Hooke's Law Additional Potential Energy Questions

#### Gravitation

Newton's Law of Universal Gravitation Gravitational Field Strength Orbital Motion Gravitational Force – Distance and Field Distance Graphs Weightlessness in Orbit

#### Relativity

Galilean and Newtonian Relativity Einstein and Special Relativity

## **ELECTRIC AND MAGNETIC FIELDS**

Coulomb's Law Electric Field About a Charge Uniform Electric Fields Magnetic Fields Permanent Magnets Forces Experienced by Permanent Magnets Magnetic Field Lines Magnetic Fields Produced by Moving Charges Magnetic Fields Produced by a Current in a Coil Magnetic Forces on Moving Charges Magnetic Forces on Current Carrying Conductors DC Motors

### **GENERATION AND TRANSMISSION OF ELECTRICITY**

Conductors Pushed Through Magnetic Fields Magnetic Flux Electromagnetic Induction Induced EMF in a Straight Conductor Generators How Generators Differ from Motors Calculation of EMF Alternating Voltage and Current Transformers Power Transmission