PHYSICS

1) **PHYSICAL WORLD:**

What is physics? Scope and excitement of Physics, Physics, technology and society, Fundamental forces in nature, Gravitational Force, Electromagnetic Force, Strong Nuclear Force, Weak Nuclear Force, Towards Unification of Forces, Nature of physical laws.

2) **UNITS AND MEASUREMENTS:**

Introduction, The international system of units, Measurement of Length, Measurement of Large Distances, Estimation of Very Small Distances: Size of a Molecule, Range of Lengths, Measurement of Mass, Range of Masses, Measurement of time , Accuracy, precision of instruments and errors in measurement, Systematic errors, random errors, least count error, Absolute Error, Relative Error and Percentage Error, Combination of Errors, Significant figures, Rules for Arithmetic Operations with Significant Figures, Rounding off the Uncertain Digits, Rules for Determining the Uncertainty in the Results of Arithmetic Calculations, Dimensions of Physical Quantities, Dimensional Formulae and dimensional equations, Dimensional Analysis and its Applications, Checking the Dimensional Consistency of Equations, Deducing Relation among the Physical Quantities.

3) **MOTION IN A STRAIGHT LINE:**

Introduction, Position, path length and displacement, Average velocity and average speed, Instantaneous velocity and speed, Acceleration, Kinematic equations for uniformly accelerated motion, Relative velocity.

4) **MOTION IN A PLANE:**

Introduction, Scalars and vectors, Position and Displacement Vectors, Equality of Vectors, Multiplication of vectors by real numbers, Addition and subtraction of vectors - graphical method, Resolution of vectors, Vector addition - analytical method, Motion in a plane, Position Vector and Displacement, Velocity, Acceleration, Motion in a plane with constant acceleration, Relative velocity in two dimensions. Projectile motion, Equation of path of a projectile, Time of Maximum height, Maximum height of a projectile, Horizontal range of projectile, Uniform circular motion.

5) **LAWS OF MOTION:**

Introduction, Aristotle's fallacy, The law of inertia, Newton's first law of motion, Newton's second law of motion, Momentum Impulse Newton's third law of motion, Conservation of momentum, Equilibrium of a particle, Common forces in mechanics, friction, rolling friction, Circular motion, Motion of a car on a level road, Motion of a car on a Banked road, Solving problems in mechanics.

6) **WORK, ENERGY AND POWER:**

Introduction, The Scalar Product, Notions of work and kinetic energy : The work-energy theorem, Work, Kinetic energy, Work done by a variable force, The work-