Board of Secondary Education, Rajasthan, Ajmer

Revised Syllabus for Examination 2021

Subject : **Physics**
Subject Code : **040**
Class : **XI**

Examination	Time (Hours)	Marks	Total Marks
Theory	3:15	70	100
Practical	4:00	30	

Books - Physics (Part-I & Part-II)

Unit No. and Title	Chapter No. and Title	Title and Subject Matter	Marks
I- Physical World and Measurement	1- Physical World	Fundamental forces of nature	04
	2-Units and Measurements	Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures. Dimensions of physical quantities, dimensional analysis and its applications.	
II-Kinematics	3-Motion in a Straight Line	Elementary concepts of differentiation and integration for describing motion, uniform and non- uniform motion, uniformly accelerated motion, Relations for uniformly accelerated motion (graphical treatment).	09
	4-Motion in a Plane	Scalar and vector quantities; position and displacement vectors, general vectors and their notations; equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors, relative velocity, Unit vector; resolution of a vector in a plane, rectangular components, Scalar and Vector product of vectors. Motion in a plane, cases of uniform velocity and uniform acceleration projectile motion,	

Unit No. and Title	Chapter No. and Title	Title and Subject Matter	Marks
III-Laws of Motion	5-Laws of Motion	Equilibrium of concurrent forces, Static and kinetic friction, laws of friction, rolling friction, lubrication. Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on a level circular road, vehicle on a banked road).	**05**
IV- Work, Energy and Power	6-Work, Energy and Power	potential energy of a spring, conservative forces, nonconservative forces: motion in a vertical circle; elastic and inelastic collisions in one and two dimensions.	**06**
V- Motion of System of Particles and Rigid Body	7-Systems of Particles and Rotational Motion	Centre of mass of a two-particle system, momentum conservation and centre of mass motion. Centre of mass of a rigid body; centre of mass of a uniform rod. Moment of a force, torque, angular momentum, law of conservation of angular momentum and its applications. Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions. Moment of inertia, radius of gyration, values of moments of inertia for simple geometrical objects (no derivation).	**09**
VI- Gravitation	8-Gravitation	Variation of Acceleration due to gravity with altitude and depth. Gravitational potential energy and gravitational potential, escape velocity, orbital velocity of a satellite, Geo-stationary satellites.	**05**
VII- Properties of Bulk Matter	9-Mechanical Properties of Solids	Stress-strain relationship, Hooke's law, Young's modulus,	**13**
	10-Mechanical Properties of Fluids	Pascal's law and its applications (hydraulic lift and hydraulic brakes), effect of gravity on fluid pressure. Viscosity, Stokes' law, terminal velocity, streamline and turbulent flow, critical velocity, Bernoulli's theorem and its applications. Surface energy and surface tension, angle of contact, excess of pressure across a curved surface, application of surface tension ideas to drops, bubbles and capillary rise.	
	11-Thermal Properties of Matter	thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; Cp, Cv - calorimetry; change of state - latent heat capacity. thermal conductivity, Wein's displacement Law, Stefan's law	
VIII- Thermodynamics	12-Thermodynamics	Thermal equilibrium and definition of temperature (zeroth law of thermodynamics),	**05**

Unit No. and Title	Chapter No. and Title	Title and Subject Matter	Marks
		heat, work and internal energy. First law of thermodynamics, isothermal and adiabatic processes. Second law of thermodynamics: reversible and irreversible processes	
IX- Behaviour of Perfect Gases and Kinetic Theory of Gases	13- Kinetic Theory	Equation of state of a perfect gas, work done in compressing a gas. Kinetic theory of gases - assumptions, concept of pressure. Kinetic interpretation of temperature; rms speed of gas molecules; degrees of freedom, law of equipartition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.	**05**
X- Oscillations and Waves	14- Oscillations	Periodic motion - time period, frequency, displacement as a function of time, periodic functions. Simple harmonic motion (S.H.M) and its equation; phase; oscillations of a loaded spring-restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum derivation of expression for its time period. Free, forced and damped oscillations (qualitative ideas only), resonance.	**09**
	15- Waves	Wave motion: Transverse and longitudinal waves, speed of travelling wave, displacement relation for a progressive wave, principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, Beats	
		Total	**70**