BAL BHARATI PUBLIC SCHOOL

COMMON ANNUAL EXAMINATION (2024-2025)

SYLLABUS

CLASS: XI SUBJECT: PHYSICS (THEORY)

TEXTBOOKS:

1. **NCERT PHYSICS PART-1**
2. **NCERT PHYSICS PART-2**

S.NO.	UNIT/CHAPTER /TOPIC	SUBTOPICS	WEIGHTAGE
1	**Unit–I**	**Physical World and Measurement** **Chapter–2: Units and Measurements** Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Significant figures. Dimensions of physical quantities, dimensional analysis and its applications.	23
2	Unit II	**Kinematics** **Chapter–3: Motion in a Straight Line** Frame of reference, Motion in a straight line, Elementary concepts of differentiation and integration for describing motion, uniform and non- uniform motion, and instantaneous velocity, uniformly accelerated motion, velocity - time and position-time graphs. Relations for uniformly accelerated motion (graphical treatment). **Chapter–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 areal number; addition and subtraction of vectors, Unit vector; resolution of avector in a plane, rectangular components, Scalar and Vector product of vectors. Motion in a plane, cases of uniform velocity and uniform acceleration- projectile motion, uniform circular motion.	

3	Unit-III	**Laws of Motion** **Chapter–5: Laws of Motion** Intuitive concept of force, Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion. Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces, Static and kinetic friction, laws of friction, rollingfriction, lubrication. Dynamics of uniform circular motion: Centripetal force, examples of circularmotion (vehicle on a level circular road, vehicle on a banked road).	
4	Unit - IV	**Work, Energy and Power** **Chapter–6: Work, Energy and Power** Work done by a constant force and a variable force; kinetic energy, work- energy theorem, power. Notion of potential energy, potential energy of a spring, conservative forces:non-conservative forces, motion in a vertical circle; elastic and inelastic collisions in one and two dimensions.	17
5	Unit - V	**Motion of System of Particles and Rigid Body** **Chapter–7: System 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 auniform rod. Moment of a force, torque, angular momentum, law of conservationof angular momentum and its applications. Equilibrium of rigid bodies, rigid body rotation and equations of rotationalmotion, comparison of linear and rotational motions. Moment of inertia, radius of gyration, values of moments of inertia for simplegeometrical objects (no derivation).	
6	Unit VI	**Gravitation** **Chapter–8: Gravitation** Kepler's laws of planetary motion, universal law of gravitation.Acceleration due to gravity and its variation with altitude and depth. Gravitational potential energy and gravitational potential, escape speed, orbital velocity of a satellite.	

7	Unit VII	**Properties of Bulk Matter** **Chapter–9: Mechanical Properties of Solids** Elasticity, Stress-strain relationship, Hooke's law, Young's modulus, bulkmodulus, shear modulus of rigidity (qualitative idea only), Poisson's ratio; elastic energy. **Chapter–10: Mechanical Properties of Fluids** Pressure due to a fluid column; Pascal's law and its applications (hydrauliclift and hydraulic brakes), effect of gravity on fluid pressure. Viscosity, Stokes' law, terminal velocity, streamline and turbulent flow, criticalvelocity, Bernoulli's theorem and its simple 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. **Chapter–11: Thermal Properties of Matter** Heat, temperature, 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. Heat transfer-conduction, convection and radiation, thermal conductivity, qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law .	20
8	Unit VIII	**Thermodynamics** **Chapter–12: Thermodynamics** Thermal equilibrium and definition of temperature, zeroth law of thermodynamics, heat, work and internal energy. First law of thermodynamics, Second law of thermodynamics: gaseous state of matter, change of condition. of gaseous state -isothermal, adiabatic, reversible, irreversible, and cyclic processes.	
9	Unit IX	**Behavior of Perfect Gases and Kinetic Theory of Gases** **Chapter–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 equi-partition of energy	

		(statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.	
10	Unit X	**Oscillations and Waves** **Chapter–14: Oscillations** Periodic motion - time period, frequency, displacement as a function of time,periodic functions and their applications. Simple harmonic motion (S.H.M) and its equations of motion; phase; oscillationsof a loaded spring- restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum derivation of expression for itstime period. Chapter–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, fundamental mode and harmonics, Beats.	10
			TOTAL MARKS= 70

Note: There is a discrepancy between the chapter numbering in the CBSE prescribed syllabus and the new edition of the NCERT book for the 2024-25 session. It is suggested that the subject teachers must adhere to the chapter names and corresponding weightages as mentioned in the CBSE syllabus of year 2024-25 also make students aware about this already existing discrepancy.

FOR CLASS 11:

THEORY (Subject Specific as per CBSE): 80 / 70 / 60 / 30 marks

INTERNAL ASSESSMENT (Subject Specific as per CBSE) (Practical/Project Work/Viva): 20 / 30 / 40 / 70 marks