

WBJEE 2027 Physics Syllabus — Chapter-Wise

Candidates can check the Physics chapter wise syllabus which they must have studied in class 10+2. If you have prepared well for these topics, it would not be difficult for you to crack the exam.

WBJEE 2026 Question Paper Pattern

All questions in WBJEE are **Multiple-Choice Questions (MCQs)** with four options. Each subject contains three categories of questions with different marking and negative-marking schemes.

Subject	Category 1	Category 2	Category 3	Total Questions	Total Marks
Mathematics	50	15	10	75	100
Physics	30	5	5	40	50
Chemistry	30	5	5	40	50

Category-wise Marking Scheme

Category	Marks per Question	Negative Marking
Category 1	1 mark	–¼ mark for an incorrect answer
Category 2	2 marks	–½ mark for an incorrect answer
Category 3	2 marks	No negative marking

Total: 155 questions carrying **200 marks**.

Exam Pattern of Physics

Particular	Details
Subject	Physics
Number of Questions	40
Total Marks	50

Difficulty Level	Moderate to Difficult
Major Topics	Mechanics, Thermodynamics, Electrostatics, Magnetic Effects of Current, Optics, Modern Physics, etc.
Question Focus	Numerical problems and conceptual understanding
Preparation Focus	Strong concepts, formula application, numerical practice and problem-solving speed

Chapter-wise Syllabus of Physics

No.	Chapter	Major Topics
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1	Physical World, Measurements, Units & Dimensions	Physical quantities, fundamental and derived units, dimensional analysis, measurement, accuracy and precision, errors, significant figures, rounding off, order of magnitude
2	Motion in One and Two Dimensions	Physical World, fundamental and derived units. Units & Dimensions of physical quantities, dimensional analysis & its applications. Need for measurement, units of measurement, accuracy and precision of measurements, error in measurement, rounding off and order of magnitude, significant figures and their application.

3	Motion in a Plane	Scalars and vectors, representation of vectors in 3D, dot and cross product and their application, resolution of vectors, rectangular and non-rectangular. Relative velocity, Motion in a plane, cases of uniform velocity and uniform acceleration, uniformly accelerated motion (using graphical and calculus methods), projectile motion and inclined plane.
4	Laws of Motion	Force and inertia, Newton's laws of motion, impulse and impulsive force, Conservation of linear momentum with applications, Concept of free body diagram and its application, Equilibrium of concurrent force, Static and Kinetic friction, laws of friction, ideas of coefficient of friction, rolling friction. Dynamics of uniform circular motion, centripetal and centrifugal forces and their applications, banking of roads,

5	Work, Power and Energy	Work, power, energy, work-energy theorem with constant and variable forces, work done by constant & variable forces, potential energy (PE) & kinetic energy (KE), conservation of mechanical energy, conservative and nonconservative forces, PE of a spring, motion in a vertical circle, elastic and inelastic collisions in one and two dimensions
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6	Motion of System of Particles and Rigid Body	Centre of mass of the two- particle system, motion of the connected system, torque, angular momentum, law of conservation of angular momentum and its INFORMATION BULLETIN-WBJEE-2026 WBJEEB 43 application, equilibrium of rigid bodies, concept of moments of inertia with idea of radius of gyration, moments of inertia of simple geometric bodies [without derivation], parallel and perpendicular axis theorem and their applications
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7	Gravitation	Universal law of gravitation, acceleration due to gravity (g), variation of g, Kepler's laws and applications, gravitational potential & PE, escape velocity, orbital velocity of satellites, time period of satellites, geostationary satellites.
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8	Bulk Properties of Matter	Elasticity, Hooke's law, Young's modulus, bulk modulus, idea of compressibility, shearing modulus, Poisson's ratio, elastic potential energy of stretched string and extended spring, Fluid pressure: Pressure due to a fluid column, buoyancy, Pascal's law, effect of gravity on fluid pressure. Surface tension: Surface energy, phenomena involving surface tension, excess pressure, application of surface tension for drops and bubbles, angle of contact, and capillary rise
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9	Viscosity	Coefficient of viscosity, streamline & turbulent motion, Reynolds' number, Stokes' law, terminal velocity, Bernoulli's theorem and its applications.
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10	Heat and Thermal Physics	Heat & temperature, thermal expansion of solids. Liquids & gases, ideal gas laws, isothermal & adiabatic processes; anomalous expansion of water & its effects, sp. heat capacity, Calorimetry: change of state, specific latent heat capacity. Heat transfer: conduction, convection and radiation, conduction of heat through slabs in series and parallel combination and the idea of equivalent thermal conductance. Black body radiation, Kirchhoff's law, thermal conductivity, Newton's law of cooling, Wien's displacement law, Stefan's law and Boltzmann's correction
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11	Thermodynamics	Thermal equilibrium (Zeroth law of thermodynamics), concept of heat, external work and internal energy. 1st law of thermodynamics, CP and CV determination and relation between them, isothermal & adiabatic processes and relation equations, P-V diagrams, calculation of external works. 2nd law of thermodynamics, reversible & irreversible processes, Carnot engine and its efficiency, efficiency of refrigerator (only qualitative idea)
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12	Kinetic Theory of Gases	Equation of state of a perfect gas, kinetic theory of gases, assumptions in Kinetic theory of gases, concept of INFORMATION BULLETIN-WBJEE-2026 WBJEEB 44 pressure. & temperature; rms speed of gas molecules; degrees of freedom, law of equipartition of energy (introductory ideas) & application to specific heats of gases; mean free path, Avogadro's number
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13	Oscillations and Waves	Periodic motion – time period, frequency, time displacement equation, Simple harmonic motion (S.H.M) & its equation; phase; SHM in different systems, restoring force & force constant, energy in S.H.M.-KE & PE, determination of time period of simple pendulum, loaded spring, liquid-filled U-tubes, floating body in liquid, vertical SHM. Free, forced & damped oscillations (introductory ideas), resonance wave motion, equation for progressive wave, longitudinal & transverse waves, sound waves. Newton's formula & Laplace's correction, factors affecting the velocity of sound in air, principles of superposition of waves, reflection of waves, standing waves in strings & organ pipes, fundamental mode, harmonics & overtones, beats, Doppler effect of sound.
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14	Electrostatics	Conservation of electric charges, Coulomb's law force between two-point charges, forces between multiple charges; superposition principle & continuous charge distribution. Electric field: electric field due to a point charge, electric field lines. Electric dipole, electric field due to a dipole (at a point on its axis, at a point on its perpendicular bisector, at any point), and torque on a dipole in a uniform electric field. Electric flux, statement of Gauss's theorem and its application to find the field due to an infinitely long straight wire, a uniformly charged infinite plane sheet, and a uniformly charged thin spherical shell (field inside and outside). Electric potential, potential difference, relation between electric field intensity and potential, electric potential: due to a point charge, a dipole and a system of point charges, equipotential surface and its properties, electrical potential - energy of a system of two-point charges and of an electric dipole in an electrostatic field. Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarization. Capacitors
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		and capacitance are a combination of capacitors in series and in parallel. Capacitance of parallel plate capacitors with or without a dielectric medium between the plates. Capacitances of solid and hollow spherical capacitors. Energy is stored in a capacitor. Examples of capacitors in our daily life (only qualitative ideas).
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15	Current Electricity	Electric current, the flow of electric charge in a metallic conductor. Drift velocity, mobility and their relation with electric current. Ohm's law, electrical resistance, resistivity and conductivity. V-I characteristics for ohmic resistance, temperature dependence of resistance. Series, parallel and mixed grouping of resistances. Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel and in mixed grouping. Parallel combination of two cells of unequal emfs, series combination of n cells of unequal emfs. Kirchhoff's law and simple applications. Wheatstone bridge principle, Meter Bridge principle (end error correction not required). Potentiometer: principle and its applications to measure the potential difference and for comparing emfs of two cells, and measurement of the internal resistance of a cell.
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16	Magnetic Effect of Current and Magnetism	Concept of magnetic field, Oersted's experiment, Biot - Savart law & its application to current carrying circular loop; Ampere's law & its applications to infinitely long straight wire, straight and toroidal solenoids; force on a moving charge in uniform magnetic & electric fields, cyclotron frequency; force on a current-carrying conductor in a uniform magnetic field, force between two parallel current-carrying conductors-- definition of ampere. Torque experienced by a current loop in a uniform magnetic field; moving coil galvanometer current sensitivity & conversion to ammeter & voltmeter, Inter-conversion of voltmeter & ammeter & change of their ranges. Current loop as a magnetic dipole & its magnetic dipole moment, magnetic dipole moment of a revolving electron, magnetic field intensity due to a magnetic dipole bar magnet along its axis & perpendicular to its axis, torque on a magnetic dipole (bar magnet) in a uniform magnetic field; magnet as an equivalent solenoid, magnetic field lines; Earth's magnetic field & its magnetic
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		elements. Magnetic properties of a material: magnetic permeability, magnetic susceptibility, intensity of magnetisation, magnetic retentivity and coercivity. Hysteresis: B – H loop and its significance (only qualitative idea). Para-, dia- & ferromagnetic substances, with examples. Electromagnets & the factors affecting their strengths, permanent magnets
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17	Electromagnetic Induction and Alternating Current	Electromagnetic induction, concept of magnetic flux. INFORMATION BULLETIN-WBJEE-2026 WBJEEB 46 Faraday's laws, induced emf and current, Lenz's law, and Eddy current. Concept of self and mutual inductance, self-inductance of a solenoid and mutual inductance of two coaxial solenoids (qualitative ideas). Alternating current, peak and RMS values of alternating current/voltage, reactance and impedance. Concept of phasor diagram: only resistive circuit, only inductive circuit, only capacitive circuit. LR circuit, CR circuit, and LCR series circuit, resonance LC oscillator (qualitative idea only). Power in an AC circuit, power factor in an AC circuit, wattless current. AC generator and transformer.
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18	Electromagnetic Waves	Basic idea of displacement current. Electromagnetic waves and their characteristics (qualitative ideas only). Transverse nature of electromagnetic waves, electromagnetic spectrum, applications of the waves from the different parts of the spectrum, Basic idea of displacement current.
19	Optics I – Ray Optics	Reflection of light, spherical mirrors, mirror formula. Refraction of light, total internal reflection & its applications, optical fibres, refraction at spherical surfaces, lenses, thin lens formula, lens maker's formula. Newton's relation: Displacement method to find the position of images (conjugate points), Magnification, power of a lens, A combination of thin lenses in contact, a combination of a lens & a mirror. Refraction and dispersion of light through a prism; optical instruments, image formation & accommodation, correction of eye defects (myopia, hypermetropia) using lenses, microscopes & astronomical telescopes (reflecting & refracting)

		& their magnifying powers
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20	Optics II – Wave Optics	Wave front and Huygens' principle, reflection and refraction of a plane wave at a plane surface using Huygens' principle. Interference: interference of monochromatic light by double slits – Young's experiment, conditions for sustained interference of light – coherent sources, conditions of maxima and minima in terms of path difference and phase difference, expression for the fringe width. Diffraction: Fraunhofer's diffraction due to a single slit, width of the central maximum Resolving power of microscope and astronomical telescope. Polarisation, plane polarised light. Brewster's law uses plane-polarised light and a polaroid. The scattering of the light- blue colour of the sky is an elementary example of the Raman effect. Particle nature of light & wave-particle dualism: Particle nature of light, Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation Matter waves; wave nature of particles, De Broglie relation and its simple applications
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21	Atomic Physics	Alpha-particle scattering experiment, Rutherford's nuclear atom model of atom; Bohr model of hydrogen atom, energy levels in a hydrogen atom, hydrogen spectrum, continuous & characteristic X-rays, Moseley's law
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22	Nuclear Physics	Composition & size of nucleus, atomic masses, isotopes, isobars; isotones, radioactivity - alpha, beta & gamma particles/ rays & their properties; radioactive decay law; mass-energy relation, mass defect; binding energy per nucleon & its variation with mass number; chain reaction, nuclear fission & fusion.
23	Solid State Electronics	Band theory of solids (qualitative ideas only), classification of conductors, insulators & semiconductors in terms of band theory; Intrinsic and extrinsic semiconductors, Band Diagram.

24	Semiconductor Diode and Digital Electronics	P-N junction diode, I-V characteristics in forward & reverse bias, diode as a rectifier; basic construction and I-V characteristics of LED, photodiode, solar cell. Zener diode: I-V characteristics, Zener diode as a voltage regulator. Bipolar junction transistor (BJT), transistor action, characteristics of a BJT, BJT as an amplifier (CE configuration) & oscillator. Logic gates (OR, AND, NOT, NAND & NOR) and their simple combinations