

LEVEL OF KNOWLEDGE EXPECTED FROM CANDIDATES

FOR PGTS

Equivalent to senior secondary classes and graduation for the topics of CSB written test syllabus

FOR TGTs

Equivalent to secondary and senior secondary classes for the topics of CSB written test syllabus

BREAKDOWN OF QUESTIONS WITH IN A SUBJECT

As mentioned in the syllabus for PGTs and TGTs (CSB written test)

RECOMMENDED STUDY MATERIAL

For TGTs

NCERT books of classes IX, X, XI & XII and reference books for secondary and senior secondary classes related to the topics mentioned in the syllabus

For PGTs

NCERT books of classes XI & XII and reference books for JEE, CBSE CPMT & graduation related to the topics mentioned in the syllabus

SYLLABUS (PGT PHYSICS)

- 1 **Units & measurements of physical quantities:** SI units, derived units, dimensions, dimensional analysis, error in measurements, methods of measurements and measuring devices (fundamental physical quantities). 3 marks
- 2 **Classical mechanics:** linear motion, motion in a plane (projectile, horizontal & vertical circular motion), laws of motion & their applications, force, linear & angular momentum, friction, torque, moment of inertia, theorems of moment of inertia, conservation of angular momentum, different types of energy, law of conservation of energy, power, different types of collisions, sources of energy, Newton's law of gravitation, gravity, gravitational potential, gravitational potential energy, Kepler's laws of planetary motion, motion of a satellite, binding energy of a satellite and escape velocity. 15 marks
- 3 **Properties of matter:** inter-atomic & inter-molecular distances, inter-atomic force, variation of potential energy with the distance between atoms/molecules, stress & strain, elastic constants, Hook's law, energy due to stress, fluid pressure, Archimedes principle, streamlined flow, Pascal's law, Bernoulli's theorem & its applications, Gas laws, kinetic theory of gasses, energy of gaseous molecules. 8 marks
- 4 **Heat:** thermometry, thermodynamics, laws of thermodynamics, thermal conduction & conductivity, convection, radiations, Newton's law of cooling, Stephen's & Plank's law of radiations, Carnot heat engine, refrigerator and thermal expansions. 5 marks
- 5 **Wave Mechanics:** oscillations, forced oscillations, resonance, simple harmonic motion, equation of a harmonic wave, overlapping / superposition of waves, reflection of mechanical waves, standing waves, Doppler's effect in sound, Musical notes and acoustics in buildings. 5 marks
- 6 **Electrostatics:** coulomb's law, electric field due to different types of distribution of charges, electric potential, electric potential energy, electric dipole, Gauss's theorem and its' applications, capacitors, different types of combination of capacitors and accelerators of charged particles. 5 marks
7. **Electrodynamics:** Ohm's law, specific resistance, nature of electrical conductors, thermoelectric effects, sources of electricity (AC & DC), Kirchhoff's laws of DC circuits and their applications, Wheatstone bridge, potentiometer, electrical measurements, electrical inductors and their combinations, electromagnetic induction, Faraday's laws, transformers, AC circuits, AC & DC motors and power of electrical circuits. 12 marks
8. **Magneto-statics:** motion of a charged particle in magnetic field, influence of magnetic field on a current carrying conductor, cyclotron, moving coil galvanometer, dc voltmeter, dc ammeter, Ampere's circuital law, solenoid, magnetic dipole, magnetic field, magnetic materials, elements of Earth's magnetism, electromagnets and magnetic hysteresis. 8 marks
9. **Optics:** Huygens wave theory, interference of electromagnetic & mechanical waves, diffraction of electromagnetic & mechanical waves, polarization of waves, scattering of light, dispersion of light, Laws of reflection & refraction, reflection at plane & spherical surfaces, refraction through plane & spherical surfaces, lenses, prisms, microscopes, telescope, resolving power of optical instruments and photometry. 10 marks

10. **Atomic Physics:** Einstein's photo electric effect and its applications, dual nature of radiations, De Broglie's wavelength, diffraction of electron beam (Davisson & Germer's experiment), Rutherford's atom model, structure of an atom, Bohr's theory, energy levels of electron of hydrogen atom, properties of nucleus, scattering of α particle, size of nucleus, nuclear forces, radioactivity, theory of α & β decay (fundamental), mean life & half life of a radioactive isotope, nuclear reactions and Atomic pile. 8 marks
11. **Electronics:** Intrinsic & extrinsic semiconductors, doping, junction diode, transistor, forward & reversed biasing, ICs, rectifiers, amplifiers, amplification factors, electronic oscillators, modulation (AM, FM & phase modulation), demodulation, binary number system, analog & digital signals, logic gates and truth table, 8 marks
12. **Electromagnetism:** Displacement current, Maxwell's equations, nature & speed of electromagnetic waves and Hertz's experiment, communication antenna, different means of communication, atmospheric layers and radio waves. 3 marks
- . **Practical Physics:** Vernier Calliper, Screw guage, Zero Error, Least Count and other practicals of XI & XII

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SYLLABUS (TGT PHYSICS)

1. **Units and measurements of physical quantities:** SI units, derived units, methods of measurements and measuring devices (fundamental physical quantities). 5 marks
2. **Classical mechanics:** linear motion, motion in a plane (projectile, horizontal circular motion), laws of motion & their applications, force, linear momentum, friction, moment of force, different types of energy, law of conservation of energy, power, sources of energy, Newton's law of gravitation, gravity, Kepler's laws of planetary motion and motion of a satellite. 15 marks
3. **Properties of matter:** inter-atomic & inter-molecular distances, inter-atomic force, stress & strain, elastic constants, Hook's law, fluid pressure, Archimedes principle, Pascal's law, Gas laws and kinetic theory of gasses. 8 marks
4. **Heat:** thermometry, thermodynamics, thermal conduction & conductivity, convection, radiations and thermal expansions. 6 marks
5. **Wave Mechanics:** oscillations, forced oscillations, resonance, simple harmonic motion, Musical notes and acoustics in buildings. 5 marks
6. **Electrostatics:** coulomb's law, electric field due to electrical charge, electric potential and electric dipole. 8 marks
7. **Electrodynamics:** Ohm's law, specific resistance, nature of electrical conductors, sources of electricity (AC & DC), electrical measurements, electrical resistance & combinations, transformers, electromagnetic induction, Faraday's laws, DC motors and power of electrical circuits. 15 marks
8. **Magneto-statics:** motion of a charged particle in magnetic field, influence of magnetic field on a current carrying conductor, galvanometer, voltmeter, dc ammeter, solenoid, magnetic dipole, magnetic field, magnetic materials and electromagnets. 5 marks
9. **Optics:** scattering of light, Laws of reflection & refraction, reflection at plane & spherical surfaces, refraction through plane & spherical surfaces, lenses, prisms, microscopes, telescope and human eye. 15 marks
10. **Atomic Physics:** Einstein's photoelectric effect, Rutherford's atom model, structure of an atom, Bohr's theory, properties of nucleus, scattering of α particle, size of nucleus, nuclear forces, radioactivity, isotopes, nuclear reactions and Atomic pile. 8 marks