

Test Series for CSIR-NET

Test Pattern

1. Chapter wise (CT), there are twenty five questions in each test and time duration is 1:30 Hour. Total number of test is 31.
2. Topic wise (PT), there are 40 questions in each test and time duration is 2:30 Hour. Total number of test is 10.
3. Full length test (FT), there are 75 questions in each test out of 75 questions 55 number of questions have to be attempt and time duration is 03:00 Hour. Total number of test is 5.
4. Student can attempt approximately 1400 number of questions. If students need details solutions then one should pay fees Rs. 1500/-

Test Schedule and Syllabus

Mathematical Physics		
Name of Test	Syllabus	Reference Book
CT-01	Dimensional analysis, Vector Algebra, Vector Calculus, Linear Algebra, Matrices , Tensor, Group theory	Pravega Class Notes, Mathematical Methods for Physicists by Arfkin, and Advanced Engineering Mathematics by Kreyszig
CT-02	ODE, Special Function, PDE, Green Function Series Random Variable	Pravega Class Notes, Mathematical Methods for Physicists by Arfkin, and Advanced Engineering Mathematics by Kreyszig
CT-03	Fourier Series, Fourier Transform, Laplace Transform, Complex function, Numerical Analysis	Pravega Class Notes, Mathematical Methods for Physicists by Arfkin, Advanced Engineering Mathematics by Kreyszig and Introductory methods of numerical analysis by S.S. Sastry (For numerical Analysis)
PT-01	Syllabus of Mathematical Physics	Above mentioned

Classical Mechanics		
Name of Test	Syllabus	Reference Book
CT-04	Newton's law dynamical system, Phase curve, Stability analysis, Central force, Collision and Classical Scattering	Pravegaa Class Notes, An Introduction to Mechanics by Daniel Kleppner and Robert Kolenkow and Classical Mechanics by Goldstein
CT-05	Rigid body, Moment of Inertia Tensor, Non- Inertial Frame, STR-Lorentz, Small Oscillation	Pravegaa Class Notes, Introduction to Special Relativity by Robert Resnick and Classical Mechanics by Goldstein
CT-06	Generalised Coordinate Lagrangian and Hamiltonian Formulation, Canonical Transformation, Poisson Bracket , Generating Function , Noether Equation	Pravegaa Class Notes and Classical Mechanics by Goldstein
PT-02	Syllabus of Classical Mechanics	Above Mentioned

Electromagnetic Theory		
Name of Test	Syllabus	Reference Book
CT-07	Electrostatic Force, Gauss Law, Laplace and Poission Equation, Boundaries Value Problem	Pravegaa Class Notes, Introduction to Electrodynamics by David J Griffith
CT-08	Magnetostate-Biot Savart Law, Amperes Law , EM Induction	Pravegaa Class Notes, Introduction to Electrodynamics by David J Griffith
CT-09	Dynamics of Charge Particle, Particle in Static and Uniform EM Field	Pravegaa Class Notes, Introduction to Electrodynamics by David J Griffith
CT-10	Em wave in free space , Dielectric and conductor, Reflection and refraction polarisation, Fresnel law, Interference, Coherence and Diffraction	Pravegaa Class Notes, Introduction to Electrodynamics by David J Griffith And Problems and Solutions in Electromagnetics
CT-11	Dispersion in Plasma, Lorentz in Variance of Maxwell Equation Transmission Line and Wave Guide, Radiation from Moving Charge Dipoles and Retarded Potential	Pravegaa Class Notes, Introduction to Electrodynamics by David J Griffith
PT-03	Syllabus of Electromagnetic Theory	Above Mentioned

Quantum Mechanics		
Name of Test	Syllabus	Reference Book
CT-12	Wave particle duality, Schrödinger equation, (Tools and postulates of quantum mechanics). Wave function in coordinate and momentum representation, commutators and Heisenberg. Uncertainty principles and Dirac notation	Pravega Class Notes, Introduction to Quantum Mechanics by David J Griffith, Quantum Mechanics: Concepts and Applications by Nouredine Zetli and Principles of Quantum Mechanics by Ramamurti Shankar
CT-13	Eigen value problems (Particle in box, Harmonic Oscillator, Tunneling through barrier, Dirac delta function) and 2D and 3D systems in Cartesian coordinates	Pravega Class Notes, Introduction to Quantum Mechanics by David J Griffith, Quantum Mechanics: Concepts and Applications by Nouredine Zetli and Principles of Quantum Mechanics by Ramamurti Shankar
CT-14	Motion in central potential, Orbital angular momentum, Angular momentum algebra, Spin, The addition of angular momentum, Hydrogen atom, The Stern-Gerlach experiment	Pravega Class Notes, Introduction to Quantum Mechanics by David J Griffith, Quantum Mechanics: Concepts and Applications by Nouredine Zetli and Principles of Quantum Mechanics by Ramamurti Shankar
CT-15	Time dependent and independent perturbation, Variation principle, WKB approximation, Fermi golden rule	Pravega Class Notes, Introduction to Quantum Mechanics by David J Griffith, Quantum Mechanics: Concepts and Applications by Nouredine Zetli and Principles of Quantum Mechanics by Ramamurti Shankar
CT-16	Theory of scattering, Pauli-exclusion principle, Identical particles, Relativistic quantum mechanics,	Pravega Class Notes, Introduction to Quantum Mechanics by David J Griffith, Quantum Mechanics: Concepts and Applications by Nouredine Zetli and Principles of Quantum Mechanics by Ramamurti Shankar
PT-04	Syllabus of Quantum Mechanics	Above Mentioned

Thermodynamics and Statistical Mechanics		
Name of Test	Syllabus	Reference Book
CT-17	Law of thermodynamics and their consequences, Thermodynamic potential, Maxwell relation, Chemical potential,	Pravega Class Notes, Statistical Mechanics by R.K Patharia and Paul D. Beale and Thermal Physics by S.C. Garg, R.M. Bansal & C.K. Ghosh
CT-18	Phase space, Micro and macro state, Micro canonical, Canonical, Grand canonical and partition function Free energy and connection with thermodynamic quantities,	Pravega Class Notes, Statistical Mechanics by R.K Patharia and Paul D. Beale and Thermal Physics by S.C. Garg, R.M. Bansal & C.K. Ghosh
CT-19	Classical and quantum statistics, Ideal bose and Fermi gas, Principle of detailed balance, Black body radiation and Planck's distribution	Pravega Class Notes, Statistical Mechanics by R.K Patharia and Paul D. Beale and Thermal Physics by S.C. Garg, R.M. Bansal & C.K. Ghosh
CT-20	First and second order transition, Dia, para and ferro magnetism, Ising model, Bose Einstein condensation, diffusion Equation, Brownian motion and random walk problem, Introduction to non equilibrium process	Pravega Class Notes, Statistical Mechanics by R.K Patharia and Paul D. Beale and Thermal Physics by S.C. Garg, R.M. Bansal & C.K. Ghosh
PT-05	Syllabus of Thermodynamics and Statistical Mechanics	Above Mentioned

Electronics and Devices Electronics		
Name of Test	Syllabus	Reference Book
CT-21	Network Analyses, Diodes, Zener Diode	Pravega Class Notes, Elements of Electromagnetics by Matthew N.O Sadiku
CT-22	Transistor, BJT, FET	Pravega Class Notes, Essentials of circuit analysis by Robert Boylestad
CT-23	Op-Amp, Inverting , Non-Inverting , Integrator, Differentiator, Basic properties Op-Amp, High pass, Low-pass , Band pass, band reject, Feed-back (Positive and negative), Oscillators.	Pravega Class Notes, Essentials of circuit analysis by Robert Boylestad
CT-24	Digital, Logic gate, K-Maph, Counters, A/D and D/A converters, Multiplexer and De multiplexer, Binary addition and subtraction	Pravega Class Notes, Essentials of circuit analysis by Robert Boylestad
CT-25	Error Analysis	Pravega Class Notes, Essentials of circuit analysis by Robert Boylestad
PT-06	Syllabus of Electronics and Devices Electronics	Above Mentioned

Atomic and Molecular Physics		
Name of Test	Syllabus	Reference Book
CT-26	Quantum state of electron in an atom, Electron spin, The spectrum of He and Alkaline atoms, Relativistic correction For energy level of Hydrogen atom, Hyperfine structure, Isotopic shift, Width of spectrum lines, LS and JJ coupling Zeeman, Paschen and Stark effect, ESR and NMR spectrum	Pravega Class Notes, The Fundamentals of Atomic and Molecular Physics by Robert L Brooks
CT-27	Frank Condon Principle, Born Oppenheimer approximation, Electronic, rotational, Vibrational and Raman Spectrum of diatomic molecules, Selection rules and Laser (Spontaneous, stimulated emission and absorption, Einstein coefficient, Optical pumping, Population inversion, Rate equation, Modes of resonator and coherence length)	Pravega Class Notes, Fundamentals of Molecular Spectroscopy by C.N. Banwell, Laser Fundamentals and Applications by Ajoy Ghatak
PT-07	Syllabus of Atomic and Molecular Physics	Above Mentioned

Condensed Matter Physics		
Name of Test	Syllabus	Reference Book
CT-28	Crystal structure, XRD, reciprocal lattice, Lattice vibration	Pravega Class Notes, Introduction to solid state physics by Charles Kittel and Solid State Physics by N. David Mermin and Neil Ashcroft
CT-29	Heat Capacity, Density of states, Free electron theory, Band theory, Tight binding Approximation, Magnetism, Superconductivity	Pravega Class Notes, Introduction to solid state physics by Charles Kittel and Solid State Physics by N. David Mermin and Neil Ashcroft
PT-08	Syllabus of Solid State Physics	Above Mentioned

Nuclear and Particle Physics		
Name of Test	Syllabus	Reference Book
CT-30	Basics properties of nucleus, Binding energy, Liquid drop model, Shell model, Collective model, Nuclear magnetic moment	Pravega Class Notes, S.N Ghosal
CT-31	Nuclear reaction, Radio activity and particle physics	Introduction to Elementary Particles by David J. Griffiths and The Ideas of Particle Physics by <u>G. D. Coughlan</u>
PT-09	Syllabus of Nuclear and Particle Physics	Above Mentioned

General Aptitude		
Name of Test	Syllabus	Reference Book
PT - 10	Plane Figure, Solid Shapes, Number System, Algebra, Average, Boats and Streams, Calendar, Clocks, Coordinate Geometry, Ratio	Pravega Class Notes

Full Length Test	
Full Test	Syllabus
FT – 01	Full Syllabus of Net
FT - 02	Full Syllabus of Net
FT - 03	Full Syllabus of Net
FT - 04	Full Syllabus of Net
FT - 05	Full Syllabus of Net

- **Date and Schedule can be modified according to notification of examination**