Explore Physics By Himanshu

Centre of Excellence | Physical Science

(CSIR-NET JRF, GATE, JEST, BARC, TIFR, IIT JAM, RPSC Asst. Professor)

Joint Entrance Screening Test (JEST)

EXAM PATTERN

- The exam is conducted through offline mode in OMR answer sheet.

- There is a total of 50 objective questions of 100 marks. The exam duration is 3 hours.

- The exam will consist of 3 Parts: Part A, Part B and Part C.

Part A consists of 15 questions which will carry 3 marks each.

Part B consists of 10 questions which will carry 3 marks each.

Part C consists of 25 questions which will carry 1 mark each.

For Part A: 3 marks will be rewarded for every correct answer and 1 mark will be deducted for every wrong answer.

For Part B: 3 marks will be awarded for every correct answer. There is no negative marking in this Part.

Fort Part C: 1 mark will be awarded for every correct answer and 1/3 mark will be deducted for every wrong answer.

SYLLABUS

Mathematical Methods

Vector algebra and vector calculus, tensors, curvilinear coordinate systems, linear algebra; Linear differential equations, elements of Sturm–Liouville theory; Special functions; Complex analysis; Fourier series and Fourier transforms, Laplace transforms; Elementary properties of discrete groups; Elements of probability theory, error analysis.

Classical Mechanics

Newton's laws, conservation of energy and momentum, collisions; generalized coordinates, principle of least action, Lagrangian and Hamiltonian formulations of mechanics; Symmetry and conservation laws; central force problem, Kepler problem; Small oscillations and normal modes; special relativity in classical mechanics.

Electromagnetism & Optics

Electrostatics and magnetostatics, boundary value problems, multipole expansion; Fields in conducting, dielectric, diamagnetic and paramagnetic media; Faraday's law and time varying fields; displacement current; Maxwell's equations; energy and momentum of electromagnetic fields; Propagation of plane electromagnetic waves, reflection, refraction; Electromagnetic waves in dispersive and conducting media; diffraction, interference, polarization.

Quantum Mechanics

Uncertainty principle; Schrodinger equation; central potentials, hydrogen atom; Orbital and spin angular momenta, addition of angular momenta; Matrix formulation of quantum theory, unitary transformations, Hermitian operators; Variational principle, time independent perturbation theory, time dependent perturbation theory.

Thermodynamics & Statistical Physics

Laws of thermodynamics, work and heat, thermodynamic potentials; Elements of kinetic theory; Maxwell's relations; Statistical ensembles; partition function; classical ideal gas, harmonic oscillators; Classical and quantum statistics; Fermi and Bose gases; black body radiation; statistics of paramagnetism.

Electronics

Basics of semiconductor; p-n junctions, diodes, transistors; LCR circuits, rectifiers, amplifiers, active filters and oscillators; basics of OPAMPs and their applications; basics of digital electronics.