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| 1 | Describe the Laws of Thermodynamics. | №1 |
| 2 | Describe Thermodynamic Potentials. | №1 |
| 3 | Explain operators and inverse operators, the uncertainty principle and the principle of superposition, matrices. | №1 |
| 4 | Describe schrödinger equation, flux density, linear oscillator, potential box, the transmission coefficient. | №1 |
| 5 | Explain energy and momentum | №1 |
| 6 | Explain transformation matrices, matrix density. | №1 |
| 7 | Explain and describe angular momentum, eigenvalues and eigen functions, parity states. | №1 |
| 8 | Describe the motion in a centrally symmetric field. | №1 |
| 9 | Describe spherical coordinates, decomposition in plane waves. | №1 |
| 10 | Explain Electrostatic and Gravitational Fields. | №1 |
| 11 | Explain and describe Conductors, Semiconductors, Isolators. | №1 |
| 12 | Explain Gauss’s Law for Electric Fields. | №1 |
| 13 | Explain Gauss’s Law for Magnetism. | №1 |
| 14 | Describe Maxwell’s Equations. | №1 |
| 15 | Describe Lorentz Force. | №1 |
| 16 | Describe fields in a Medium. | №2 |
| 17 | Explain and describe Diamagnetism, Paramagnetism and Ferromagnetism. | №2 |
| 18 | Describe Black Body Radiation. | №2 |
| 19 | Decsribe dispersion of Light. | №2 |
| 20 | Explain and describe reflection and refraction. | №2 |
| 21 | Describe the wave function. | №2 |
| 22 | Explain Operators and States in Quantum Mechanics. | №2 |
| 23 | Describe Harmonic Oscillator. Ladder Operators. | №2 |
| 24 | Explain and describe emission and absorption of radiation. Tunnel. | №2 |
| 25 | Explain exchange Interaction. | №2 |
| 26 | Describe exchange energy and ferromagnetism. | №2 |
| 27 | Explain and describe paradoxes in quantum mechanics. | №2 |
| 28 | Describe Schrodinger Cat. | №2 |
| 29 | Describe quantized fields and particles. | №2 |
| 30 | Describe Dirac Equation. | №2 |
| 31 | Describe and explain quantum electrodynamics. Unitarity. | №3 |
| 32 | Describe Feynman Diagrams. | №3 |
| 33 | Explain and describe real and virtual particles in Feynman diagrams. | №3 |
| 34 | Describe Compton Scattering, the formation of electron-positron pairs. | №3 |
| 35 | Describe principle of Gauge Invariance. CPT Symmetry. | №3 |
| 36 | Explain Electron Self-energy. Vacuum Polarization. | №3 |
| 37 | Explain and describe theory of Weak Interactions. | №3 |
| 38 | Dsecribe Yang Mills Fields. | №3 |
| 39 | Describe Nambu-Goldstone Theorem. | №3 |
| 40 | Explain and describe quantum numbers. Parity. C, P and T transformations. | №3 |
| 41 | Explain Higgs Mechanism, Glashow Salam-Weinberg Model. | №3 |
| 42 | Explain Neutrino Oscillations and Masses. | №3 |
| 43 | Describe and explain Hadrons and Quarks, Quantum Chromodynamics. | №3 |
| 44 | Dsecribe Grand Unification. | №3 |
| 45 | Explain inflation, supersymmetry, superstrings. | №3 |