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Study Plan of Thermodynamics and Statistical Physics for Pre-recorded Batches

(For NET-JRF, GATE, JEST, TIFR Aspirant and M.Sc Students)

Topic no.- 5. Kinetic Theory of Gases, Thermodynamics & Statistical Mechanics

DAY	DATE	PART-A: (Kinetic Theory of Gases, Thermodynamics)
Day: 1		Lecture 1: Preliminaries Part-1 (Kinetic Theory of Gases)
		Lecture 2: Preliminaries Part-2 (Kinetic Theory of Gases)
Day: 2		Lecture 3: K.T.G Part-1 (Kinetic Theory of Gases)
		Lecture 4: K.T.G Part-2 (Heat Capacity of a Gas) (Kinetic Theory of Gases)
Day: 3		Lecture 5: K.T.G Part-3 (Maxwell-Boltzmann Distribution of Speed) (Kinetic Theory of Gases)
		Lecture 6: K.T.G Part-4 (Problems) (Kinetic Theory of Gases)
Day: 4		Lecture 7: K.T.G Part-5 (Molecular Distribution, Pressure, Effusion) (Kinetic Theory of Gases)
		Lecture 8: K.T.G Part-6 (Mean Free Path and Collisions) (Kinetic Theory of Gases)
Day: 5		Lecture 9: K.T.G Part-7 (Transport Properties in Gases) (Kinetic Theory of Gases)
		Class Test 1: Kinetic Theory of Gases and Maxwell Boltzmann Distribution Law (Thermodynamics & Statistical Mechanics)
Day: 6		Lecture 10: Thermodynamics (Basic Definitions) (Thermodynamics)
		Lecture 11: First Law of Thermodynamics (Thermodynamics)
Day: 7		Lecture 12: Miscellaneous Examples on First Law (Thermodynamics)
		Lecture 13: Second Law of Thermodynamics and Heat Engines (Thermodynamics)
		Class Test 2: Transport Phenomenon, Real Gases, First and Second Law (Thermodynamics and Statistical Mechanics)
Day: 8		Lecture 14: Entropy (Thermodynamics)
		Lecture 15: Joule Expansion (Free Expansion of Gas) (Thermodynamics)
Day: 9		Lecture 16: Miscellaneous Examples on Entropy (Thermodynamics)
		Lecture 17: Thermodynamic Potentials (Thermodynamics)
Day: 10		Lecture 18: Maxwell's Relation (Thermodynamics)
		Lecture 19: Thermodynamics of Rods, Bubbles amd Magnets (Thermodynamics)
Day: 11		Lecture 20: Third Law of Thermodynamics (Thermodynamics)
		Lecture 21: Real Gases Part-1 (Thermodynamics)
Day: 12		Lecture 22: Real Gases Part-2 (Thermodynamics)
		Lecture 23: Cooling of Real Gases (Thermodynamics)
Day: 13		Lecture 24: Clausius Clapeyron Equations (Thermodynamics)
		Lecture 25: Chemical Potential and Phase Changes (End of Kinetic Theory of Gases, and Thermodynamics)
		Class Test 3: Entropy, Thermodynamic Potentials, Maxwell Relations (Thermodynamics and Statistical Mechanics)
		PART-B: Statistical Mechanics
Day: 14		Lecture 1: Fundamental of Statistical Mechanics Part-1 (Statistical Mechanics)
		Lecture 2: Fundamental of Statistical Mechanics Part-2 (Statistical Mechanics)
Day: 15		Lecture 3: Classical and Quantum Statistics (Statistical Mechanics)
		Lecture 4: The Statistical Basis of Thermodynamics (Statistical Mechanics)
Day: 16		Lecture 5: Problems on the Statistical Basis of Thermodynamics (Statistical Mechanics)
		Lecture 6: Microstates in Phase Space(Classical Ideal Gas) (Statistical Mechanics)
Day: 17		Lecture 7: Calculation of Microstates in Three Different Cases (Statistical Mechanics)
		Lecture 8: Classical Idael Gas in Microcanical Ensemble (Statistical Mechanics)
Day: 18		Lecture 9: The entropy of mixing and the Gibbs paradox (Statistical Mechanics)
		Lecture 10: The Canonical Ensemble Part-1 (Statistical Mechanics)
Day: 19		Lecture 11: The Canonical Ensemble Part-2 (Problems) (Statistical Mechanics)
		Lecture 12: The Canonical Ensemble Part-3 (Problems) (Statistical Mechanics)
Day: 20		Lecture 13: The Canonical Ensemble Part-4 (Problems) (Statistical Mechanics)
		Lecture 14: The Canonical Ensemble Part-5 (The Classical Sysytem) (Statistical Mechanics)
Day: 21		Lecture 15: The Canonical Ensemble Part-6 (The Classical Sysytem+H.O.) (Statistical Mechanics)
		Lecture 16: The Canonical Ensemble Part-7 (Problems) (Statistical Mechanics)
Day: 22		Lecture 17: The Canonical Ensemble Part-8 (Problems) (Statistical Mechanics)
		Lecture 18: The Canonical Ensemble Part-9 (Statistical Mechanics)
Day: 23		Lecture 19: The Canonical Ensemble Part-10 (Statistical Mechanics)
		Lecture 20: The Canonical Ensemble Part-11 (Statistical Mechanics)

Topic no.- 5. Kinetic Theory of Gases, Thermodynamics & Statistical Mechanics		
Day: 24		Lecture 21: The Canonical Ensemble Part-12 (Fluctuations in Energy) (Statistical Mechanics)
		Lecture 22: The Canonical Ensemble Part-13 (Ideal Diatomic Gas) (Statistical Mechanics)
		Class Test 4: Canonical Ensemble (Thermodynamics and Statistical Mechanics)
Day: 25		Lecture 23: Interacting Systems Part-1 (Einstein Model of Solid) (Statistical Mechanics)
		Lecture 24: Interacting Systems Part-2 (Paramagnetism) (Statistical Mechanics)
Day: 26		Lecture 25: Thermodyanamics of Magnetic System Part-1 (Statistical Mechanics)
		Lecture 26: Thermodyanamics of Magnetic System Part-2 (Statistical Mechanics)
Day: 27		Lecture 27: Ising Model Part-1 (Statistical Mechanics)
		Lecture 28: Ising Model Part-2 (Statistical Mechanics)
Day: 28		Lecture 29: Ising Model Part-3 (Statistical Mechanics)
		Lecture 30: Landau Theory (Statistical Mechanics)
Day: 29		Lecture 31: Blackbody Radiation(Partition Function Approach) (Statistical Mechanics)
		Lecture 32: Degenerate Gas Part-1 (Statistical Mechanics)
Day: 30		Lecture 33: Degenerate Gas Part-2 (Statistical Mechanics)
		Lecture 34: Classical and Quantum Statistics (Statistical Mechanics)
Day: 31		Lecture 35: Bose Einstein Condensation (Statistical Mechanics)
		Lecture 36: Blackbody Radiation (Statistical Mechanics)
		Class Test 5: Blackbody Radiation and Elementary Statistical Mechanics (Thermodynamics and Statistical Mechanics)
Day: 32		Lecture 37: Rayleigh-Jeans Law (Statistical Mechanics)
		Lecture 38: Planck's Law Part-1 (Statistical Mechanics)
Day: 33		Lecture 39: Planck's Law Part-2 (Statistical Mechanics)
		Lecture 40: Random Walk Problem Part-1 (Statistical Mechanics)
Day: 34		Lecture 41: Random Walk Problem Part-2 (Statistical Mechanics)
		Lecture 42: Random Walk Problem Part-3 (End of Statistical Mechanics)
Day: 35		Class Test 6: Random Walk Problem and Micro Canonical Ensemble (Thermodynamics and Statistical Mechanics)
		Class Test 7: Quantum Statistics (Thermodynamics and Statistical Mechanics)
Day: 36		Class Test 8: Phase Transition and Grand Canonical Ensemble (Thermodynamics and Statistical Mechanics)