

Lesson Plan (2022-23) Odd Semester

Class B.Sc. IInd

Name of Teacher Dr. MANOJ KUMAR

Month	Week	Topic
Aug.		Computer Programming, Binary representation.
Sept	1 st week	Algorithm development, flow charts and their interpretation
	2 nd week	Fortran Preliminaries: Integer & Floating pt. arithmetic expression, builtin functions, executable & non-executable statements, IF, DO & GO TO statements
	3 rd week	Carnot cycle, Carnot theorem, Second law of thermodynamics, Kelvin Absolute scale of temp., Entropy, T-S Diagram, Joule Thomson effect, Liquefaction & P & v curve experiment
	4 th week	Derivation of Clausius - Clapeyron latent heat eq.
	5 th week	Phase Diagram & triple pt. of a substance
Oct.	1 st week	Maxwell thermodynamical relations & Applications
	2 nd week	Thermodynamic function Internal energy, Enthalpy, Helmholtz function & Gibbs function & their relation b/w
	3 rd week	Speed of transverse waves on a uniform string.
	4 th week	Speed of longitudinal wave in fluid, superposition of waves. Fourier Analysis of complex waves.
	5 th week	Application (i) Sol ⁿ of triangular & rectangular waves, half wave & full wave rectifier O/P. Fourier transform & its properties
Nov.	1 st week	Application of Fourier transform (i) $f(x) = e^{-x^2}$ (ii) $f(x) = \begin{cases} (x) < 0 \\ 0 < (x) < a \\ 0 < (x) > a \end{cases}$
	2 nd week	Matrix method in paraxial optics, effects of translation & refraction.
	3 rd week	Derivation of thin lens & thick lens formulae, unit plane, nodal planes.
	4 th week	System of thin lens. Chromatic spherical, coma, astigmatism & Distortion aberrations & their remedies
	5 th week	Revision and test of unit (i) & unit (ii) of paper II nd
Dec.	1 st week	Interference by Division of wavefront: - Fresnel's Biprism.
	2 nd week	& its Applications to determine of wavelength of Sodium light.
	3 rd week	Thickness of mica sheet, Lloyd's mirror
	4 th week	Difference b/w Fresnel Biprism & Lloyd's Mirror Stoke's law of phase change on Reflection
	5 th week	Test & Revision

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Lesson Plan (2022-23) Odd Semester

Class B.Sc. IIIrd year

Name of Teacher D. MANOJKUMAR

Month	Week	Topic
Aug.	1 st week	Failure of (classical) E.m. theory, old Quantum theory Photoelectric effect & Einsteins photoelectric eq ⁿ , Compton effect, De-broglie hypothesis, Davison & Germer's experiment C.P. Thomson Experiment, phase velo, group velo, Heisenberg's Uncertainty principle from De-broglie wave, Compton's eq ⁿ Microscope, Electron Diffraction from a slit.
	2 nd week	Derivation of time dependent & independent Schrodinger wave eq ⁿ Eigen value, eigen function & independent Schrodinger wave eq ⁿ Wave function & its significance, Normalization of wave function.
Sept.	3 rd week	Harmonic Oscillator
	4 th week	Applications of Schrodinger eq ⁿ in the sol ⁿ of 1-D problems.
	5 th week	Free Particle in 1-D box (sol ⁿ of Schrodinger wave eq ⁿ) Eigen function, eigen value, Quantization of energy.
Oct.	1 st week	1-D Potential barrier $E > V_0$
	2 nd week	1-D potential barrier $E < V_0$ (Reflection coefficient penetration of leakage co-efficient, penetration depth.)
	3 rd week	Crystalline & glassy forms, liquid crystals.
	4 th week	Crystal structure, Periodicity, lattice & basis
Nov.	5 th week	Crystal translational vectors and axes. Unit cell and primitive cell, wigner cells
	1 st week	Primitive cell, Symmetry operations for a two-D crystal Bravais lattice in 2D & 3D & revision of unit cell Paper (1st)
	2 nd week	Crystal plane and Miller indices, interplanar spacing, Crystal structure of Zinc sulphide
	3 rd week	Sodium Chloride and Diamond. X-ray diffraction Bragg's law and experiment X-ray diffraction
	4 th week	K-space.
Dec.	5 th week	Reciprocal lattice and its physical significance. Reciprocal lattice vectors, reciprocal lattice due to a simple cubic lattice.
	1 st week	Reciprocal lattice to a body centered cubic (b.c.c.) and face centered cubic f.c.c.
	2 nd week	Specific heat :- Specific heat of solids Einstein theory of specific heat.
	3 rd week	Debye model of specific heat of solids.
	4 th week	Revision & Test of unit I & II and of paper II and (QUANTUM MECHANICS)
	5 th week	Revision & Test.

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Lesson Plan (2022-23) Odd Semester

Class B.Sc. Ist

Name of Teacher Dr. MANOJ KUMAR

Aug.		
Sept	1 st week	Mechanics of Single & System of Particles.
	2 nd week	Conservation of laws of linear momentum, angular momentum and energy for a single Particle. Conservation laws for system of Particles.
	3 rd week	Constrained Motion, Degree of freedom.
	4 th week	Generalised coordinates, Displacement, velo, acceleration, momentum, force and Potential. Hamilton's variational principle.
	5 th week	Lagrange's eq ⁿ of motion from Hamilton's Principle. Linear Harmonic Oscillator, simple Pendulum, Atwood's machine.
Oct.	1 st week	Rotation of Rigid body, Moment of inertia, Torque, Angular Momentum, K.E. energy of rotation.
	2 nd week	Theorems of parallel and perpendicular axes with proof. M.O.I. of Solid sphere, spherical shell, Solid cylinder, hollow.
	3 rd week	Solid bar rectangular cross-section. Acceleration of a Body rolling down an inclined Plane.
	4 th week	Scalars & vectors, dot & cross product, Triple vector product.
	5 th week	Scalar & vector fields, Differentiation of a vector. Gradient of a scalar & its physical significance.
Nov.	1 st week	Integration of vector, Gauss's Divergence theorem, Stokes's theorem.
	2 nd week	Derivation of \vec{E} from potential as gradient, Derivation of Laplace's & Poisson's eq ⁿ . Flux, Gauss's law & its application to spherical shell, uniformly charged infinite plane & uniformly charged straight wire, energy per unit vol.
	3 rd week	Magnetic Induction, Magnetic flux, Properties of \vec{B} ;
	4 th week	(i) $\nabla \cdot \vec{B} = 0$ (ii) $\nabla \times \vec{B} = \mu_0 \vec{J}$, Electrostatic theory of dia and paramagnetism, Domain theory of ferromagnetism (Langevin's theory), Cycle of magnetisation.
	5 th week	Hysteresis loop (Energy dissipation), Hysteresis loss.
Dec.	1 st week	Maxwell eq ⁿ . & their derivation, Displacement current, vector & scalar Potential.
	2 nd week	Boundary conditions at interface b/w two different media. Propagation of electromagnetic wave. Integral & differential form of Maxwell eq ⁿ .
	3 rd week	Poynting vector and Poynting theorem (revision).
	4 th week	Revision & Test.
	5 th week	

Paper II