

PANIPAT INSTITUTE OF ENGINEERING & TECHNOLOGY

Department of Applied Sciences and Humanities

Subject Name: - SEMICONDUCTOR PHYSICS

Year/Semester: 1st/ IInd

Subject Code: BS-115A

LESSON PLAN

Lecture No.	Topics To Be Covered	Tentative Date	COURSE OUTCOME
	UNIT I Crystal Structure		CO1
L 1	Crystal Structure: Crystalline and Amorphous solids, Crystal Structure:	14/02/23	
L 2	lattice translation vector, symmetry operations, space lattice, basis	16/02/23	
L 3	Unit cell and Primitive cell, Fundamental types of lattices: two-dimensional	17/02/23	
L 4	three dimensional Bravais lattices; Characteristics of Unit cells	27/02/23	
L 5	Simple Cubic (SC)	28/02/23	
L 6	Bravais Lattices	2/03/23	
L 7	Body Centred Cubic (BCC),	3/03/23	
L 8	Face Centred Cubic (FCC)	4/03/23	
Content beyond Syllabus	Grain and grain boundary	9/03/23	
L 9	Hexagonal Close Packed (HCP) structure	10/03/23	
L 10	Simple crystal structures: Sodium Chloride, Cesium Chloride,	13/03/23	
L 11	Diamond,	14/11/23	
L 12	Various crystal structures	15/03/23	

L 13	Cubic Zinc Sulfide	16/03/23	
L 14	Miller Indices	17/03/23	
L 15	Bonding in Solids	18/03/23	
L 16	Point defects in crystals: Schottky and Frenkel defects.	20/03/23	
L 17	Drawing of Miller Planes	21/03/23	
L 18	Point defects in crystals: Schottky and Frenkel defects.	24/03/23	
L 19	Revision	25/03/23	
	Unit – II Quantum Theory		CO2
L 20	Need and origin of Quantum concept	31/03/23	
L 23	Wave-particle duality	3/04/23	
L 22	Wave-particle duality	4/04/23	
L 23	Phase velocity and group velocity	6/04/23	
L 24	DISCUSSION OF ASSIGNMENT - 1	7/04/23	
L 25	Uncertainty Principle	10/04/23	
L 26	Applications	11/04/23	
L 27	Schrodinger's wave equation: time-dependent	13/04/23	
L 28	time –independent; Physical Significance of wave function ψ .	14/04/23	
L 29	Revision of unit - II	17/04/23	
L 30	Revision of unit - II	18/04/23	
L 31	PROBLEMS	19/04/23	
Content beyond	Particle control in Quantum Mechanics	20/04/23	

	UNIT III		CO3
L 32	Band theory of Solids: Bloch theorem, Kronig-Penney Model (qualitative)	21/04/23	
L 33	CONT..... , Kronig-Penney Model	24/04/23	
L 34	E versus k diagram	25/04/23	
L 35	K P MODEL	27/04/23	
L 36	Brillouin Zones	28/04/23	
L 37	Concept of effective mass of electron	4/05/23	
L 38	Energy levels and energy bands	5/05/23	
L 39	Distinction between metals, insulators and semiconductors	8/05/23	
L 40	Discussion on Semiconductors	9/05/23	
L 41	Hall effect and its Applications	11/05/23	
L 42	Free Electron Theory: Classical free electron theory: electrical conductivity in metals, thermal conductivity in metals,	12/05/23	
L 43	Wiedemann-Franz law	15/05/23	
L 44	Discussion of Assignment - 2	16/05/23	
L 45	success and drawbacks of free electron theory	18/05/23	
L 46	Quantum free electron theory: wave function, eigen values	19/05/23	
L 47	Density of states	22/05/23	
L 48	Fermi-Dirac distribution function	23/05/23	
L 49	Fermi energy and its importance, Thermionic Emission (qualitative).	25/05/23	

	UNIT-IV		CO4
L 50	Semiconductors: Conduction in Semiconductors	26/05/23	
L 51	, Intrinsic Semiconductors: Conductivity of charge carriers,	29/05/23	
L 52	Carrier concentration in intrinsic semiconductors	30/05/23	
L 53	Discussion - Applications of semiconductor	1/06/23	
L 54	Extrinsic Semiconductors: n-type semiconductors, p-type semiconductors	2/06/23	
L 55	charge carrier concentration in extrinsic semiconductors	5/06/23	
Content beyond Syllabus	Introduction to lasers	6/06/23	
L 56	Semiconductor Devices: The p-n junction, Current-voltage characteristics of p-n junction	8/06/23	
L 57	The Transistor: Bipolar Junction Transistor (BJT)	9/06/23	
L 58	Field Effect Transistor (FET)	12/06/23	
L 59	Metal-Semiconductor Junction (Ohmic and Schottky); Semiconductor Laser.	13/06/23	