

SARASWATI MAHILA MAHAVIDHYALAYA, PALWAL

LESSON-PLAN

Class: Msc physics first year

Semester: II

Subject: solid state physics

Session: 2020-21

Lecture Number	Topic
1	Unit-I crystalline solid, lattice, the basis, lattice translation
2	Vectors , direct lattice, two and three dimensional Bravais lattice
3	Conventional unit cell of FCC, BCC,
4	BLACK, CsCL, Diamond and cubic ZnS
5	Primitive lattice cell of FCC,BCC and HCP
6	Closed packed structure: packing fraction of simple cubic
7	BCC, FCC, hcp and diamond structure
8	Revision Test
9	Interaction of x- rays with matter
10	Absorption of x-rays,
11	Elastic scattering from a perfect lattice
12	The reciprocal lattice and it's application to diffraction techniques
13	Ewalds construction
14	The laye, powder and rotating crystal method
15	Atomic form factor, crystal structure factor and intensity of diffraction maxima
16	Crystal structure factors of bcc,FCC
17	Monoatomic diamond lattice, polyatomic CuZn
18	Assignment of unit -I
19	Revision of unit -I

20	Numerical practice session
21	Numerical test
22	Numerical assignment
23	Unit - II vibration of one dimensional mono and diatomic chains
24	Phonon momentum, density of normal mode in one and three dimensional
25	Quantization of lattice vibration
26	Measurements of phonon dispersion using in elastic neutron scattering
27	Point defects, line defect and planar faults
28	Fundamental ideas of the role of dislocation in plastic deformation
29	Revision Test of above topic
30	Crystal growth
31	Numerical practice
32	Numerical practice session
33	Observation in imperfections in crystals
34	x-Rays and electron microscopic techniques
35	Test of unit -II
36	Assignment of unit -II
37	Revision of unit-II numerical
38	Unit -III Electron in periodic lattice
39	Block theorem kronig penny model and band theory
40	Classification of solids
41	Effective mass

42	Weak binding method and it's application to linear lattice
43	Tight binding method
44	And it's application to cubic BCC
45	FCC crystal
46	Concept of holes
47	Fermi surface construction of Fermi surface in two dimensions
48	De hass van alfen effect
49	Cyclotron resonance
50	Magneto - resistance
51	Revision unit test -III
52	Numerical test
53	Numerical practice session
54	Assignment of unit III
55	Whole unit revision Test of unit - III
56	Revision Test of unit III
57	Unit - IV Weiss theory of ferromagnetic
58	Heisenberg model and molecular field theory of ferromagnetic of spin waves and magnons
59	Revision of above topic
60	Curie Weiss law for susceptibility
61	Ferriand anti ferro magnetic order
62	Numerical session
63	Numerical session

64	Domain and block wall energy
65	Occurrence of superconductivity
66	Meissner effect
67	Type -I and Type -II superconductors
68	Heat capacity
69	Energy gap, isotope effect
70	London equation, coherence length , postulates of BCS
71	Theory of superconductivity , BCS ground state, persistent current
72	High temperature oxide,super conductors introduction and discovery
73	Revision of unit -IV test
74	Numerical revision

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