RPS Degree College, Balana (Mahendergarh)

son Plan

2020-21(Odd Semester)

Class and Section: M.Sc. Physics 3rd Sem
Subject: Condensed Matter Physics (PHY-301)

Lecture	Topics
1	**Unit I: Introduction to Crystal Physics and Crystal Diffraction**
2	Crystalline solids, lattice, and the basis
3	lattice translation vectors
4	direct lattice
5	two-dimensional (2-D) Bravais lattice
6	three-dimensional (3-D) Bravais lattice
7	conventional units cells of FCC and BCC
8	conventional units cells of Nacl and CsCl
9	conventional units cells of Diamond and cubic ZnS
10	primitive lattice cell of FCC and BCC
11	primitive lattice cell of HCP and closed packed structures
12	packing fraction of simple cubic and bcc
13	packing fraction of fcc and diamond structures
14	packing fraction of HCP structure
15	***REVISION of all above covered topics***
16	Interaction of x-rays with matter
17	absorption of X-rays
18	Elastic scattering from a perfect lattice
19	Elastic scattering from a perfect lattice
20	Rreciprical lattice and its application to diffraction techniques
21	Ewald's construction
22	Laue method
23	Rotating crystal method
24	powder method
25	powder method
26	atomic form factor
27	crystal structure fractor and intensity of diffraction maxima
28	Crystal structure factors of simple cubic and bcc
29	crystal structure factor of fcc and monatomic diamond lattice
30	crystal structure factor of polyatomic CuZn.
31	***REVISION of all above covered topics***
32	**Unit II: Introduction to Lattice Vibration and Defects in Crystals**
33	Vibration of one dimensional mono-atonic-chain
34	__--continue--__
35	Vibration of one dimensional diotonic-chain

36	__--continue--__
37	__--continue--__
38	phonon momentum
39	density of normal modes in one dimension
40	density of normal modes in three dimensions
41	quantization of lattice vibrations
42	measurement of phonon dispersion using inelastic neutron scattering
43	__--continue--__
44	***REVISION of all above covered topics***
45	Point defects
46	line defects: Edge dislocations
47	line defects: Screw dislocations
48	planer (stacking) faults
49	__--continue--__
50	__--continue--__
51	Fundamental ideas of the role of dislocation in plastic deformation and crystal growth
52	__--continue--__
53	the observation of imperfection in crystals
54	X-rays technique
55	Electron microscopic technique
56	***REVISION of all above covered topics***
57	**Unit III: Introduction to Electronic Properties of Solids and Energy Bands**
58	Electron in periodic lattice
59	Bloch theorem
60	Kronig-Penny model
61	__--continue--__
62	band theory
63	classification of solids, Effective mass
64	weak-binding method and its application to linear lattice
65	__--continue--__
66	tight -binding method and its application to cubic bcc and fcc crystals
67	__--continue--__
68	__--continue--__
69	concepts of holes, Fermi surface
70	construction of Fermi surface in two-dimension
71	de-Hass van alfen effect
72	cyclotron resonance
73	magnetoresistance
74	**Unit IV: Introduction to Ferromagnetism, Anti-ferromagnetism**
75	Weiss Theory of Ferromagnetism
76	Heisenberg model
77	molecular field theory of ferromagnetism of spin waves and magnons
78	__--continue--__
79	Curie-weiss law for susceptibility

80	__--continue--__
81	Ferri and Anti Ferro-magnetic order
82	Domains and Block wall energy
83	__--continue--__
84	**Introduction to Superconductivity**
85	Occurrence of supercunductivity, Messner effect
86	Type-I and Type-II superconductors
87	Heat capacity, Energy gap, Isoptope effect
88	London equation
89	__--continue--__
90	Coherence length
91	Postulates of BCS theory of superconductivity
92	BCS ground state
93	Persistent current
94	High temperature oxide super conductors (introduction and discovery)
95	Discussion on Previous Year Questions: 2019
96	Discussion on Previous Year Questions: 2018
97	Discussion on Previous Year Questions: 2017
98	Discussion on Previous Year Questions: 2016
99	Discussion on Previous Year Questions: 2015

RPS Degree College, Balana (Mahendergarh)

Lesson Plan

2020-21(Odd Semester)

Class and Section: M.Sc. Physics 3rd Sem

Subject: Electrodynamics & Wave Propagation (PHY-302)

Name of the Faculty : Mr. Praveen Kumar

Lectures	Topics
1.	INTRODUCTION (CORDINATE SYSTEM)
2.	BASIC OF FOUR VECTOR
3.	LORENTZ TRANSFORMATION IN FOUR DIMENSIONAL SPACE
4.	LORENTZ TRANSFORMATION IN FOUR DIMENSIONAL SPACE
5.	CONSERVATION OF CHARGE AND FOUR CURRENT DENSITY
6.	CONSERVATION OF CHARGE AND FOUR CURRENT DENSITY
7.	ELECTROMAGNETIC FIELD TENSOR IN FOUR DIMENSIONS
8.	ELECTROMAGNETIC FIELD TENSOR IN FOUR DIMENSIONS
9.	LORENTZ INVARIANCE OF MAXWELL'S EQUESTIONS
10.	LORENTZ INVARIANCE OF MAXWELL'S EQUESTIONS
11.	DUAL FIELD TENSOR
12.	DUAL FIELD TENSOR
13.	TRANSFORMATION OF ELECTRIC AND MAGNETIC FIELDS
14.	TRANSFORMATION OF ELECTRIC AND MAGNETIC FIELDS
15.	TRANSFORMATION OF ELECTRIC AND MAGNETIC FIELDS
16.	COVARIANCE OF FORCE EQUATION
17.	BASICS OF RADIATING SYSTEMS
18.	BASICS OF RADIATING SYSTEMS
19.	FIELD AND RADIATION OF A LOCALIZED SOURCE AND OSCILLATING ELECTRIC DIPOLE
20.	FIELD AND RADIATION OF A LOCALIZED SOURCE AND OSCILLATING ELECTRIC DIPOLE
21.	CENTRE FED LINEAR ANTENNA AND LINEARD-WIECHERT POTENTIAL
22.	CENTRE FED LINEAR ANTENNA AND LINEARD-WIECHERT POTENTIAL
23.	ELECTRIC AND MAGNETIC FIELDS DUE TO A UNIFORMLY MOVING CHARGE AND ACCELERATED CHARGE
24.	ELECTRIC AND MAGNETIC FIELDS DUE TO A UNIFORMLY MOVING CHARGE AND ACCELERATED CHARGE
25.	LINEAR AND CIRULAR ACCELERATION AND ANGULAR DISTRUBUTION OF POWER
26.	LINEAR AND CIRULAR ACCELERATION AND ANGULAR DISTRUBUTION OF POWER
27.	RIVISION
28.	UNIT TEST
29.	BASIC OF RADIATIVE REACTION FORCE
30.	BASIC OF RADIATIVE REACTION FORCE
31.	THOMPSON AND RAYLEIGH SCATTERING, NORMAL AND ANOMALOUS DISPERSION

32.	THOMPSON AND RAYLEIGH SCATTERING, NORMAL AND ANOMALOUS DISPERSION
33.	IONOSPHERE AND PROPAGATION OF ELECTROMAGNETIC WAVE THROUGH IONOSPHERE
34.	IONOSPHERE AND PROPAGATION OF ELECTROMAGNETIC WAVE THROUGH IONOSPHERE
35.	IONOSPHERE AND PROPAGATION OF ELECTROMAGNETIC WAVE THROUGH IONOSPHERE
36.	REFLECTION OF ELECTROMAGNETIC WAVE BY IONOSPHERE
37.	MOTION OF CHARGE PARTICLE IN ELECTRIC AND MAGNETIC FIELDS
38.	MOTION OF CHARGE PARTICLE IN ELECTRIC AND MAGNETIC FIELDS
39.	MOTION OF CHARGE PARTICLE IN ELECTRIC AND MAGNETIC FIELDS
40.	Revision
41.	UNIT TEST
42.	PROBLEMS SOLUTION
43.	BASICS OF WAVE GUIDE AND TRANSMISSION LINES
44.	BASICS OF WAVE GUIDE AND TRANSMISSION LINES
45.	WAVE GUIDE MODES IN RECTANGULAR WAVE GUIDE
46.	WAVE GUIDE MODES IN RECTANGULAR WAVE GUIDE
47.	DIELECTRIC WAVE GUIDE AND ATTENUATION IN WAVE GUIDES
48.	DIELECTRIC WAVE GUIDE AND ATTENUATION IN WAVE GUIDES
49.	DIELECTRIC WAVE GUIDE AND ATTENUATION IN WAVE GUIDES
50.	CIRCUIT REPRESENTATION OF PARALLEL PLATE TRANSMISSION LINE AND TRANSMISSION LINE EQUATIONS AND THEIR SOLUTIONS
51.	CIRCUIT REPRESENTATION OF PARALLEL PLATE TRANSMISSION LINE AND TRANSMISSION LINE EQUATIONS AND THEIR SOLUTIONS
52.	CIRCUIT REPRESENTATION OF PARALLEL PLATE TRANSMISSION LINE AND TRANSMISSION LINE EQUATIONS AND THEIR SOLUTIONS
53.	CHARACTERISTIC INPEDANCE AND PROPAGATION COEFFIEIENT
54.	CHARACTERISTIC INPEDANCE AND PROPAGATION COEFFIEIENT
55.	LOW LOSS RADIO FREQUENCY AND UHF TRANSMISSION LINES
56.	LOW LOSS RADIO FREQUENCY AND UHF TRANSMISSION LINES
57.	REVESION
58.	REVESION
59.	UNIT TEST
60.	PROBLEMS SOLUTION
61.	BASICS OF WAVE GUIDE AND TRANSMISSION LINES
62.	WAVE GUIDE MODES IN RECTANGULAR WAVE GUIDE
63.	WAVE GUIDE MODES IN RECTANGULAR WAVE GUIDE
64.	DIELECTRIC WAVE GUIDE AND ATTENUATION IN WAVE GUIDES
65.	DIELECTRIC WAVE GUIDE AND ATTENUATION IN WAVE GUIDES
66.	Previous year papers
67.	Previous year papers

RPS Degree College, Balana (Mahendergarh)

Lesson Plan

2020-21(Odd Semester)

Class and Section: M.Sc. Physics 3rd Sem
Subject: Electronics-1(PHY-304)
Name of the Faculty : Mr. Naveen Kumar

Lecture	Topics
1	Introduction to Syllabus, Scheme of Exam & Learning Objectives/Outcomes
2	Test to Check the Learning Level of the Students
3	Introduction to number system
4	type of number system
5	conversertion of number system
6	conversertion of number system
7	conversertion of number system
8	addition,subtraction,multiplication and division of binary number
9	addition,subtraction,multiplication and division of octal number
10	addition,subtraction,multiplication and division of hexadecimal number
11	BCD and Gray code
12	1's and 2's compliment
13	Assignment and test of unit 1
14	Introduction to digital electronics
15	Logic gates (basic)
16	Universal logic gates
17	Exclusive logic gates
18	Boolean expression
19	Boolean algebra
20	Concept of K map
21	SOP
22	**POS**
23	**Minmum number of NAND and NOR Gate**
24	**Aignment and test of unit 2**
25	Introduction to digital electronics and type of circuits
26	combinational circuits, half adder and half subtractor
27	full adder and full subtractor
28	mux and demux
29	coder and decoder
30	parity cheaker and parity generator circuits
31	ROM
32	Digital comperator
33	Sequential circuits
34	Latch

35	SR latch
36	SR flip flop
37	JK flip flop
38	T flip flop
39	D flip flop
40	Registers
41	Registers
42	Counters
43	counters
44	Revision
45	Test and assignment of Unit 3
46	Introduction to MOSFET
47	n channel E MOSFET
48	p channel E MOSFET
49	n channel D MOSFET
50	p channel D MOSFET
51	PMOS and NMOS as inverter
52	CMOS as inverter
53	PMOS and NMOS as NAND and NOR
54	CMOS as NAND and NOR
55	Revision unit 4
56	Revision unit 3
57	Revision Unit 3
58	Revision unit 2
59	Revision unit 2
60	Revision unit 1
61	Revision unit 1
62	Previous year paper
63	Previous year paper
64	Previous year paper
65	Previous year paper
66	Full Length Revision
67	Full Length Test

RPS Degree College, Balana (Mahendergarh)

Lesson Plan

2020-21(Odd Semester)

Class and Section: M.Sc. Physics 3rd Sem

Subject: Atomic & Molecular Physics(PHY-306)

Name of the Faculty : Ms. Archana Sahoo

Lectures	Particular
1	Introduction to syllabus
2	Introduction to AMP
3	Atomic & Molecular Spectra
4	Hydrogen Spectra
5	Alkali Atom Spectra
6	Raman Effect
7	Classical Theory of Raman Effect
8	Quantum Theory of Raman Effect
9	molecular polarisability
10	pure rotational Raman spectra of diatomic molecules
11	vibration rotation Raman Spectrum of diatomic molecules.
12	vibration rotation Raman Spectrum of diatomic molecules.
13	Revision
14	Assignment 1
15	Intensity alternation in Raman spectra of diatomic molecules.
16	Intensity alternation in Raman spectra of diatomic molecules.
17	Class Test
18	Problems
19	Revision
20	Electronic spectra of diatomic molecules,
21	Born Oppenheimer approximation
22	Born Oppenheimer approximation
23	vibrational coarse structure of electronic bands
24	vibrational coarse structure of electronicbands
25	Revision
26	Sessional 1
27	Sessional Discussion
28	Problems
29	Revision

30	-progression and sequences,
31	-progression and sequences,
32	intensity of electronic bands
33	Frank Condon principle.
34	Frank Condon principle.
35	Frank Condon principle.
36	Frank Condon principle.
37	Frank Condon principle.
38	Revision
39	Test
40	Dissociation and pre-dissociation energy
41	Dissociation and pre-dissociation energy
42	Dissociation and pre-dissociation energy
43	Dissociation and pre-dissociation energy
44	Revision
45	Test
46	Problems
47	Assignment 2
48	Rotational fine structure of electronic bands.
49	Rotational fine structure of electronic bands.
50	Experimental set up for Raman spectroscopy -
51	Sessional 2
52	Sessional discussion
53	Problems
54	Revision
55	application of IR and Raman spectroscopy in the structure determination of simple molecules.
56	application of IR and Raman spectroscopy in the structure determination of simple molecules.
57	application of IR and Raman spectroscopy in the structure determination of simple molecules.
58	application of IR and Raman spectroscopy in the structure determination of simple molecules.
59	application of IR and Raman spectroscopy in the structure determination of simple molecules.
60	Class Test

61	Assignment 3
62	The origin of X-Rays,
63	X-Ray emission spectra,
64	Dependence of position of Emission lines on the atomic number,
65	Dependence of position of Emission lines on the atomic number,
66	X-Ray emission (Doublet) spectra,
67	X-Ray emission (Doublet) spectra,
68	X-Ray emission (Doublet) spectra,
69	Revision
70	Problems
71	Satellites,
72	Continuous X-ray Emission,
73	Continuous X-ray Emission,
74	X-Ray Absorption spectra.
75	X-Ray Absorption spectra.
76	Revision
77	Problems
78	Assignment 4
79	Previous Year Question paper solved