Govt. P. G. College Ambala Cantt.

Lesson Plan 2019-20 (Even Semester)

Name of Assistant Professor: Dr. Raj Kumari

Department : Physics

Class: B.Sc. 2nd Semester Non-Med (1-3) Days

Subject: Semi-Conductor Devices (PH-202)

Week	Topic
3.	**Unit I : Semiconductors** Energy bands in solids, Intrinsic and extrinsic semiconductors
4.	carrier mobility and electrical resistivity of semi-Conductor , Hall effect
5.	p-n junction diode and their characteristics Zener and Avalanche breakdown, Zener diode, Zener diode as a voltage regulator
6.	p-n junction as a rectifier, half wave and full wave rectifiers (with derivation) filters (series inductor, shunt capacitance, L-section or choke, π and R.C. filter circuits **Doubts/Querries**
7.	**Test I/ Assignment I** **Unit: II Transistors:** Junction transistors Working of NPN and PNP transistors
8.	Three configurations of transistor (C-B, C-E, C-C modes) Common base, common emitter characteristics of transistor common collector characteristics of transistor
9.	Constants of a transistor and their relation Advantages and disadvantages of C-E configuration D.C. load line
10.	***Mid Semester Vacations***
11.	Transistor biasing, various methods of transistor biasing and stabilization **Doubts/Querries** **Test II/ Assignment II** **Unit III: Transistor Amplifiers:** Amplifiers, Classification of amplifiers,
12.	common base and common emitter amplifiers coupling of amplifiers

13.	various methods of coupling Resistance- Capacitance (RC) coupled amplifier (two stage, concept of band width, no derivation) **Doubts/Querries**
14.	**Unit IV : Oscillators**: Principle of oscillation, classification of oscillators, classification of oscillators,.......cont...
15.	Condition for self sustained oscillation: Barkhausen criterion for oscillation,
16.	Tuned collector common emitter oscillator, Hartley oscillator, C.R.O. (Principle and Working).
17.	**Doubts/Querries** **Test IV/ Assignment IV**

Govt. P. G. College Ambala Cantt.

Lesson Plan 2019-20 (Even Semester)

Name of Assistant Professor: Dr. Raj Kumari

Department : Physics

Class: B.Sc. 6th Semester Non-Med (1-3) Days

Subject: Atomic and Molecular Spectroscopy (PH-602)

Week	Topic
3.	**Unit – I: Historical background of atomic spectroscopy** Introduction of early observations, emission and absorption spectra
4.	atomic spectra, wave number spectrum of Hydrogen atom in Balmer series Bohr atomic model (Bohr's postulates)
5.	spectra of Hydrogen atom, explanation of spectral series in Hydrogen atom un-quantized states and continuous spectra spectral series in absorption spectra, effect of nuclear motion on line spectra (correction of finite nuclear mass)
6.	variation in Rydberg constant due to finite mass, short comings of Bohr's theory Wilson sommerfeld quantization rule, de-Broglie interpretation of Bohr quantization law Bohr's corresponding principle, Sommerfeld's extension of Bohr's model
7.	Sommerfeld relativistic correction, Short comings of Bohr-Sommerfeld theory Vector atom model; space quantization, electron spin, coupling of orbital and spin angular momentum, spectroscopic terms and their notation quantum numbers associated with vector atom model, transition probability and selection rules
8.	**Doubts/Querries** **Test I/ Assignment I** **Unit –II: Vector Atom Model (single valance electron)** Orbital magnetic dipole moment (Bohr megnaton)
9.	behavior of magnetic dipole in external magnetic filed; Larmors' precession and theorem Penetrating and Non-penetrating orbits, Penetrating orbits on the classical model Quantum defect, spin orbit interaction energy of the single valance electron, spin orbit interaction for penetrating and non-penetrating orbit

10.	**Mid-Semester Vacations**
11.	**Doubts/Querries** quantum mechanical relativity correction Hydrogen fine spectra, Main features of Alkali Spectra
12.	Rydeburg-Ritze combination principle, Absorption spectra of Alkali atoms observed doublet fine structure in the spectra of alkali metals and its Interpretation
13.	Intensity rules for doublets, comparison of Alkali spectra and Hydrogen spectrum **Test II/ Assignment II**
14.	**UNIT-III: Vector Atom model (two valance electrons)** Essential features of spectra of Alkaline-earth elements Vector model for two valance electron atom: application of spectra Coupling Schemes;LS or Russell – Saunders Coupling Scheme and JJ coupling scheme **Test III/ Assignment III**
15.	Two valance electron system-spectral terms of non-equivalent and equivalent electrons, comparison of spectral terms in L-S And J-J coupling Hyperfine structure of spectral lines and its origin; isotope effect, nuclear spin **Doubts/Querries**
16.	**Unit –IV: Atom in External Field** Zeeman Effect (normal and Anomalous), Experimental set-up for studying Zeeman effect, Explanation of normal Zeeman effect (classical and quantum mechanical)
17.	Paschen-Back effect of a single valence electron system. Weak field Stark effect of Hydrogen atom, Raman Spectra **Doubts/Querries** **Test IV/ Assignment IV**

Govt. P. G. College Ambala Cantt.

Lesson Plan 2019-20 (Even Semester)

Name of Assistant Professor: Dr. Raj Kumari

Department : Physics

Class: B.Sc. 6th Semester Computer Science (4-6) Days

Subject: Atomic and Molecular Spectroscopy (PH-602)

Week	Topic
3.	**Unit – I: Historical background of atomic spectroscopy** Introduction of early observations, emission and absorption spectra
4.	atomic spectra, wave number spectrum of Hydrogen atom in Balmer series Bohr atomic model (Bohr's postulates)
5.	spectra of Hydrogen atom, explanation of spectral series in Hydrogen atom un-quantized states and continuous spectra spectral series in absorption spectra, effect of nuclear motion on line spectra (correction of finite nuclear mass)
6.	variation in Rydberg constant due to finite mass, short comings of Bohr's theory Wilson Sommerfeld quantization rule, de-Broglie interpretation of Bohr quantization law Bohr's corresponding principle, Sommerfeld's extension of Bohr's model
7.	Sommerfeld relativistic correction, Short comings of Bohr-Sommerfeld theory Vector atom model; space quantization, electron spin, coupling of orbital and spin angular momentum, spectroscopic terms and their notation quantum numbers associated with vector atom model, transition probability and selection rules
8.	**Doubts/Querries** **Test I/ Assignment I** **Unit –II: Vector Atom Model (single valance electron)** Orbital magnetic dipole moment (Bohr megnaton)

9.	behavior of magnetic dipole in external magnetic filed; Larmors' precession and theorem Penetrating and Non-penetrating orbits, Penetrating orbits on the classical model Quantum defect, spin orbit interaction energy of the single valance electron, spin orbit interaction for penetrating and non-penetrating orbit
10.	**Doubts/Querries** quantum mechanical relativity correction Hydrogen fine spectra, Main features of Alkali Spectra
11.	**Mid-Semester Vacations**
12.	Rydeburg-Ritze combination principle, Absorption spectra of Alkali atoms observed doublet fine structure in the spectra of alkali metals and its Interpretation
13.	Intensity rules for doublets, comparison of Alkali spectra and Hydrogen spectrum **Test II/ Assignment II**
14.	**UNIT-III: Vector Atom model (two valance electrons)** Essential features of spectra of Alkaline-earth elements Vector model for two valance electron atom: application of spectra Coupling Schemes;LS or Russell – Saunders Coupling Scheme and JJ coupling scheme **Test III/ Assignment III**
15.	Two valance electron system-spectral terms of non-equivalent and equivalent electrons, comparison of spectral terms in L-S And J-J coupling Hyperfine structure of spectral lines and its origin; isotope effect, nuclear spin **Doubts/Querries**
16.	**Unit –IV: Atom in External Field** Zeeman Effect (normal and Anomalous), Experimental set-up for studying Zeeman effect, Explanation of normal Zeeman effect (classical and quantum mechanical)
17.	Paschen-Back effect of a single valence electron system. Weak field Stark effect of Hydrogen atom, Raman Spectra **Doubts/Querries** **Test IV/ Assignment IV**