

## Lesson Plan of January to April

Name of the Assistant/ Associate Professor: Ms. Divya

Session – 2023-24

Class: B.Sc. 1<sup>st</sup> Year

Semester: 2<sup>nd</sup>

Subject: Paper II- PHY 202: Electro-magnetic Induction and Electronic Devices

Month	Topic
JANUARY	<p>Unit I Electromagnetic Induction : Growth and decay of current in a circuit with (a) Capacitance and resistance (b) resistance and inductance (c) Capacitance and inductance (d) Capacitance resistance and inductance. AC circuit analysis using complex variables with (a) capacitance and resistance, (b) resistance and inductance (c) capacitance and inductance (d) capacitance, inductance and resistance Series and parallel resonant circuit. Quality factor (Sharpness of resonance) <b>Presentation Revision and Test</b></p>
FEBRUARY	<p>Unit II Semiconductor Diodes : Energy bands in solids. Intrinsic and extrinsic semiconductor, Hall effect, P-N junction diode and their V-I characteristics. Zener and avalanche breakdown. Resistance of a diode, Light Emitting diodes (LED). Photo conduction in semiconductors, photodiode, Solar Cell. Diode Rectifiers : P-N junction half wave and full wave rectifier. Types of filter circuits (L and - with theory). Zener diode as voltage regulator, simple regulated power supply. <b>Presentation Revision and Test</b></p>
MARCH	<p>Remaining part of Unit II Transistors: Junction Transistors, Bipolar transistors, working of NPN and PNP transistors, Transistor connections (C-B, C-E, C-C mode), constants of transistor. Transistor characteristic curves (excluding h parameter analysis), advantage of C-B configuration. C.R.O. (Principle, construction and working in detail)</p> <p>Unit III Transistor Amplifiers : Transistor biasing, methods of Transistor biasing and stabilization. D.C. load line. Common-base and common-emitter transistor biasing. Common-base, common emitter amplifiers <b>Presentation Revision and Test</b></p>
APRIL	<p>Remaining part of Unit III Classification of amplifiers. Resistance-capacitance (R-C) coupled amplifier (two stage; concept of band width, no derivation). Feed-back in amplifiers, advantage of negative feedback Emitter follower. Oscillators : Oscillators, Principle of Oscillation, Classification of Oscillator. Condition for self sustained oscillation : Barkhausen Criterion for oscillations. Tuned collector common emitter oscillator. Hartley oscillator. Colpitt's oscillator. <b>Presentation Revision and Test</b></p>

## Lesson Plan of January to April

Name of the Assistant/ Associate Professor: Ms. Divya

Session – 2023-24

Class: B.Sc. 2<sup>nd</sup> Year

Semester: 4<sup>th</sup>

Subject: Paper II- PHY 402: Optics – II

Month	Topic
JANUARY	<p>Unit-I Interference by Division of Amplitude :Colour of thin, films, wedge shaped film, Newton's rings. Interferometers: Michelson's interferometer and its application to (I) Standardisation of a meter (II) determination of wave length.</p> <p><b>Presentation Revision and Test</b></p>
FEBRUARY	<p>Remaining part of Unit I Fresnel's Diffraction : Fresnel's half period zones, zone plate, diffraction at a straight edge, rectangular slit and circular aperture.</p> <p>Unit-II Fraunhofer diffraction : One slit diffraction, Two slit diffraction N-slit diffraction, Plane transmission grating spectrum, Dispersive power of a grating.</p> <p><b>Presentation Revision and Test</b></p>
MARCH	<p>Remaining part of Unit II Limit of resolution, Rayleigh's criterion, resolving power of telescope and a grating.</p> <p>Unit III Polarization :Polarisation and Double Refraction : Polarisation by reflection, Polarisation by scattering, Malus law, Phenomenon of double refraction, Huygen's wave theory of double refraction (Normal and oblique incidence).</p> <p><b>Presentation Revision and Test</b></p>
APRIL	<p>Remaining part of Unit III Analysis of Polarised light : Nicol prism, Quarter wave plate and half wave plate, production and detection of (i) Plane polarized light (ii) Circularly polarized light and (iii) Elliptically polarized light, Optical activity, Fresnel's theory of rotation, Specific rotation, Polarimeters (half shade and Biquartz).</p> <p><b>Presentation Revision and Test</b></p>

## Lesson Plan of January to April

Name of the Assistant/ Associate Professor: Ms. Divya

Session – 2023-24

Class: B.Sc. 3<sup>rd</sup> Year

Semester: 6<sup>th</sup>

Subject: Paper I- PHY 601: ATOMIC MOLECULAR AND LASER PHYSICS

Month	Topic
JANUARY	Unit -I Vector atom model, quantum numbers associated with vector atom model, penetrating and non penetrating orbits (qualitative description ), spectral lines in different series of alkali spectra, spin orbit interaction and doublet term separation <b>Presentation Revision and Test</b>
FEBRUARY	Remaining part of Unit I LS or Russell -Saunders Coupling jj coupling (expressions for interaction energies for LS and jj coupling required). Unit-II Zeeman effect (normal and Anomalous) Zeeman pattern of D 1 and D2 lines of Na-atom, Paschen, Back effect of a single valence electron system. Weak field Stark effect of Hydrogen atom. <b>Presentation Revision and Test</b>
MARCH	Remaining part of Unit II Discrete set of electronic energies of molecules. quantization of Vibrational and rotational energies Raman effect (Quantitative description) Stoke's and anti Stoke's lines. Unit III Main features of a laser : Directionality, high intensity, high degree of coherence, spatial and temporal coherence, <b>Presentation Revision and Test</b>
APRIL	Remaining part of Unit III Einstein's coefficients and possibility of amplification, momentum transfer, life time of a level, kinetics of optical absorption. Threshold condition for laser emission, Laser pumping, He-Ne laser and RUBY laser (Principle, Construction and Working). Applications of laser in the field of medicine and industry. <b>Presentation Revision and Test</b>

## Lesson Plan of January to April

Name of the Assistant/ Associate Professor: Ms. Divya

Session – 2023-24

Class: M.Sc. 1<sup>st</sup> Year

Semester: 2<sup>nd</sup>

Subject: Paper IX: Atomic and Molecular Physics 22PHY22C3

Month	Topic
JANUARY	Unit I One Electron systems and Pauli principle: Quantum states of one electron atoms, atomic orbitals, Hydrogen spectrum, Pauli principle, spectra of alkali elements, spin orbit interaction and fine structure in alkali spectra, Spectra of two electron systems, equivalent and nonequivalent electrons <b>Presentation Revision and Test</b>
FEBRUARY	Unit II The influence of external fields, Two electron system Hyperfine structure and Line broadening: Normal and anomalous Zeeman effect, Paschen Back effect, Stark effect, Two electron systems, interaction energy in LS and JJ coupling, Hyperfine structure (magnetic and electric, only qualitative) <b>Presentation Revision and Test</b>
MARCH	Unit III Diatomic molecules and their rotational spectra: Types of molecules, Diatomic linear symmetric top, asymmetric top and spherical top molecules, Rotational spectra of diatomic molecules as a rigid rotator, energy levels and spectra of non-rigid rotor, intensity of rotational lines. <b>Presentation Revision and Test</b>
APRIL	Unit IV Vibrational and Rotational Vibration spectra of Diatomic molecules: Vibrational energy of diatomic molecule, Diatomic molecules as a simple harmonic oscillator, Energy levels and spectrum, Morse potential energy curve, Molecules as vibrating rotator, vibration spectrum of diatomic molecules, PQR Branches <b>Presentation Revision and Test</b>

