Government College For Girls, Unhani

Department Of PHYSICS - Session : 2023-2024

Name Of The Assistant Professor : Dinesh KUMAR

Class : B.Sc. 1st- Semester II

Lesson Plan

Week 01
Elasticity, Stress, Strain, Hook's Law, Elastic Constants & Their Relation, Poisson's Ratio , Torsion OF Cylinder, Twisting Couple, Coeff. Of Modulus of Rigidity

Week 02
Bending of Beam, Cantilever & Centrally Loaded Beam, Youngs Modulus for Material of Beam

Week 03
Assumption of Kinetic Theory of gases, Pressure for ideal gas, Kinetic interpretation of temp, Degree of Freedom, Law of equipartition of energy, Specific heat of gases

Week 04
Real Gases, Vander wall's Equation, Brownian motion, Maxwell distribution of speed, Maxwell distribution of velocity

Week 05
Most Probable Speed, Average Speed, R.M.S Speed, Transport Phenomena, Transport of Energy, Transport of Momentum

Week 06
Diffusion of Gases, Theory of relativity introduction, Reference systems, inertial frames, Gallilean invariance and Conservation laws, Newtonian relativity principle

Week 07
Michelson - Morley experiment, Search for ether. Lorentz transformations, Search for ether. Lorentz transformations, length contraction, time dilation, Velocity addition theorem, variation of mass with velocity, mass energy equivalence

Week 08
Growth and decay of current in a circuit with (a) Capacitance (b) resistance and inductance(c) Capacitance and inductance (d) Capacitance resistance and inductance. AC circuit analysis using complex variables variables with (a) capacitance and resistance (b) resistance and inductance, (c) capacitance and inductance

Week 09
(d) capacitance, inductance and resistance Series, and parallel resonantcircuit, Quality factor (Sharpness of resonance), Energy bands in solids, Intrinsic and extrinsic semiconductor, Hal l effect and PN junction diode, Zener and avalanche breakdown

Week 10
Light Emitting diodes (LED), Solar Cell, Discussion on Diode Rectifiers, P-N junction half wave, full wave rectifier, Types of filter circuit' Zener diode as voltage regulator

Week 11
Junction Transistor, working of NPN,PNP, Transistor connection C-B,C-E,C-C, Transistor characteristic curve, C.R. O.

Week 12
Discussion on transistor amplifier, methods of Transistor biasing stabilization. D.C load line, Common-base common emitter transistor biasing, C-B amplifier, c-e amplifier, Classification of amplifier, Resistance-capacitance (R-C) coupled amplifier

Week 13
feed-back in amplifier, Principle of Oscillator, Classification of Oscillator, Tuned collector common emitter oscillator, Hartley oscillator, Colpitt's oscillator

Week 14
Revision

H.O.D.
Physics

Government College For Girls, Unhani

Department Of PHYSICS - Session : 2023-2024

Name Of The Assistant Professor : Dinesh KUMAR

Class : B.Sc.2ND - Semester IV

Lesson Plan

Week 01
Probability, some probability considerations, combinations possessing maximum probability, Distribution of molecules in two boxes, Case with weightage (general), distribution of molecules in two boxes

Week 02
Phase space, Microstates, macrostates, statistical fluctuations constraints, accessible States, Thermodynamically probability, Postulates of Statistical Physics, Division of Phase space into cells

Week 03
Condition of equilibrium between two system in thermal contact ,b-Parameter, Entropy and Probability, Boltzman's distribution law, Evaluation of A and b, Bose-Einstein statistics

Week 04
Application of B.E. Statistics to Plancks's radiation law, B.E. gas, Basics Fermi-Dirac statistics, Fermi-Dirac statistics, M.B, Law

Week 05
Basics Fermi-Dirac statistics, Fermi-Dirac statistics, B.E. Degeneracy, M.B. Law as limiting case of B.E. Degeneracy

Week 06
Condensation, F.D. Gas, electron gas in metals, Zero point energy, Specific heat of metals and its solution

Week 07
. Introduction to Optics, Interference by Division of Amplitude :Colour of thin films, wedge shaped film, Newton's rings, Interferometers: Michelson's interferometer

Week 08
application
(I) Standardization of a meter, (II) determination of wave length,
Fresnel's Diffraction, Fresnel's half period zones, zone plate, diffraction at a straight edge, diffraction at a rectangular slit, diffraction at a circular aperture

Week 09
Frainhoffer diffraction, One slit diffraction, Two slit diffraction, N-slit diffraction, Frainhoffer diffraction, Plane transmission granting spectrum

Week 10
Dispersive power of a grating, resolving power of telescope and a grating, Polarization

Week 11
Polarization , Double Refraction, Huygen's wave theory of double refraction, Analysis of Palorised light : Nicol prism, Quarter wave plate, half wave plate, production and detection of polarized light

Week 12
Optical activity, Fresnel's theory of rotation, Specific rotation, Polarimeters

Week 13
Revision

H.O.D.
Physics

Government College For Girls, Unhani

Department Of PHYSICS - Session : 2023-2024

Name Of The Assistant Professor : Dinesh KUMAR

Class : B.Sc.3RD - Semester VI

Lesson Plan

Week 01
Vector atom model, quantum numbers associated with vector atom model, penetrating and non penetrating orbits, spectral lines in different series of alkali spectra

Week 02
spin orbit interaction, doublet term separation LS, jj coupling, Zeeman effect

Week 03
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, Discrete set of electronic energies of molecules

Week 04
quantisation of Vibrational and rotational energies Raman effect, Stoke's and anti Stoke's lines, Main features of a laser

Week 05
Einstein's coefficients and possibility of amplification, He-Ne laser, RUBY laser, Applications of laser in the field of medicine and industry

Week 06
NUCLEAR PHYSICS - Nuclear mass and binding energy systematic nuclear binding energy, nuclear stability Nuclear, size, spin, parity, statistics magnetic dipole moment, quadrupole moment, Determination of mass by Bain-Bridge, Bain-Bride and Jordan mass spectrograph

Week 07
Determination of charge by Mosley law, Determination of size of nuclei by Rutherford Back Scattering
UNIT II Interaction of heavy charged particles (Alpha particles) alpha disintegration and its theory

Week 08
Energy loss of heavy charged particle, Energetic of alpha-decay, Range and straggling of alpha particles, Geiger-Nuttal law, Introduction of light charged particle (Beta-particle), Origin of continuous beta-spectrum (neutrino hypothesis), types of beta decay and energetics of beta decay, Energy loss of beta particles

Week 09
Range of electrons, absorption of beta-particles, Interaction of Gamma Ray, Nature of gamma rays, Energetics of gamma rays, passage of Gamma radiations through matter-photoelectric, compton and pair production effect

Week 10
electron position annihilation, Absorption of Gamma rays (Mass attenuation coefficient) and its application
UNIT III Nuclear reactions, Elastic scattering, Inelastic scatting, Nuclear disintegration, photonuclear reaction, Radiative capture, Direct reaction, heavy ion reactions and spallation Reactions

Week 11
conservation laws. Q-value and reaction threshold, Nuclear Reactors General aspects of Reactor design, Nuclear fission and fusion reactors, Linear accelerator, Tendem accelerator, Cyclotron and Betatron accelerators

Week 12
Ionization chamber, proportional counter, G.M. counter detailed study
scintillation counter , semiconductor detector.

Week 13
Revision

H.O.D.
Physics