GOVT COLLEGE SAFIDON   SESSION 2024-25

. 1st MDC Physics

LESSON PLAN

Paper MDC

Teacher: Ajay Parkash

MONTH	TOPICS
July	Physics: Nature, scope and excitement, Major discoveries in Physics, Major contribution by Indian Physicists, Physics in relation to other sciences,
	Impact of Physics on society, latest developments in Science and Technology,
Aug	System of measuring: Units, need for measurement, measuring process,
	concept of mass, length and time. Fundamental and derived units
	System of units, and concept of errors types of error(only definion)..
	Accuracy and precision in measurement
Sep	Least count and applications of measuring instruments
	Vernier Calliper, Screw guage.
	Motion of objects in one dimension: position of the object, origin/reference point, frame of reference
Oct	Definion and examples of motion in one , wo and three dimension.
	Scalar and vector quantities , description of motion along a straight line.
	Distance and displacement, uniform and non uniform motion
	, average and instantaneous speed,
Nov	average and instantaneous velocity, acceleration , graphical analysis of straight line motion,
	Distance-time graph, velocity-time graph
	, equations of motion and their applications

GOVT COLLEGE SAFIDON   SESSION 2024-25

B.Sc. 5th Sem Physics

Paper Nuclear Physics

LESSON PLAN

Teacher: Ajay Parkash

MONTH	TOPICS
July	Nuclear Composition(p-e and p-n hypothesis), Nuclear properties, Nuclear Size, sign, parity, statistics,
	Magnetic dipole moment, quadruple moment,(shape concept), Determination of mass by Brain-Bridge, Bain-Bridge and Jordan mass spectrograph,
Aug	Determination of charges by Moseley law, Determination of size of nuclei by Rutherford back Scattering, Mass and binding energy, systematic of nuclear-binding energy, nuclear stability
	Alpha-disintegration and its theory, Energetic of alpha-decay, origin of continuous spectrum(neutrino hypothesis), types of beta-decay and energetics of beta decay,
	Nature of gamma rays, Energetics of gamma rays. Interaction of heaby charged particles (Alpha Particles), Energy loss of heavy charged particle(idea of Bethe formulae, no derivation)
	Energy loss of heavy charged particle(idea of Bethe formulae, no derivation)
Sep	Range and straggling of alpha particles. Geiger-Nuttal law, Interaction of light charged particle (Beta particle),
	Energy loss of beta particles(ionization), Range of electron, absorption of beta particles
	Interaction of Gamma Ray; Passage of Gamma radiation through matter Photoelectric, Compton and pair production effect), electron-positron annihilation.
	Absorption of Gamma rays (Mass attenuation coefficient) and its applications.
Oct	Linear Accelerator, Tendem accelerator, Cyclotron and Betatron accelerators.
	Gas filled counters, ionization chamber, proportional counter, GM Counter(detailed study)
	Scintillation counter and semiconductor detector
	Nuclear Reactions, Elastic scattering, Inelastic scattering, Nuclear disintegration.
Nov	Photonuclear reaction, Radiative capture, Direct Reaction, Heavy ion reactions and spallation reactions, Conservation laws, Q-values and reaction threshold.
	Nuclear Reactors, General aspects of Reactor Design, Nuclear fission and fusion reactors (Principle, construction, working and use)
	DOUBT, EXAM PATTERN PAPER ,

GOVT COLLEGE SAFIDON   SESSION 2024-25

B.Sc. 3rd Sem Physics   LESSON PLAN

Paper TD and Statistical Physics   Teacher: Ajay Parkash

MONTH	TOPICS
July	Thermodynamics-system, variables and equations of state, thermal equilibrium, zeroth law of thermodynamics
	Concept of heat, work and its path dependence, (work done by the system, on the system),laws of thermodynamics, its significance and limitations,
Aug	Internal energy as a state function, , different types of process- isochoric process, adiabatic process, isothermal process, cyclic process
	Reversible and irreversible process, first law and second law of thermodynamics and its significance, carnot theorem and absolute scale of temperature, , Absolute zero and magnitude of each division on thermodynamics scale and perfect gas scale,
	Joule's free expansion, Joule's thomson's effect' Joule-Thomson) Porus plug experiment, conclusions and explanations,, Analytical treatment of Joule-Thomson effect, Entropy, calculation of entropy of reversible and irreversible process, diagram,
	Entropy of a perfect gas, Nernest Heat law(third law of thermodynamics, liquefaction of gases(oxygen, air, hydrogen and helium) solidification below 4K, Cooling by adiabatic demagnetization.
Sep	Introduction of Classius-clapeyron and claussius latent heat equations and significance, specific heat of saturated vapours, phase diagram and triple point of substance, development of Maxwell thermo dynamical equations,
	Thermodynamical functions: Internal Energy, Helmholtz function, Enthalpy, Gibb's function(G) and the relation between derivation of Maxwell thermodynamical relations from thermodynamical functions. Application of Maxwell relations:
	Relations between two specific heats of gas, Derivations of Classius-Clapeyron equation, variation of intrinsic energy with volume for
	(1) Perfect and Vander-wall gas (ii) solids and liquids, derivation of Stefan's law, Adiabatic compression and expansion of gas and deduction of theory of Thomson effect.
Oct	Distribution of N(for N=2,3,4) distinguishable and indistinguishable particles in two boxes of equal size, microstates and macrostates, thermodynamical probability, constraints and accessible states, statistical fluctuations,
	General distribution of distinguishable particles in compartments of different sizes, B-parameter, entropy and probability, concept of phase space, division of phase space into cells, postulates of statistical mechanics, classical and quantum statistics.
	Basis approach to three statistics, Maxwell-Boltzmann statistics applied to an ideal gas in equilibrium energy distribution law, Maxwell's distribution of speed and velocity (derivations required)
	Most probable speed, average and r.m.s. speed, mean energy for Maxwellian distribution. Dulong and Petit's law derivation ofDulong and Petit's law from Classical Physics,
Nov	Need of quantum statistics, Classical versus quantum statistics, Bose-Einstein energy distribution law,
	Application of B.E. statistics to Planck's radiation law, degeneracy and B.E. condensation, Fermi-Dirac-energy distribution law,
	F.D. gas and degeneracy, Fermienergy and Fermi temperature, FD energy distribution law for electron gas in metals, zero point energy, average speed (at OK) of electron gas.

GOVT COLLEGE SAFIDON   SESSION 2024-25

SEC   3rd SEM   LESSON PLAN

Paper BASIC INSTRUMENTATION SKILL   Teacher: Ajay Parkash

MONTH	TOPICS
July	Instruments accuracy, precision, sensitivity, resolution range, etc. Errors in measurement and loading effects, multimeter, principles of measurement of DC voltage and dc durrent, ac voltage , ac current and resistance
	Specifications of a multimeter and their significance. Advantage over conventional multimeter for voltage measurement with respect to input impedence and sensitivity,
Aug	Principle of voltage measurement (Block Diagram) Specification of an electronic voltmeter and their significance AC millivoltmeter, Types of AC millivoltmeter .
	Block diagram of ac millivoltmeter, specifications and their significance.
	Oscilloscope: Block diagram of basic CRO, CRT, measurement of voltage (Dc and ac)
	And frequency and time period using CRO. Special features of dual trace, introduction to digital oscilloscope, probe
Sep	Digital storage Oscilloscope : Principle of working.
	DC power sources, AC/DC generators, inductance, capacitance and impedance
	Operation of transformer, Electric motor, Single phase, three phase & DC Motor.
	Basic Design, Interfacing DC or AC sources to control heaters and motors.
Oct	Speed and power of ac motor.
	Comparison of analog and digital instruments, characteristics of digital meter
	Working principle of digital voltmeter,
	Digital Multimeter: Block Diagram and working of a digital multimeter,
Nov	Working principle of time interval, frequency and period measurement sing universal counter/frequency counter
	Time-base stability, accuracy and resolution.