Anjuman Islam Janjira Degree College of Science, Murud Janjira

Academic Calender 2022-2023

F.Y.B.Sc. Physics Sem - I Paper - I

Unit:I

Date	Topic
13-07-2022	Syllabus Discussion, Newton's first, second and third laws of motion
18-07-2022	interpretation and applications, pseudo forces, Inertial and non-inertial frames of reference.Worked out examples
19-07-2022	**Elasticity:** Review of Elastic constants Y, K, η and σ;Equivalence of shear strain to compression and extension strains
20-07-2022	Relations between elastic constants, Couple for twist in cylinder.
25-07-2022	**Fluid Dynamics:** Equation of continuity, Bernoulli's equation
26-07-2022	applications of Bernoulli's equation, streamline and turbulent flow
27-07-2022	lines of flow in airfoil, Poiseuille's equation

Unit:II

Date	Topic
01-08-2022	Lens Maker's Formula (Review), Newton's lens equation
02-08-2022	magnification-lateral, longitudinal and angular
03-08-2022	Equivalent focal length of two thin lenses, thick lens
08-08-2022	cardinal points of thick lens, Ramsdenand Huygens eyepiece
10-08-2022	cardinal points of thick lens, Ramsdenand Huygens eyepiece
17-08-2022	Aberration: Spherical Aberration, Reduction of Spherical Aberration
22-08-2022	Chromatic aberration and condition for achromatic aberration
23-08-2022	Interference: Interference in thin films, Fringes in Wedge shaped films
24-08-2022	Newton's Rings

UNIT III

Date	Topic
29-08-2022	Behavior of real gases and real gas equation
30-08-2022	Van der Waal equation
05-09-2022	Van der Waal equation
06-09-2022	Thermodynamic Systems
07-09-2022	Zeroth law of thermodynamics, Concept of Heat
12-09-2022	The first law, Non Adiabatic process and Heat as a path function,
13-09-2022	Internal energy, , Heat Capacity and specific heat
14-09-2022	Applications of first law to simple processes
19-09-2022	general relations from the first law
20-09-2022	Indicator diagrams, Work done during isothermal and adiabatic processes
21-09-2022	Work done during isothermal and adiabatic processes
26-09-2022	Worked examples, Problems
27-09-2022	Revision
28-09-2022	Revision

F.Y.B.Sc. Physics Sem - I Paper - II

Unit:I

Date	Topic
14-07-2022	**Structure of Nuclei**:Basic properties of nuclei, Composition, Charge, Size
16-07-2022	Rutherford's expt. for estimation of nuclear size, density of nucleus
16-07-2022	Mass defect and Binding energy
21-07-2022	Packing fraction, BE/A vs A plot, stability of nuclei (N Vs Z plot) and problems

23-07-2022	**Radioactivity**: Radioactive disintegration concept of natural and artificial radioactivity
23-07-2022	Properties of α, β, γ-rays, laws of radioactive decay
28-07-2022	half-life, mean life (derivation not required), units of radioactivity
30-07-2022	successive disintegration and equilibriums, radioisotopes. Numerical Problems
30-07-2022	Carbon dating and other applications of radioactive isotopes
04-08-2022	Carbon dating and other applications of radioactive isotopes

Unit:II

Date	Topic
06-08-2022	Interaction between particles and matter
06-08-2022	onization chamber, Proportional counter and GM counter
11-08-2022	Proportional counter and GM counter, problems
13-08-2022	Nuclear Reactions: Types of Reactions and Conservation Laws
13-08-2022	Concept of Compound and Direct Reaction
18-08-2022	Q value equation and solution of the Q equation, problems
20-08-2022	Fusion and fission definitions and qualitative discussion with examples.
20-08-2022	Fusion and fission definitions and qualitative discussion with examples.
25-08-2022	problems

Unit:III

Date	Topic
27-08-2022	Origin of Quantum theory, Black body
27-08-2022	Black Body spectrum, Wien's displacement law
08-09-2022	Matter waves, wave particle duality
10-09-2022	Heisenberg’s uncertainty Principle
10-09-2022	Davisson-Germer experiment
15-09-2022	G. P. Thompson experiment
17-09-2022	X-Rays production and properties
17-09-2022	Continuous and characteristic X-Ray spectra
22-09-2022	X-Ray Diffraction, Bragg’s Law, Applications of X-Rays
24-09-2022	Compton Effect, Pair production
24-09-2022	Photons and Gravity, Gravitational Red Shift
29-09-2022	Revision

S.Y.B.Sc. Physics Sem- III Paper - I Mechanics and thermodynamics

Date	Topic
14-06-2022	Syllabus Discussion
15-06-2022	Introduction to Analytical Chemistry and Statistical Treatment
	of analytical data-I
	Role of Analytical Chemistry
16-06-2022	Purpose of Chemical Analysis
21-06-2022	Analysis Based (i) On the nature of information required: (Proximate, Partial, Trace, Complete Analysis)
22-06-2022	(ii) On the size of the sample used (Macro, semi-micro and micro analysis)
23-06-2022	Classical and Non-Classical Methods of Analysis; their types and importance
28-06-2022	Terms involved in Sampling
	Types of Sampling
29-06-2022	Sampling techniques
30-06-2022	Errors in Analysis and their types
05-07-2022	Precision and Accuracy in Analysis
06-07-2022	Corrections for Determinate Errors

07-07-2022	Classical Methods of Analysis:
	Titrimetric Methods:
	Terms involved in Titrimetric methods of analysis. Comparing volumetry and Titrimetry
12-07-2022	The Conditions suitable for titrimetry
13-07-2022	Types of titrimetry – Neutralisation (Acidimetry, alkalimetry)
14-07-2022	Redox,(Iodometry, Iodimetry,)
19-07-2022	Precipitation and Complexometric titrations and indicators used in these titrations.
20-072022	Tools of Titrimetry: Graduated glasswares and Callibration
21-07-2022	Standard solutions (Primary and Secondary standards in Titrimetry) and Calculations in Titrimetry.
26-07-2022	Standard solutions (Primary and Secondary standards in Titrimetry) and Calculations in Titrimetry.
27-07-2022	Neutralisation Titrations:
	Concept of pH and its importance in Neutralisation Titrations
	End point and Equivalence point of Neutralisation titrations
28-07-2022	Determination of End point by using
	i. Indicators causing colour change
	ii. Change in potential, (by potentiometry)
	iii. Change in conductance (by conductometry)
02-08-2022	Construction of titration curve (on the basis of change in pH) of a titration of
	i. Strong acid-weak base
	ii. Strong base-weak acid
03-08-2022	General Introduction to Gravimetry
	Types of Gravimetric Methods –
	Precipitation Gravimetry:
	i. Steps involved in precipitation gravimetry analysis
	ii. Conditions for precipitation
	iii. Completion of precipitation,
04-08-2022	Role of Digestion, Filtration, Washing, Drying Ignition of precipitate
10-08-2022	Applications of Gravimetric Analysis: Determination of sulfur in organic compounds; Estimation of Nickel in Cu-Ni alloy using dimethyl glyoxime; Determination of Aluminum by converting it to its
11-08-2022	Instrumental Methods-I
	Basic Concepts in Instrumental methods
	Relation between the Analyte, Stimulus and measurement of change in the observable property.
	Block Diagram of an Analytical instrument.
17-08-2022	Types of Analytical Instrumental methods based on
	i. Optical interactions (eg. Spectrometry: uv-visible, Polarimetry)
	ii. Electrochemical interactions (eg. Potentiometry, Conductometry,)
	iii. Thermal interactions (eg. Thermogravimetry)
18-08-2022	Spectrometry
	Interaction of electromagnetic radiation with matter: Absorption and Emission spectroscopy
23-08-2022	Basic Terms: Radiant Power, Absorbance, Transmittance, Monochromaticlight, Polychromatic light, Wavelength of maximum absorbance, Absorptivity and Molar Absorbtivity

24-08-2022	Statement of Beer's Law and Lambert's Law, Combined Mathematical
	Expression of Beer -Lambert's Law
25-08-2022	Validity of Beer-Lambert's Law,
	Deviations from Beer-Lambert's Law
30-08-2022	Instrumentation for absorption spectroscopy: Colorimeters and Spectrophotometers
06-09-2022	Block Diagrams for Single beam and Colorimeter, and Spectrophotometer
07-09-2022	Principles, Construction
08-09-2022	Working-Details of Components
13-09-2022	source ,Sample holder , Filters/Monochromators
	Detectors such as Photomultiplier tube
14-09-2022	Applications of UV-Visible Spectrophotometry
	Qualitative analysis such as Identification of functional groups in Organic compounds ,Chromophores and Auxochrome,cis and trans isomers
15-09-2022	Quantitative analysis by Calibration curve method
20-09-2022	Photometric Titrations: Principle ,Instrumentation
21-09-2022	Types of Photometric
	titration Curves with examples
22-09-2022	Revision of Unit-I & II
27-09-2022	Revision of Unit-III
28-09-2022	Question answer discussion
29-09-2022	Question answer discussion

Date	**Topic**
15-06-2022	Syllabus Discussion
	Compound pendulum : Expression for period, maximum and minimum time period
16-06-2022	centres of suspension and oscillations , reversible compound pendulum
18-06-2022	Kater's reversible pendulum
22-06-2022	compound pendulum and simple pendulum- a relative study.
23-06-2022	Center of Mass , .Motion of the Center of Mass , Linear momentum of a Particle Linear momentum of a System of Particles
25-06-2022	Linear momentum wrt CM coordinate (i.e shift of origin from Lab to CM), Conservation of Linear Momentum
29-06-2022	Some Applications of the Momentum Principle , System of Variable Mass
30-06-2022	Torque Acting on a Particle , Angular Momentum of a Particle
02-07-2022	Angular Momentum of System of Particles , Total angular momentum wrt CM coordinate
06-07-2022	Conservation of Angular Momentum
07-07-2022	Oscillations
09-07-2022	The Simple Harmonic Oscillator
13-07-2022	Relation between Simple Harmonic Motion and Uniform Circular Motion
14-07-2022	Two Body Oscillations, Damped Harmonic Motion
16-07-2022	Forced Oscillations and Resonance

UNIT –II

Date	**Topic**
20-07-2022	(Review of zeroth and first law of thermodynamics)
21-07-2022	Conversion of heat into work
23-07-2022	heat engine, Carnot's cycle: its efficiency
27-07-2022	heat engine, Carnot's cycle: its efficiency
28-07-2022	Second law of thermodynamics, Statements
30-07-2022	Equivalence of Kelvin and Plank statement

03-08-2022	Carnot's theorem
04-08-2022	Reversible and irreversible process
06-08-2022	Absolute scale of temperature.
10-08-2022	Clausius theorem, Entropy, Entropy of a cyclic process
11-08-2022	Reversible process, Entropy change, Reversible heat transfer
13-08-2022	Reversible process, Entropy change, Reversible heat transfer
17-08-2022	entropy change of an ideal gas, entropy of steam
18-08-2022	entropy and unavailable energy
20-08-2022	entropy and disorder, absolute entropy

UNIT –III

Date	Topic
24-08-2022	Third law of thermodynamics
25-08-2022	Nernst heat theorem, Consequences of the third law
27-08-2022	Maxwell's thermodynamic relations
07-09-2022	Clausius – Clapeyron equation
08-09-2022	Thermal Expansion
10-09-2022	Steam engine, Rankine cycle
14-09-2022	Otto engine, Efficiency of Otto cycle
15-09-2022	Diesel cycle, Efficiency of Diesel cycle
17-09-2022	Otto and diesel comparison
21-09-2022	Problem
22-09-2022	Low temp Physics: Different methods of liquefaction of gases
24-09-2022	methods of freezing, Cooling by evaporation, cooling by adiabatic expansion Joule - Thompson effect
28-09-2022	JT effect of Van der Waal's gas, Liquefaction of helium
29-09-2022	properties and uses of liquid Helium
30-09-2022	Problem

S.Y.B.Sc. Physics Sem - III Paper - II Vector calculus, Analog Electronics

Unit I: Vector Calculus:

Date	Topic
13-06-2022	Syllabus Discussion
14-06-2022	Line, Surface and Volume Integrals
15-06-2022	The Fundamental Theorem of Calculus, The Fundamental Theorem of Gradient,
20-06-2022	he Fundamental Theorem of Divergence
21-06-2022	The Fundamental Theorem of Curl (Statement and Geometrical interpretation is included, Proof of these theorems are omitted
22-06-2022	The Fundamental Theorem of Curl (Statement and Geometrical interpretation is included, Proof of these theorems are omitted
27-06-2022	Problems based on these theorems are required to be done
28-06-2022	Problems based on these theorems are required to be done
29-06-2022	Curvilinear Coordinates: Cylindrical Coordinates
04-07-2022	Curvilinear Coordinates: Cylindrical Coordinates
05-07-2022	Curvilinear Coordinates: Spherical Coordinates
06-07-2022	Curvilinear Coordinates: Spherical Coordinates
11-07-2022	problems

Date	Topic
12-07-2022	**Unit II: Analog Electronics, Introduction**
13-07-2022	Transistor Biasing, Inherent Variations of Transistor Parameters, Stabilisation
18-07-2022	Essentials of a Transistor Biasing Circuit, Stability Factor, Methods of Transistor Biasing
19-07-2022	Base Resistor Method, Emitter Bias Circuit, Circuit analysis of Emitter Bias
20-07-2022	Biasing with Collector Feedback Resistor
25-07-2022	Voltage Divider Bias Method, Stability factor for Potential Divider Bias
26-07-2022	General amplifier characteristics: Concept of amplification, amplifier notations
27-07-2022	current gain, Voltage gain, power gain
01-08-2022	input resistance, output resistance
02-08-2022	general theory of feedback, reasons for negative feedback
03-08-2022	loop gain
08-08-2022	Practical circuit of transistor amplifier
10-08-2022	phase reversal
17-08-2022	frequency response
22-08-2022	Decibel gain and Band width
Unit III: Analog Electronics	
Date	**Topic**
23-08-2022	Oscillators: Introduction, effect of positive feedback.
24-08-2022	Requirements for oscillations, phase shift oscillator
29-08-2022	Wien Bridge Oscillator
30-08-2022	Colpitt's oscillator
05-09-2022	Hartley oscillator
06-09-2022	Operational Amplifiers: Introduction, Schematic symbol of OPAMP
07-09-2022	Output voltage from OPAMP
12-09-2022	AC analysis
13-09-2022	Bandwidth of an OPAMP, Slew rate
14-09-2022	Frequency Response of an OPAMP, OPAMP with Negative feedback
19-09-2022	Inverting Amplifier, Non-Inverting Amplifier
20-09-2022	Voltage Follower, Summing Amplifier
21-09-2022	Applications of Summing amplifier, OPAMP Integrator and Differentiator
26-09-2022	Critical frequency of Integrator, Comparator
27-09-2022	problems
28-09-2022	revision
29-09-2022	revision

S.Y.B.Sc. Physics Sem - III Paper - III Applied Physics - I

Unit 1 : Acoustics , Lasers and fibre optics

Date	Topic
13-06-2022	**Acoustics of Buildings**: Reverberation, Sabine's formula
14-06-2022	Absorption coefficient, Acoustics of Buildings
18-06-2022	factors affecting Acoustics of Buildings, Sound distribution in an auditorium
20-06-2022	**Laser** : Introduction, transition between Atomic energy states
21-06-2022	Principle of Laser, Properties of Laser
25-06-2022	Helium–Neon Laser
27-06-2022	Application of Laser, Holography
28-06-2022	problems based on chapters
02-07-2022	**Fibre Optics** : Light propagation through Fibres
04-07-2022	Fibre Geometry, Internal reflection
05-07-2022	Numerical Aperture, Step-Index and Graded-Index Fibres
09-07-2022	Applications of Fibres

Unit II : Biophysics

Date	Topic
11-07-2022	Introduction, definition, History & scope of biophysics
12-07-2022	biological fluids, physico-chemical properties, viscosity, surface tension, pH
16-07-2022	osmosis, osmotic pressure. Diffusion, Ficks' laws of diffusion
18-07-2022	Ficks' laws of diffusion
19-07-2022	dialysis, Cell is unit of life, fundamental understanding prokaryotic and eukaryotic cell structure and function
23-07-2022	eukaryotic cell membrane, Fundamentals of transport process through biological membrane
25-07-2022	membrane channels. electrical properties of cell, Action potential, propagation of action potential
26-07-2022	methods of measurement of action potential
30-07-2022	Nernst equation, Golman equation
01-08-2022	The Hodgkin-Huxely model of action potential
02-08-2022	voltage clamp technique
06-08-2022	Patch clamp technique
08-08-2022	cell impedance and capacitance

Unit III : Materials – properties and applications

Date	Topic
13-08-2022	**Introduction to Materials** Classification of Materials based on structures and Functionality
20-08-2022	Types of Materials: Metals and alloys, Ceramics, Polymers and Composites
22-08-2022	Thin Films, Nanomaterials
23-08-2022	Some Physical and Chemical methods of materials synthesis
27-08-2022	Some Physical and Chemical methods of materials synthesis
29-08-2022	**Properties of materials** Electrical Properties: Review of energy band diagram for materials - conductors, semiconductors and insulators
30-08-2022	Electrical conductivity in metals, semiconductors and insulators
05-09-2022	effect of temperature on conductivity
06-09-2022	Optical Properties: Reflection, refraction, absorption and transmission of electromagnetic radiation in solids
10-09-2022	Magnetic Properties: Origin of magnetism in solids (basic idea)
12-09-2022	Types of magnetic order (paramagnetism, diamagnetism, antiferro magnetism, ferromagnetism, ferrimagnetism)
13-09-2022	magnetic hysteresis
17-09-2022	Applications Optical materials: LEDs, OLEDs,
19-09-2022	LCDs, Flat Panel Displays
20-09-2022	optical fibers Dielectric materials: Piezoelectric
24-09-2022	ferroelectric and pyroelectric materials
26-09-2022	Magnetic Materials: Soft magnets, Hard magnets for permanent magnets, Magnetic Recording and Storage
27-09-2022	revision