



“the STOP to train minds”

NEET • JEE • (10+2)Science

“Your Destination towards your Dream”

COURSES offered:

- **PCP01/XI-XII: 2 YEARS Integrated COURSE (PCM/PCB/PCMB) BOARD + (MEDICAL NEET (UG) / ENGINEERING JEE) FOR CLASS 11 STUDENTS (All Boards)**
- **PCP02/XII: 1 YEAR Integrated COURSE(PCM/PCB/PCMB) BOARD + (MEDICAL NEET (UG) / ENGINEERING JEE) FOR CLASS 12 STUDENTS (All Boards)**
- **PCC03/NEET (UG) : SPECIAL ONE YEAR COURSENEET (UG) FOR CLASS 12 PASSED DEDICATED ASPIRANTS(REPEATERS BATCH)**
- **PCC04/JEE (ENG):SPECIAL ONE YEAR COURSEJEE (Main and Advanced), WBJEE (ENG) FOR CLASS 12 PASSED STUDENTS (REPEATERSBATCH)**
- **DLP05/NEET: FOR CLASS 12 PASSED STUDENTS**
- **DLP06/JEE: FOR CLASS 12 PASSED STUDENTS**
- **DLP07/XI-XII: 2 YEARS COURSE (PCM / PCB/PCMB) JEE (Main and Advanced), WBJEE (ENG), NEET (UG) FOR CLASS 11 STUDENTS (All Boards)**
- **DLP08/XII: ONE YEAR COURSE (PCM/PCMB/PCMB) JEE (MAIN and ADVANCED), WBJEE (ENG), NEET (UG) FORCLASS 12 STUDENTS (All Boards)**

- **Special Batch** Exclusively for **Narendrapur Ramakrishna Mission's** Students in Summer Recess and PujaVacation.

[All Courses are structured for Optimum success inBOARDS and COMPETITIVE EXAMS]

#DPP (DAILY PRACTICE PAPERS); #PCP (PLATFORM CLASSROOM PROGRAM); #PCC(PLATFORM CLASSROOM COACHING); #PCB(PHYSICS, CHEMISTRY, BIOLOGICAL SCIENCE);#PCM(PHYSICS, CHEMISTRY, MATHEMATICS); # DLP (DISTANCE LEARNING PROGRAM); # PMT(PLATFORM MAJOR TEST) # PTS (PLATFORM TEST SERIES)

Office Address:

**5 Central Road, 1st Floor, Jadavpur, Kolkata -32
(Near Jadavpur University Gate No. 02 / 8B, Bus Stand)**

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f: /platformedu,  PLATFORM EDUCATION

Contact No.:  9836255656,  6291161329,  033 79629938

OUR SERVICE:

(i) PCP01/XI-XII:

- **DPP – 50 Units On Each Subject with Solution**
- **Study Materials – 20 BOOKS On Each Subject**
- **PLATFORM TEST SERIES :**
- **CLASS XI: 1 PTS on BOARDS (40 Marks) , 2 PTS (25 Questions) On COMPETITIVE EXAM, 1 MOCK On BOARD (PCMBEB) and 1 MOCK On COMPETITIVE EXAM**
- **CLASS XII: 2 PTS (40 Marks) On BOARDS, 2 MOCKS On BORDS(PCMBEB), 7 PMT (180 Questions) on NEET , 10 NEET MOCK/ 5 PMT (90 Questions)on JEE, 4 JEE (Main) MOCKS, 2 WBJEE (ENG) MOCKS**

(ii) PCP02/XII:

- **DPP – 25 Units On Each Subject with Solution**
- **Study Material MODULE – 10 BOOKS On Each Subject**
- **PLATFORM TEST SERIES :**
- **CLASS XII: 2 PTS (40 Marks) On BOARDS , 2 BOARDS MOCK(PCMBEB), 7 PMT (180 Questions) on NEET , 10 NEET MOCK, 4 JEE (Main) MOCK, 2 WBJEE (ENG) MOCK**

(iii) PCC03 /NEET:

- **DPP -75 Units On Each Subject With Solution**
- **STUDY MATERIAL Module Wise - 6 BOOKS On Each Subject**
- **7 PMT (180 Questions) and 10 MOCK**

(iv) PCC04/JEE:

- **DPP -150 Units On Each Subject With Solution**
- **STUDY MATERIALS Module Wise - 6 BOOKS On Each Subject**
- **5 PMT (90 Questions) and 4 JEE (Main) MOCK, 2 WBJEE MOCK**

(v) DLP05/NEET:

- DPP - 75Units On Each Subject With Solution
- STUDY MATERIALS MODULE WISE - 6 BOOKS On Each Subject
- 7 PMT (200 question) and 10 MOCK

(vi) DLP06/JEE:

- DPP -150 Units On Each Subject With Solution
- STUDY MATERIALS MODULE WISE - 6 BOOKS On Each Subject
- 5 PMT (90 Questions), 4 JEE(Main) MOCK, 2 WBJEE MOCK

(vii) DLP07/XI –XII:

- DPP – 150 Units On Each Subject with Solution
- Study Materials – 20 BOOKS On Each Subject
- PLATFORM TEST SERIES :
 - CLASS XI: 1 PTS on BOARDS (40 Marks) , 1 PTS (25 Questions) On COMPETITIVE EXAM, 1 MOCK On BOARD (PCMBEB) and 1 MOCK On COMPETITIVE EXAM
 - CLASS XII: 2 PTS On BOARDS (40 Marks) , 2 BOARDS MOCK (PCMBEB), 7 PMT (180 Questions) on NEET , 10 NEET MOCK/ 5 PMT(90 Questions) ,4 JEE (Main) MOCK, 2 WBJEE (ENG) MOCK

(viii) DLP08/XII

- DPP – 150 Units On Each Subject with Solution
- Study Materials MODULE WISE – 6 BOOKS On Each Subject
- PLATFORM TEST SERIES : CLASS XII: 2 PTS On BOARDS (40 Marks) , 2 BOARDS MOCK (PCMBEB), 7 PMT(200 Questions) on NEET , 10 NEET MOCK/5 PMT (90 Questions)on JEE, 4 JEE (Main) MOCK, 2 WBJEE (ENG) MOCK,

Salient Features:

- Audio- Visual Classes
- Online Interactive Live Class
- Offline Physical Class Super 30 Batch
- Target 90 Biology Questions out of 100.
- DPP (DAILY PRACTICE PAPERS) – 75 Units On Each Subject for NEET / JEE
- EFFECTIVE STUDY MATERIALS
- ORGANISED PLATFORM TEST SERIES
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- Special Individual Guidance(SIG)
- Small Batches (MEDICAL &ENGINEERING2 Years SUPER-30 Batches for CLASS XI, 1 Year SUPER-30 for class XII and 1 Year SUPER-30Repeater)
- Students can take Guidance for individual Subject also.
- Weekly Test on Respective Subject
- Continuous Feedback from Students to provide Need Based Teaching Classes
- Well prepared Mock Tests at par NEET/ JEE with proper Model Answers
- Research Based Techniques and Quicker Method for Problem Solving of PHYSICS, CHEMISTRY & MATHEMATICS with Advanced Formulae
- Chaining Method with Rhythmical Correlation and Logics to control over Biological Science and Biological Science by Mathematics
- Monthly Parent-Teachers Meeting for monitoring their Wards
- Students can have to access any faculty on demand to share their Subject Related Problems

Documents to be submitted

- ❖ Four copies stamp size photographs
- ❖ Properly filled-up admissions form
- ❖ Xerox copy of Mark Sheet & Admit of 10th and (10+2) standard at the time of admission.
- ❖ Xerox Copy of Aadhaar Card for Hostel

Rules and Regulations

- All information will be provided by office assistant except academic matters
- Fees by Two/Three to the paid installments
- Intimate to the official if any change of phone number or contact number.
- Name should strike out if any student is absent for three consecutive classes without information.
- Appearing in any examination cannot be avoided without prior intimation of the proper reason.
- Name to the strike out if student violates the basic discipline and rules.
- Guardian of individual will be intimate students' performance of their wards accordingly.
- Students have to be present in the classroom 10minutes before the starting of classes.
- Any examination cannot be avoided without prior intimation.

For Students appearing

MEDICAL NEET:



5 Central Road, Jadavpur, Kolkata – 32

RECOMMENDED BOOKS:

Medical NEET-UG

- BIOLOGY, CHEMISTRY, PHYSICS **NCERT** TEXT BOOK (NCERT TEXT BOOK IS MANDATORY)
[NCERT TEXT BOOK BIOLOGY VOL – I (XI),
NCERT BIOLOGY TEXT BOOK VOL – II (XII)]
- **Masters The NCERT**(PHYSICS / CHEMISTRY / BIOLOGY) By ARIHANT Vol- I (XI), Vol –II (XII)
- PHYSICS, CHEMISTRY, BIOLOGY EXEMPLER

REFERENCE TEXT BOOK

- PHYSICS: REFERENCE TEXT: GRB Publication.
- BIOLOGY REFERENCE TEXT: GRB Publication.
- CHEMISTRY REFERENCE TEXT: GRB Publication.
- Companion Biology or Truemaan Biology

For QUICKREVISION

- *Rapid Biology, Chemistry and Physics* by MTG Publication
- *PHYSICS QUIKE* By Shaheed-ul Islam (PLATFORM EDUCATION, Jadavpur)

MCQs FOR SELF PRACTICE:

- ✓ NEET OBJECTIVE (MCQs) On BIOLOGY / PHYSICS / CHEMISTRY BY GRB Publication / ARIHANT PUBLICATION / MTG Publication.

OR

- ✓ GRB MCQs Series ON PHY/CHEM/BIO
- ✓ *MCQs Finger Print Biology* by **Rahul Chawla** (MTG Publication)
- ✓ 30 Years AIPMT /NEET Year wise Questions with Solution by GRB Publication / Arihant Publication / MTG
- ✓ At Least 5 Years JEE Main Question with solution By Authentic Publication / GRB Publication

JEE/ WBJEE ENGINEERING:

- *NCERT Physics* for Class XI and XII (Good Introduction)
- *Concept of PHYSICS Text Books Of Class XI and XII* By H C VERMA + Solution of Concepts of Physics (Part -1 and Part -2) By P. Verma (R.K.Publication)
- *Cengage Publication MCQs.*
- ***New Pattern PHYSICS By D. C. Pandey (Arihant Publication) / McGraw Hill Education WE series Complete Physics JEEMain.***
- *IIT Mathematics* by R.DSharma
- *The Pearson Guide to Complete Mathematics for JEE* by SLLoney
- *ABC of Modern Chemistry*
- *Pearson Publication MCQs Chemistry*
- *15 Years AIEEE Question Series and 5 Years JEE (Main/Advanced) questions Series by Any Authentic Publication.*

PLATFORM TEST SERIES
For
CLASSROOM and DLP STUDENTS

NEET (UG) TESTSERIES

- **PMT: 01** 200 Questions[PHY 50 Questions; CHEM50 Questions; BIO 100 Questions]
- **PMT: 02** 200 Questions[PHY 50 Questions; CHEM 50 Questions; BIO 100 Questions]
- **PMT: 03** 200 Questions[PHY 50 Questions; CHEM 50 Questions; BIO 100 Questions]
- **PMT: 04** 200 Questions[PHY 50 Questions; CHEM 50 Questions; BIO 100 Questions]+ PMT -01 Syllabi
- **PMT: 05** 200 Questions[PHY 50 Questions; CHEM 50 Questions; BIO 100 Questions]+ PMT 02 Syllabi
- **PMT: 06** 200 Questions[PHY 50 Questions; CHEM 50 Questions; BIO 100 Questions]+ PMT 03 Syllabi
- **PMT: 07** 200 Questions[PHY 50 Questions; CHEM 50 Questions; BIO 100 Questions]+ PMT 04 Syllabi
- **NEET MOCK (PCB) :01 -10** (Full Syllabi)

ENGINEERING ENTRANCE TEST SERIES

- **PMT: 01** 90 Questions [PHY 30 Questions; CHEM 30 Questions; MATH 30 Questions]
- **PMT: 02** 90 Questions [PHY 30 Questions; CHEM 30 Questions; MATH 30 Questions]
- **PMT: 03** 90 Questions [PHY 30 Questions; CHEM 30 Questions; MATH 30 Questions]
- **PMT: 04** 90 Questions [PHY 30 Questions; CHEM 30 Questions; MATH 30 Questions]
- **PTM: 05** 90 Questions [PHY 30 Questions; CHEM 30 Questions; MATH 30 Questions]
- **JEE (Mains) MOCK (PCM) : 01 – 04**
- **WBJEE (ENG.) MOCK (PCM): 01- 02**
- **JEE (Advanced) MOCK(PCM): 01 -02**

PHYSICS

PMT-01

UNIT I: Units and dimensions (XI) 6 Hours

- *Physics*: Scope and excitement; nature of physical laws; Physics, technology, and society.

- *Need for measurement*: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass, and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures.

- Dimensions of physical quantities, dimensional analysis, and its applications.

UNIT II: Kinematics (XI) 12 hours

- A frame of reference, Motion in a straight line; Position-time graph, speed, and velocity. Uniform and non-uniform motion, average speed, and instantaneous velocity. Uniformly accelerated motion, velocity-time, and position-time graphs, for uniformly accelerated motion (graphical treatment).

- Elementary concepts of differentiation and integration for describing motion. *Scalar and vector quantities*: Position and displacement vectors, general vectors, general vectors and notation, equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors. Relative velocity.

- Unit vectors. Resolution of a vector in a plane-rectangular component.

- Scalar and Vector products of Vectors. Motion in a plane. Cases of uniform velocity and uniform acceleration- projectile motion. Uniform circular motion.

Unit VII: Properties of Bulk Matter (XI) 6 Hours

- Elastic behavior, Stress-strain relationship. Hooke's law, Young's modulus, bulk modulus, shear, modulus of rigidity, poisson's ratio; elastic energy.
- Viscosity, Stokes' law, terminal velocity, Reynold's number, streamline and turbulent flow. Critical velocity, Bernoulli's theorem and its applications.
- Surface energy and surface tension, angle of contact, excess of pressure, and application of surface tension ideas to drops, bubbles and capillary rise.

PMT- 02

Unit III: Laws of Motion (XI) 8 Hours

- Intuitive concept of force. Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion. Law of conservation of linear momentum and its applications.
- Equilibrium of concurrent forces. Static and Kinetic friction, laws of friction, rolling friction, lubrication.
- *Dynamics of uniform circular motion.* Centripetal force, examples of circular motion (vehicle on level circular road, vehicle on banked road).

Unit IV: Work, Energy and Power (XI) 6 Hours

- Work done by a constant force and variable force; kinetic energy, work-energy theorem, power.
- Notion of potential energy, the potential energy of a spring, conservative forces; conservation of mechanical energy (kinetic and potential energies); non conservative forces; motion in a vertical circle, elastic and inelastic collisions in one and two dimensions.

Unit VIII: Atoms and Nuclei (XII) 8 Hours

- Alpha- particle scattering experiments; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum. Composition and size of nucleus, atomic masses, isotopes, isobars; isotones.
- Radioactivity- alpha, beta and gamma particles/ rays and their properties decay law. Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number, nuclear fission and fusion.

PMT– 03

Unit II: Current Electricity (XII) 10 Hours

- Electric current, the flow of electric charges in a metallic conductor, drift velocity and mobility, and their relation with electric current; Ohm's law, electrical resistance, $V-I$ characteristics (linear and non-linear), electrical energy and power, electrical resistivity, and conductivity.
- Carbon resistors, color code for carbon resistors; series and parallel combinations of resistors; temperature dependence of resistance.
- Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel.
- Kirchhoff's laws and simple applications. Wheatstone bridge, Metre Bridge.
- Potentiometer-principle and applications to measure potential difference, and for comparing emf of two cells; measurement of internal resistance of a cell.

Unit VII: Properties of Bulk Matter (XI) 10 Hours

- Heat, temperature, thermal expansion; thermal expansion of solids, liquids, and gases. Anomalous expansion. Specific heat capacity: C_p , C_v - calorimetry; change of state – latent heat.
- Heat transfer- conduction and thermal conductivity, convection

and radiation. Qualitative ideas of Black Body Radiation, Wein's displacement law, and Green House effect.

- Newton's law of cooling and Stefan's law.

Unit I: Electrostatics (XII) 4 Hours

- Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarization, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor, Van de Graaff generator.

PMT– 04 + PMT -01 Syllabi

Unit V: Electromagnetic Waves (XII) 2 Hour

- Need for displacement current.
- Electromagnetic waves and their characteristics (qualitative ideas only). Transverse nature of electromagnetic waves.
- Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, x-rays, gamma rays) including elementary facts about their uses.

Unit IX: Behavior of Perfect Gas and Kinetic Theory (XI) 2 Hours

- Equation of state of a perfect gas, work done on compressing a gas.
- *Kinetic theory of gases*: Assumptions, concept of pressure. Kinetic energy and temperature; degrees of freedom, law of equipartition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path.

Unit VIII: Thermodynamics (XI) 6 Hours

- Thermal equilibrium and definition of temperature (zeroth law of Thermodynamics). Heat, work and internal energy. First law of thermodynamics. Isothermal and adiabatic processes.
- *Second law of the thermodynamics*: Reversible and irreversible processes. Heat engines and refrigerators.

Unit VII: Dual Nature of Matter and Radiation (XII) 4 Hours

- Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation- particle nature of light.
- Matter waves- wave nature of particles, de Broglie relation. Davisson-Germer experiment (experimental details should be omitted; only conclusion should be explained).

Unit IX: Electronic Devices (XII) 8 Hours

- Energy bands in solids (qualitative ideas only), conductors, insulators and semiconductors; semiconductor diode- I - V characteristics in forward and reverse bias, diode as a rectifier; I - V characteristics of LED, diode, solar cell, and Zener diode; Zener diode as a voltage regulator. Junction transistor, transistor action, characteristics of a transistor; transistor as an amplifier (common emitter configuration) and oscillator. Logic gates (OR, AND, NOT, NAND and NOR). Transistor as a switch.

PMT – 05 + PMT – 02 Syllabi

Unit VI: Optics (XII) 16 Hours

- Reflection of light, spherical mirrors, mirror formula. Refraction of light, total internal reflection and its applications optical fibres, refraction at spherical surfaces, lenses, thin lens formula, lens-maker's formula. Magnification, power of a lens, combination of thin lenses in contact combination of a lens and a mirror. Refraction and dispersion of light through a prism.

- Scattering of light- blue colour of the sky and reddish appearance of the sun at sunrise and sunset.
- *Optical instruments:* Human eye, image formation and accommodation, correction of eye defects (myopia and hypermetropia) using lenses.
- Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.
- *Wave optics:* Wavefront and Huygens' Principle, reflection and refraction of plane wave at a plane surface using wavefronts.
- Proof of laws of reflection and refraction using Huygens' Principle.
- Interference, Young's double hole experiment and expression for fringe width, coherent sources and sustained interference of light.
- Diffraction due to a single slit, width of central maximum.
- Resolving power of microscopes and astronomical telescopes. Polarisation, plane polarized light; Brewster's law, uses of plane polarized light and Polaroids.

Unit IV: Electromagnetic Induction and Alternating Currents (XII) 8 Hours

- Electromagnetic induction; Faraday's law, induced emf and current; Lenz's Law, Eddy currents. Self and mutual inductance.
- Alternating currents, peak and rms value of alternating current/voltage; reactance and impedance; LC oscillations (qualitative treatment only), LCR series circuit, resonance; power in AC circuits, wattless current.
- AC generator and transformer.

PMT– 06 + PMT - 03 Syllabi

Unit I: Electrostatics (XII) 8 Hours

- Electric charges and their conservation. Coulomb's law-force between two point charges, forces between multiple charges; superposition principle and continuous charge distribution.
- Electric field, electric field due to a point charge, electric field lines; electric dipole, electric field due to a dipole; torque on a dipole in a uniform electric field.
- Electric flux, statement of Gauss's theorem and its applications to find field due to infinitely long straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell (field inside and outside)
- Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges: equi potential surfaces, electrical potential energy of a system of two point charges and of electric dipoles in an electrostatic field.

Unit III: Magnetic Effects of Current and Magnetism (XII) 10 Hours:

- Concept of magnetic field, Oersted's experiment. Biot-Savart law and its application to current carrying circular loop.
- Ampere's law and its applications to infinitely long straight wire, straight and toroidal solenoids. Force on a moving charge in uniform magnetic and electric fields. Cyclotron.
- Force on a current-carrying conductor in a uniform magnetic field. Force between two parallel current-carrying conductors- definition of ampere. Torque experienced by a current loop in amagnetic field; moving coil galvanometer-its current sensitivity and conversion to ammeter and voltmeter.

- Current loop as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment of a revolving electron. Magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis. Torque on a magnetic dipole (bar magnet) in a uniform magnetic field; bar magnet as an equivalent solenoid, magnetic field lines; Earth's magnetic field and magnetic elements.

- Para-, dia- and ferro-magnetic substances, with examples.
- Electromagnetic and factors affecting their strengths. Permanent magnets.

Unit VI: Gravitation (XI) 4 Hours

- Kepler's laws of planetary motion. The universal law of gravitation. Acceleration due to gravity and its variation with altitude and depth.

- Gravitational potential energy; gravitational potential. Escape velocity, orbital velocity of a satellite. Geostationary satellites.

PMT – 07 + PMT -04 Syllabi

Unit V: Motion of System of Particles and Rigid Body (XI) 8 Hours:

- Centre of mass of a two-particle system, momentum conservation, and centre of mass motion. Centre of mass of a rigid body; centre of mass of uniform rod.

- Moment of a force, -torque, angular momentum, conservation of angular momentum with some examples.

- Equilibrium of rigid bodies, rigid body rotation, and equation of rotational motion, comparison of linear and rotational motions; the moment of inertia, the radius of gyration. Values of M.I. for simple geometrical objects (no derivation). Statement of parallel and perpendicular axes theorems and their applications.

Unit X: Oscillations (XI) 6 Hours

• Periodic motion-period, frequency, displacement as a function of time. Periodic functions. Simple harmonic motion(SHM) and its equation; phase; oscillations of a spring-restoring force and force constant; energy in SHM –Kinetic and potential energies; simple pendulum-derivation of expression for its time period; free, forced and damped oscillations (qualitative ideas only), resonance.

Unit X: Waves (XI) 8 Hours

• Wave motion. Longitudinal and transverse waves, speed of wave motion. Displacement relation for a progressive wave. Principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, fundamental mode and harmonics. Beats. Doppler Effect

FOR only ENGINEERING ENTRANCE EXAM

Unit X: Communication Systems (XII) 4 Hours

Elements of a communication system (block diagram only); bandwidth of signals (speech, TV and digital data); bandwidth of transmission medium. Propagation of electromagnetic waves in the atmosphere, sky and space wave propagation. Need for modulation. Production and detection of an amplitude-modulated Wave

CHEMISTRY

NB: (GOC exam under PMT -04)

PMT-01

Unit I: Some Basic Concepts of Chemistry: 6 Hours

•*General Introduction:* Important and scope of chemistry.
•Laws of chemical combination, *Dalton's atomic theory:* concept of elements, atoms and molecules.
• Atomic and molecular masses. Mole concept and molar mass; percentage composition and empirical and molecular formula; chemical reactions, stoichiometry and calculations based on stoichiometry.

Unit II: Structure of Atom (XI) 8 Hours

- Atomic number, isotopes and isobars. Concept of shells and subshells, dual nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle, concept of orbital, quantum numbers, shapes of s,p and d orbitals, rules for filling electrons in orbitals- Aufbau principle, Pauli exclusion principles and Hund's rule, electronic configuration of atoms, stability of half-filled and completely filled orbitals.

Unit VIII: Redox Reactions (XI) 3 Hours

- Concept of oxidation and oxidation and reduction, redox reactions oxidation number, balancing redox reactions in terms of loss and gain of electron and change in oxidation numbers.

Unit III: Classification of Elements and Periodicity in Properties (XI) 4 Hours

- Modern periodic law and long form of periodic table, periodic trends in properties of elements atomic radii, ionic radii, ionization enthalpy, and electron gain enthalpy, electronegativity, and valence

Unit IX: Hydrogen (XI) 2 Hours

- Occurrence, isotopes, preparation, properties and uses of hydrogen; hydrides ionic, covalent and interstitial; physical and chemical properties of water, heavy water; hydrogen peroxide preparation, reactions, uses and structure;

PMT-02

Unit XII: Organic Chemistry – Some Basic Principles and Techniques (XI) 8 Hours

- General introduction, methods of purification qualitative and quantitative analysis, classification and IUPAC nomenclature of organic compounds.
- Electronic displacements in a covalent bond: inductive effect, electrometric effect, resonance and hyper conjugation.

- Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions; electrophiles and nucleophiles, types of organic reactions.

Unit IV: Chemical Bonding and Molecular Structure (XI) 10 Hours

- Valence electrons, ionic bond, covalent bond, bond parameters, Lewis structure, polar character of covalent bond, valence bond theory, resonance, geometry of molecules, VSEPR theory, concept of hybridization involving *s*, *p* and *d* orbitals and shapes of some simple molecules, molecular orbital theory of homonuclear diatomic molecules (qualitative idea only). Hydrogen bond.

Unit I: Solid State (XII) 6 Hours

- Classification of solids based on different binding forces; molecular, ionic covalent and metallic solids, amorphous and crystalline solids (elementary idea), unit cell in two dimensional and three dimensional lattices, calculation of density of unit cell, packing in solids, packing efficiency, voids, number of atoms per unit cell in a cubic unit cell, point defects, electrical and magnetic properties, Band theory of metals, conductors, semiconductors and insulators

PMT-03

Unit XII: Organic Chemistry – Some Basic Principles and Techniques (XI) 8 Hours

- General introduction, methods of purification qualitative and quantitative analysis, classification and IUPAC nomenclature of organic compounds.
- Electronic displacements in a covalent bond: inductive effect, electromeric effect, resonance and hyper conjugation.

- Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions; electrophiles and nucleophiles, types of organic reactions

Unit X: s-Block Elements (Alkali and Alkaline earth metals) (XI) 4 Hours

- Group I and group II elements:
- General introduction, electronic configuration, occurrence, anomalous properties of the first element of each group, diagonal relationship, trends in the variation of properties (such as ionization enthalpy, atomic and ionic radii), trends in chemical reactivity with oxygen, water, hydrogen and halogens; uses.
- Preparation and Properties of Some important Compounds:
- Sodium carbonate, sodium chloride, sodium hydroxide and sodium hydrogencarbonate, biological importance of sodium and potassium.
- Industrial use of lime and limestone, biological importance of Mg and Ca.

Unit II: Solutions (XII) 4 Hours

- Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, colligative properties- relative lowering of vapour pressure, Raoult's law, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties abnormal molecular mass. Van Hoff factor.

Unit III: Electrochemistry (XII) 8 Hours

- Redox reactions, conductance in electrolytic solutions, specific and molar conductivity variation of conductivity with concentration, Kohlrausch's Law, electrolysis and Laws of electrolysis (elementary idea), dry cell- electrolytic cells and Galvanic cells; lead accumulator, EMF of a cell, standard electrode potential, Relation between Gibbs energy change and EMF of a cell, fuel cells; corrosion.

PMT – 04 + PMT -01 Syllabi

Unit XII: Organic Chemistry – Some Basic Principles and Techniques (XI) 4 Hours

- General introduction, methods of purification qualitative and quantitative analysis, classification and IUPAC nomenclature of organic compounds.
- Electronic displacements in a covalent bond: inductive effect, electromeric effect, resonance and hyper conjugation.
- Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions; electrophiles and nucleophiles, types of organic reactions, Elimination, Substitution

Unit XIII: Hydrocarbons (XI) 4 Hours

Classification of Hydrocarbons. Aliphatic Hydrocarbons:

- *Alkanes*- Nomenclature, isomerism, conformations (ethane only), physical properties, chemical reactions including free radical mechanism of alogenation, combustion and pyrolysis.

Unit V: States of Matter: Gases and Liquids (XI) 6 Hours

- Three states of matter, intermolecular interactions, types of bonding, melting and boiling points, role of gas laws of elucidating the concept of the molecule, Boyle's law, Charles' law, GayLussac's law, Avogadro's law, ideal behaviour of gases, empirical derivation of gas equation. Avogadro number, ideal gas equation. Kinetic energy and molecular speeds (elementary idea), deviation from ideal behaviour, liquefaction of gases, critical temperature.
- Liquid State- Vapour pressure, viscosity and surface tension (qualitative idea only, nonmathematical derivations).

Unit VI: Thermodynamics (XI) 8 Hours

- First law of thermodynamics-internal energy and enthalpy, heat capacity and specific heat, measurement of U and H, Hess's law of constant heat summation, enthalpy of : bond dissociation, combustion, formation, atomization, sublimation, phase transition, ionization, solution and dilution.
- Introduction of entropy as state function, Second law of thermodynamics, Gibbs energy change for spontaneous and non-spontaneous process, criteria for equilibrium and spontaneity.
- Third law of thermodynamics- Brief introduction.

PMT – 05 + PMT – 02 Syllabi

Unit XIII: Hydrocarbons (XI) 8 Hours

- *Alkanes*-Nomenclature, structure of double bond(ethene), geometrical isomerism, physical properties, methods of preparation: chemical reactions: addition of hydrogen, halogen, water, hydrogen halides (Markovnikov's addition and peroxide effect), ozonolysis, oxidation, mechanism of electrophilic addition.
- *Alkynes*-Nomenclature, structure of triple bond (ethyne), physical properties, methods of preparation, chemical reactions: acidic character of alkynes, addition reaction of- hydrogen, halogens, hydrogen halides and water.
- *Aromatic hydrocarbons*- Introduction, IUPAC nomenclature; Benzene; resonance, aromaticity; chemical properties: mechanism of electrophilic substitution-Nitration sulphonation, halogenation, Friedel Craft's alkylation and acylation; directive influence of functional group in mono-substituted benzene; carcinogenicity and toxicity.

Unit XI: Some p-Block Elements (XI) 4 Hours

- General Introduction to p-Block Elements.
- *Group 13 elements:* General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous properties of first element of the group; Boron, some important compounds: borax, boric acids, boron hydrides. Aluminium: uses, reactions with acids and alkalis.
- *General 14 elements:* General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous behaviour of first element. Carbon, allotropic forms, physical and chemical properties: uses of some important compounds: oxides.
- Important compounds of silicon and a few uses: silicon tetrachloride, silicones, silicates and zeolites, their uses.

Unit VII: p-Block Elements (XII) 2 Hours

- *Group 15 elements:* General introduction, electronic configuration, occurrence, oxidation states, trends in physical and chemical properties; preparation and properties of ammonia and nitric acid, oxides of nitrogen (structure only); Phosphorous-allotropic forms; compounds of phosphorous: preparation and properties of phosphine, halides (PCl_3 , PCl_5) and oxoacids (elementary idea only).

Unit V: Surface Chemistry (XII) 4 Hours

- Adsorption-physisorption and chemisorption; factors affecting adsorption of gases on solids, catalysis homogeneous and heterogeneous, activity and selectivity; enzyme catalysis; colloidal state: distinction between true solutions, colloids and suspensions; lyophilic, lyophobic multimolecular and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation; emulsions-types of emulsions.

Unit VII: Equilibrium (XI) 8 Hours

- Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of chemical equilibrium, equilibrium constant, factors affecting equilibrium- Le Chatelier's principle; ionic equilibrium- ionization of acids and bases, strong and weak electrolytes, degree of ionization, ionization of polybasic acids, acid strength, concept of pH., Hydrolysis of salts (elementary idea)., buffer solutions, Henderson equation, solubility product, common ion effect (with illustrative examples).

PMT – 06 + PMT - 03 Syllabi

Unit X: Haloalkanes and Haloarenes (XII) 4 Hours

- *Haloalkanes*: Nomenclature, nature of C –X bond, physical and chemical properties, mechanism of substitution reactions. Optical rotation.
- *Haloarenes*: Nature of C-X bond, substitution reactions (directive influence of halogen for monosubstituted compounds only).
- Uses and environment effects of – dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.

Unit XI: Alcohols, Phenols and Ethers (XII) 4 Hours

- *Alcohols*: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only); identification of primary, secondary and tertiary alcohols; mechanism of dehydration, uses with special reference to methanol and ethanol.
- *Phenols*: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophillic substitution reactions, uses of phenols.
- *Ethers*: Nomenclature, methods of preparation, physical and chemical properties uses.

Unit IV: Chemical Kinetics (XII) 4 Hours

- Rate of a reaction (average and instantaneous), factors affecting rates of reaction; concentration, temperature, catalyst; order and molecularity of a reaction; rate law and specific rate constant, integrated rate equations and half-life (only for zero and first order reactions); concept of collision theory (elementary idea, no mathematical treatment). Activation energy, Arrhenius equation.

Unit IX: Coordination Compounds (XII) 6 Hours

- Coordination compounds: Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds, isomerism (structural and stereo) bonding, Werner's theory VBT, CFT; importance of coordination compounds (in qualitative analysis, biological systems).

Unit VI: General Principles and Processes of Isolation of Elements (XII) 2 Hours

- *Principles and methods of extraction*- concentration, oxidation, reduction electrolytic method and refining; occurrence and principles of extraction of aluminium, copper, zinc and iron.

Unit VII: *p*-Block Elements (XII) 6 Hours

- *Group 16 elements*: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; dioxygen: preparation, properties and uses; classification of oxides; ozone. Sulphur – allotropic forms; compounds of sulphur: preparation, preparation, properties and uses of sulphur dioxide; sulphuric acid: industrial process of manufacture, properties and uses, oxo acids of sulphur (structures only).

- *Group 17 elements*: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; compounds of halogens: preparation, properties and uses of chlorine and hydrochloric acid, interhalogen compounds oxoacids of halogens (structures only).

- *Group 18 elements*: General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses.

PMT – 07 + PMT -04 Syllabi

Unit XII: Aldehydes, Ketones and Carboxylic Acids (XII) 10 Hours

- Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties; and mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes; uses.
- Carboxylic Acids: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

Unit XIII: Organic Compounds Containing Nitrogen (XII) 6 Hours

- *Amines*: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary secondary and tertiary amines.
- *Cyanides and Isocyanides*- will be mentioned at relevant places.
- *Diazonium salts*: Preparation, chemical reactions and importance in synthetic organic chemistry.

Unit XIV: Environmental Chemistry (XI) 2 Hours

- Environmental pollution: Air, water and soil pollution, chemical reactions in atmosphere, smogs, major atmospheric pollutants; acid rain ozone and its reactions, effects of depletion of ozone layer, greenhouse effect and global warming-pollution due to industrial wastes; green chemistry as an alternative tool for reducing pollution, strategy for control of environmental pollution.

Unit VIII: **d and f Block Elements (XII) 4 Hours**

- General introduction, electronic configuration, characteristics of transition metals, general trends in properties of the first row transition metals- metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation. Preparation and properties of $K_2Cr_2O_7$ and $KMnO_4$.
- *Lanthanoids*- electronic configuration, oxidation states, chemical reactivity, and lanthanoid contraction and its consequences.
- *Actinoids*: Electronic configuration, oxidation states and comparison with lanthanoids.

Unit XIV: **Biomolecules (XII) 4 Hours**

- *Carbohydrates*- Classification (aldoses and ketoses), monosaccharide (glucose and fructose), D.L. configuration, oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen): importance.
- *Proteins*- Elementary idea of α -amino acids, peptide bond, polypeptides, proteins, primary structure, secondary structure, tertiary structure and quaternary structure (qualitative idea only), denaturation of proteins; enzymes.
- *Hormones*- Elementary idea (excluding structure).
- *Vitamins*- Classification and function. • *Nucleic Acids*: DNA and RNA

Unit XV: **Polymers (XII)**

- *Classification*- Natural and synthetic, methods of polymerization (addition and condensation), copolymerization. Some important polymers: natural and synthetic like polyesters, bakelite; rubber, Biodegradable and non-biodegradable polymers.

Unit XVI: Chemistry in Everyday Life (XII)

- Chemicals in medicines analgesics, tranquilizers, antiseptics, disinfectants, antimicrobials, antifertility drugs, antibiotics, antacids, antihistamines.
- Chemicals in food- preservatives, artificial sweetening agents, **elementary idea of antioxidants.**
- Cleansing agents- soaps and detergents, cleansing action.

BIOLOGY

PMT-01

Chapter-1: The Living World: 2 Hours

- What is living? ; Biodiversity; Need for classification; Three domains of life; Taxonomy & Systematics; Concept of species and taxonomical hierarchy; Binomial nomenclature; Tools for study of Taxonomy – Museums, Zoos, Herbaria, Botanical gardens.

Chapter-2: Biological Classification: 4 Hours

- Five kingdom classification; salient features and classification of Monera; Protista and Fungi into major groups; Lichens; Viruses and Viroids.

Chapter-4: Animal Kingdom: 6 Hours

- Salient features and classification of animals-nonchordate up to phyla level and chordate up to classes level (three to five salient features and at least two examples).

Chapter-7: Structural Organisation in Animals 1:4 Hours

- Animal tissues; Morphology, anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect (cockroach). (Brief account only)

Chapter-16: Digestion and Absorption: 4 Hours

- Digestion and absorption; Alimentary canal and digestive glands; Role of digestive enzymes and gastrointestinal hormones; Peristalsis, digestion, absorption and assimilation of proteins, carbohydrates and fats; Caloric value of proteins, carbohydrates and fats; Egestion; Nutritional and digestive disorders – PEM, indigestion, constipation, vomiting, jaundice, diarrhoea.

PMT– 02

Chapter-3: Plant Kingdom: 8 Hours

- Salient features and classification of plants into major groups- Algae, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms (three to five salient and distinguishing features and at least two examples of each category); Angiosperms classification up to class, characteristic features and examples).

Chapter-8: Cell structure and functions 2: 6 Hours

- Cell theory and cell as the basic unit of life; Structure of prokaryotic and eukaryotic cell; Plant cell and animal cell; Cell envelope, cell membrane, cell wall; Cell organelles-structure and function; Endo membrane system-endoplasmic reticulum, Golgi bodies, lysosomes, vacuoles; mitochondria, ribosomes, plastids, micro bodies; Cytoskeleton, cilia, flagella, centrioles (ultrastructure and function); Nucleus-nuclear membrane, chromatin, nucleolus.

Chapter-9: Biomolecules: 6 Hours

- Chemical constituents of living cells: Biomolecules- structure and function of proteins, carbohydrates, lipids, nucleic acids; Enzymes-types, properties, enzyme action

Chapter-17: Breathing and Respiration: 8 Hours

- Breathing and Respiration: Respiratory organs in animals (recall only); Respiratory system in humans; Mechanism of breathing and its regulation in humans-Exchange of gases, transport of

gases and regulation of respiration Respiratory volumes; Disorders related to respiration-Asthma, Emphysema, Occupational respiratory disorders.

PMT – 03

Chapter-5: Morphology of Flowering Plants

- Morphology and modifications; Tissues; Anatomy and functions of different parts of flowering plants: Root, stem, leaf, inflorescence- cymose and recemose, flower, fruit and seed

Chapter-6: Anatomy of Flowering Plants

- Anatomy and functions of different tissues and tissue systems in dicots and monocots. Secondary growth.

Chapter-10: Cell Division: 6 Hours

- Cell division: Cell cycle, mitosis, meiosis and their significance.

Chapter-18: Body fluid and Circulation 2:6 Hours

- Body fluids and circulation: Composition of blood, blood groups, coagulation of blood; Composition of lymph and its function; Human circulatory system-Structure of human heart and blood vessels; Cardiac cycle, cardiac output, ECG, Double circulation; Regulation of cardiac activity; Disorders of circulatory system-Hypertension, Coronary artery disease, Angina pectoris, Heart failure.

Chapter-4: Reproductive health: 2 Hours

- Reproductive health: Need for reproductive health and prevention of sexually transmitted diseases (STD); Birth control-Need and Methods, Contraception and Medical Termination of Pregnancy (MTP); Amniocentesis; Infertility and assisted reproductive technologies – IVF, ZIFT, GIFT (Elementary idea for general awareness).

PMT – 04 + PMT -01 Syllabi

Chapter-11:

- Transport in plants: Movement of water, gases and nutrients; Cell to cell transport-Diffusion, facilitated diffusion, active transport; Plant – water relations – Imbibition, water potential, osmosis, plasmolysis; Long distance transport of water – Absorption, apoplast, symplast, transpiration pull, root pressure and guttation; Transpiration-Opening and closing of stomata; Uptake and translocation of mineral nutrients-Transport of food, phloem transport, Mass flow hypothesis; Diffusion of gases (brief mention).

Chapter-12: Mineral Nutrition

- Mineral nutrition: Essential minerals, macro and micronutrients and their role; Deficiency symptoms; Mineral toxicity; Elementary idea of Hydroponics as a method to study mineral nutrition; Nitrogen metabolism-Nitrogen cycle, biological nitrogen fixation.

Chapter-7: Evolution: 4 Hours

- Origin of life; Biological evolution and evidences for biological evolution from Paleontology, comparative anatomy, embryology and molecular evidence); Darwin's contribution, Modern Synthetic theory of Evolution; Mechanism of evolution-Variation (Mutation and Recombination) and Natural Selection with examples, types of natural selection; Gene flow and genetic drift; Hardy-Weinberg's principle; Adaptive Radiation; Human evolution.

Chapter-1: Reproduction in Organisms: 2 Hours

- Reproduction in organisms: Reproduction, a characteristic feature of all organisms for continuation of species; Modes of reproduction – Asexual and sexual; Asexual reproduction; Modes-Binary fission, sporulation, budding, gemmule, fragmentation; vegetative propagation in plants.

Chapter-19: Excretory Products and Elimination: 6 Hours

• Excretory products and their elimination: Modes of excretion ammonotelism, ureotelism, uricotelism; Human excretory system-structure and function; Urine formation, Osmoregulation; Regulation of kidney function-Renin-angiotensin, Atrial natriuretic Factor, ADH and Diabetes insipidus; Role of other organs in excretion; Disorders; Uraemia, Renal failure, Renal calculi, Nephritis; Dialysis and artificial kidney.

Chapter-20: Locomotion and movement: 2 Hours

• Locomotion and Movement: Types of movement- ciliary, flagellar, muscular; Skeletal muscle contractile proteins and muscle contraction; Skeletal system and its functions (To be dealt with the relevant practical of Practical syllabus); Joints; Disorders of muscular and skeletal system- Myasthenia gravis, Tetany, Muscular dystrophy, Arthritis, Osteoporosis, Gout

PMT – 05 + PMT – 02 Syllabi

Chapter-13: Photosynthesis in Higher Plants

• Photosynthesis: Photosynthesis as a means of Autotrophic nutrition; Site of photosynthesis take place; pigments involved in Photosynthesis (Elementary idea); Photochemical and biosynthetic phases of photosynthesis; Cyclic and non-cyclic and photophosphorylation; Chemiosmotic hypothesis; Photorespiration C₃ and C₄ pathways; Factors affecting photosynthesis.

Chapter-9: Strategies for Enhancement in Food Production

• Improvement in food production; Plant breeding, tissue culture, single cell protein, Biofortification; Apiculture and Animal husbandry.

Chapter-10: Microbes in Human Welfare

• Microbes in human welfare: In household food processing, industrial production, sewage treatment, energy generation and as

biocontrol agents and biofertilizers.

Chapter-5: Principles of Inheritance and Variation

- Heredity and variation: Mendelian Inheritance; Deviations from Mendelism- Incomplete dominance, Co-dominance, Multiple alleles and Inheritance of blood groups, Pleiotropy; Elementary idea of polygenic inheritance; Chromosome theory of inheritance; Chromosomes and genes; Sex determination-In humans, birds, honey bee; Linkage and crossing over; Sex linked inheritance- Haemophilia, Colour blindness; Mendelian disorders in humans Thalassaemia; Chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.

Chapter-21: Neural Control and Coordination: 8 Hours

- Neural control and coordination: Neuron and nerves; Nervous system in humans central nervous system, peripheral nervous system and visceral nervous system; Generation and conduction of nerve impulse; Reflex action; Sense organs; Elementary structure and function of eye and ear.

PMT – 06 + PMT - 03 Syllabi

Chapter-14: Cellular Respiration

- Respiration: Exchange gases; Cellular respiration-glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); Energy relations Number of ATP molecule generated; Amphibolic pathways; Respiratory quotient.

Chapter-15: Plant Growth and Development: 2 Hours

- Plant growth and development: Seed germination; Phases of Plant growth and plant growth rate; Conditions of growth; Differentiation, dedifferentiation and differentiation; Sequence of developmental process in a plant cell; Growth regulators-auxin, gibberellin, cytokinin, ethylene, ABA; Seed dormancy; Vernalisation; Photoperiodism.

Chapter-6: Molecular basis of inheritance: 10 Hours

- Molecular basis of Inheritance: Search for genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central dogma; Transcription, genetic code, translation; Gene expression and regulation Lac Operon; Genome and human genome project; DNA finger printing.

Chapter-22: Chemical coordination and regulation: 6 Hours

- Chemical coordination and regulation: Endocrine glands and hormones; Human endocrine system- Hypothalamus, Pituitary, Pineal, Thyroid, Parathyroid, Adrenal, Pancreas, Gonads; Mechanism of hormone action (Elementary Idea); Role of hormones as messengers and regulators, Hypo-and hyperactivity and related disorders (Common disorders e.g. Dwarfism, Acromegaly, Cretinism, goiter, exophthalmic goiter, diabetes, Addison's disease). (Imp: Diseases and disorders mentioned above to be dealt in brief.)

PMT – 07 + PMT -04 Syllabi

Chapter-2: Sexual Reproduction in flowering plants: 4 Hours

- Sexual reproduction in flowering plants: Flower structure; Development of male and female gametophytes; Pollination-types, agencies and examples; Outbreeding devices; Pollen-Pistil interaction; Double fertilization; Post fertilization events Development of endosperm and embryo, Development of seed and formation of fruit; Special modes-apomixis, parthenocarpy, polyembryony; Significance of seed and fruit formation.

Chapter-13: Organisms and Populations

- Organisms and environment: Habitat and niche; Population and ecological adaptations; Population interactions-mutualism,

competition, predation, parasitism; Population attributes-growth, birthrate and death rate, age distribution

Chapter-14: Ecosystem

- Ecosystem: Patterns, components; productivity and decomposition; Energy flow; Pyramids of number, biomass, energy; Nutrient cycling (carbon and phosphorous); Ecological succession; Ecological Services-Carbon fixation, pollination, oxygen release.

Chapter-15: Biodiversity and Conservation

- Biodiversity and its conservation: Concept of Biodiversity; Patterns of Biodiversity; Importance of Biodiversity; Loss of Biodiversity; Biodiversity conservation; Hotspots, endangered organisms, extinction, Red Data Book, biosphere reserves, National parks and sanctuaries.

Chapter-16: Environmental Issues

- Environmental issues: Air pollution and its control; Water pollution and its control; Agrochemicals and their effects; Solid waste management; radioactive waste management; Greenhouse effect and global warning; Ozone depletion; Deforestation; Any three case studies as success stories addressing environmental issues.

Chapter-11: Biotechnology - Principles and Processes

- Principles and process of Biotechnology: Genetic engineering (Recombinant DNA technology).

Chapter-12: Biotechnology and its Application

- Application of Biotechnology in health and agriculture: Human insulin and vaccine production, gene therapy; Genetically modified organisms-Bt crops; Transgenic Animals; Biosafety issues- Biopiracy and patents.

Chapter-8: Human Health and Diseases

• Health and Disease; Pathogens; parasites causing human diseases (Malaria, Filariasis, Ascariasis. Typhoid, Pneumonia, common cold, amoebiasis, ring worm); Basic concepts of immunology vaccines; Cancer, HIV and AIDS; Adolescence

Chapter-3: Human Reproduction: 4 Hours

• Human Reproduction: Male and female reproductive systems; Microscopic anatomy of testis and ovary; Gametogenesis-spermatogenesis & oogenesis; Menstrual cycle; Fertilisation, embryo development up to blastocyst formation, implantation; Pregnancy and placenta formation(Elementary idea); Parturition (Elementary idea); Lactation (Elementary idea).

MATHEMATICS

PMT-01

UNIT I: SETS AND FUNCTIONS (XI)

1. Sets

Sets and their representations. Empty set. Finite and Infinite sets. Equal sets. Subsets. Subsets of the set of real numbers especially intervals (with notations). Power set. Universal set. Venn diagrams. Union and intersection of sets. Difference of sets. Complement of a set, Properties of Complement sets.

2. Relations and Functions

Ordered pairs, Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the reals with itself (up to $R \times R \times R$). Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special kind of relation from one set to another. Pictorial representation of a function, domain, co-domain and range of a function. Real valued function of the real variable, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum and greatest integer functions with their

graphs. Sum, difference, product and quotients of functions.

3. Trigonometric Functions

Positive and negative angles. Measuring angles in radians and in degrees and conversion from one measure to another.

Definition of trigonometric functions with the help of unit circle.

Truth of the identity $\sin^2 x + \cos^2 x = 1$, for all x . Signs of trigonometric functions and sketch of their graphs. Expressing

$\sin(x + y)$ and $\cos(x + y)$ in terms of $\sin x$, $\sin y$, $\cos x$ and $\cos y$.

Deducing the identities like following:

$$\tan(x \pm y) = \frac{\tan x \pm \tan y}{1 \mp \tan x \times \tan y}, \cot(x \pm y) = \frac{\cot x \cot y \mp 1}{\cot y \pm \cot x}$$

$$\sin x + \sin y = 2 \sin \frac{x+y}{2} \cdot \cos \frac{x-y}{2}, \cos x + \cos y = 2 \cos \frac{x+y}{2} \cos \frac{x-y}{2}$$

$$\sin x - \sin y = 2 \cos \frac{x+y}{2} \cdot \sin \frac{x-y}{2}, \cos x - \cos y = -2 \sin \frac{x+y}{2} \sin \frac{x-y}{2}$$

Identities related to $\sin 2x$, $\cos 2x$, $\tan 2x$, $\sin 3x$, $\cos 3x$ and $\tan 3x$.

General solution of trigonometric equations of the type Proofs and simple applications of sine and cosine formulae.

2. Complex Numbers and Quadratic Equations

Need for complex numbers, especially -1 , to be motivated by inability to solve every quadratic equation. Brief description of algebraic properties of complex numbers. Argand plane and polar representation of complex numbers. Statement of Fundamental Theorem of Algebra, solution of quadratic equations in the complex number system, Square-root of a Complex number.

PMT-02

UNIT II: ALGEBRA (XI)

3. Linear Inequalities

Linear inequalities, Algebraic solutions of linear inequalities in one variable and their representation on the number line.

Graphical solution of linear inequalities in two variables.

Solution of system of linear inequalities in two variables - graphically.

4. Permutations and Combinations

Fundamental principle of counting. Factorial n . Permutations and combinations derivation of formulae and their connections, simple applications.

5. Binomial Theorem

History, statement and proof of the binomial theorem for positive integral indices. Pascal's triangle, general and middle term in binomial expansion, simple applications

UNIT III: COORDINATE GEOMETRY (XI)

1. Straight Lines

Brief recall of 2-D from earlier classes, shifting of origin. Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axes, point-slope form, slope-intercept form, two-point form, intercepts form and normal form. General equation of a line.

PMT – 03

UNIT II: ALGEBRA (XI)

6. Sequence and Series

Sequence and Series. Arithmetic Progression (A.P.), Arithmetic Mean (A.M.), Geometric Progression (G.P.), general term of a G.P., sum of n terms of a G.P. Arithmetic and geometric series, infinite G.P. and its sum, geometric mean (G.M.). Relation between A.M. and G.M. Sum to n terms of the special series

2. Conic Sections

Sections of a cone: Circles, ellipse, parabola, hyperbola, a point, a straight line and pair of intersecting lines as a degenerated case of a conic section. Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle.

UNIT IV: CALCULUS (XI)

Limits and Derivatives

Derivative introduced as rate of change both as that of distance function

and geometrically, intuitive idea of limit $\lim_{x \rightarrow 0} \frac{\log_e(1+x)}{x}$, $\lim_{x \rightarrow 0} \frac{e^x - 1}{x}$ Definition of derivative, relate it to slope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions

PMT– 04

UNIT II: ALGEBRA (XI)

1. Principle of Mathematical Induction

Process of the proof by induction, motivating the application of the method by looking at natural numbers as the least inductive subset of real numbers. The principle of mathematical induction and simple applications.

UNIT I: RELATIONS AND FUNCTIONS (XII)

1. Relations and Functions

Types of relations: Reflexive, symmetric, transitive and equivalence relations. One to one and onto functions, composite functions, inverse of a function. Binary operations.

2. Inverse Trigonometric Functions

Definition, range, domain, principal value branches. Graphs of inverse trigonometric functions.

Elementary properties of inverse trigonometric functions.

PMT– 05

UNIT III: COORDINATE GEOMETRY (XI)

3. Introduction to Three-dimensional Geometry

Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points and section formula.

UNIT V: MATHEMATICAL REASONING (XI)

Mathematically acceptable statements. Connecting words/phrases - consolidating the understanding of “if and only if (necessary and sufficient) condition”, “implies”, “and/or”,

“implied by”, “and”, “or”, “there exists” and their use through variety of examples related to real life and Mathematics. Validating the statements involving the connecting words - difference between contradiction, converse and contrapositive.

UNIT II: ALGEBRA (XII)

1. Matrices

Concept, notation, order, equality, types of matrices, zero matrix, transpose of a matrix, symmetric and skew symmetric matrices. Addition, multiplication and scalar multiplication of matrices, simple properties of addition, multiplication and scalar multiplication. Non-commutativity of multiplication of matrices and existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order 2). Concept of elementary row and column operations. Invertible matrices and proof of the uniqueness of inverse, if it exists; (Here all matrices will have real entries).

UNIT IV: VECTORS AND THREE-DIMENSIONAL GEOMETRY (XII)

Unit V: Linear Programming

Introduction, related terminology such as constraints, objective function, optimization, different types of linear programming (L.P.) problems, mathematical formulation of L.P. problems, graphical method of solution for problems in two variables, feasible and infeasible regions, feasible and infeasible solutions, optimal feasible solutions (up to three non-trivial constraints).

Unit VI: Probability (XII)

Multiplications theorem on probability. Conditional probability, independent events, total probability, Baye’s theorem. Random variable and its probability distribution, mean and variance of haphazard variable. Repeated independent (Bernoulli) trials and Binomial distribution.

UNIT VI: STATISTICS AND PROBABILITY (XI)

1. Statistics

Measure of dispersion; mean deviation, variance and standard deviation of ungrouped/grouped data. Analysis of frequency distributions with equal means but different variances.

2. Probability

Random experiments: outcomes, sample spaces (set representation). Events: Occurrence of events, 'not', 'and' & 'or' events, exhaustive events, mutually exclusive events. Axiomatic (set theoretic) probability, connections with the theories of earlier classes. Probability of an event, probability of 'not', 'and', & 'or' events.

PMT– 06

UNIT II: ALGEBRA (XII)

2. Determinants

Determinant of a square matrix (up to 3×3 matrices), properties of determinants, minors, cofactors and applications of determinants in finding the area of a triangle. Adjoint and inverse of a square matrix. Consistency, inconsistency and number of solutions of system of linear equations by examples, solving system of linear equations in two or three variables (having unique solution) using inverse of a matrix.

UNIT III: CALCULUS (XII)

1. Continuity and Differentiability

Continuity and differentiability, derivative of composite functions, chain rule, derivatives of inverse trigonometric functions, derivative of implicit function. Concepts of exponential, logarithmic functions.

Derivatives of $\log x$ and e^x . Logarithmic differentiation. Derivative of functions expressed in parametric forms. Second order derivatives. Rolle's and Lagrange's Mean Value Theorems (without proof) and their geometric interpretations.

3. Integrals

Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, only simple integrals of the type – to be evaluated.

$$\int \frac{dx}{x^2 \pm a^2}, \int \frac{dx}{\sqrt{x^2 \pm a^2}}, \int \frac{dx}{\sqrt{a^2 - x^2}}, \int \frac{dx}{ax^2 + bx + c}, \int \frac{dx}{\sqrt{ax^2 + bx + c}},$$

$$\int \frac{(px + q)}{ax^2 + bx + c} dx, \int \frac{(px + q)}{\sqrt{ax^2 + bx + c}} dx, \int \sqrt{a^2 \pm x^2} dx \text{ and } \int \sqrt{x^2 - a^2} dx,$$

$$\int \sqrt{ax^2 + bx + c} dx \text{ and } \int (px + q)\sqrt{ax^2 + bx + c} dx$$

Definite integrals as a limit of a sum. Fundamental Theorem of Calculus (without proof). Basic properties of definite integrals and evaluation of definite integrals.

PMT– 07

UNIT III: CALCULUS (XII)

2. Applications of Derivatives

Applications of derivatives: Rate of change, increasing/decreasing functions, tangents and normal's, approximation, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable tool). Simple problems (that illustrate basic principles and understanding of the subject as well as real-life situations).

UNIT III: CALCULUS (XII)

3. Integrals

Definite integrals as a limit of a sum. Fundamental Theorem of Calculus (without proof). Basic properties of definite integrals and evaluation of definite integrals.

UNIT III: CALCULUS (XII)

4. Applications of the Integrals

Applications in finding the area under simple curves, especially lines, arcs of circles/parabolas/ellipses (in standard form only), area between the two above said curves (the region should be clearly identifiable).

5. Differential Equations

Definition, order and degree, general and particular solutions of a differential equation. Formation of differential equation whose general solution is given. Solution of differential equations by method of separation of variables, homogeneous differential equations of first order and first degree. Solutions

$$\frac{dy}{dx} + Py = Q, \text{ where P and Q are functions of } x \text{ or constant}$$

$$\frac{dx}{dy} + Px = Q, \text{ where P and Q are functions of } y \text{ or constant}$$

UNIT IV: **VECTORS AND THREE-DIMENSIONAL GEOMETRY (XII)**

1. Vectors

Vectors and scalars, magnitude and direction of a vector. Direction cosines/ratios of vectors. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio. Scalar (dot) product of vectors, projection of a vector on a line. Vector (cross) product of vectors, scalar triple product.

2. Three-dimensional Geometry

Direction cosines/ratios of a line joining two points. Cartesian and vector equation of a line, coplanar and skew lines, shortest distance between two lines. Cartesian and vector equation of a plane. Angle between (i) two lines, (ii) two planes, (iii) a line and a plane. Distance of a point from a plane.

Student Report Card

Name....., Batch.....

Date of Admission...../...../.....,

Mode of Class: Residential / Nonresidential

Monthly Attendance Report

Month	Subject	Attendance	Sing of class coordinator
August, 22	Physics		
	Chemistry		
	Biology		
September, 22	Physics		
	Chemistry		
	Biology		
October , 22	Physics		
	Chemistry		
	Biology		
November, 22	Physics		
	Chemistry		
	Biology		
December, 22	Physics		
	Chemistry		
	Biology		

January, 23	Physics		
	Chemistry		
	Biology		
February, 23	Physics		
	Chemistry		
	Biology		
March, 23	Physics		
	Chemistry		
	Biology		
April, 23	Physics		
	Chemistry		
	Biology		
May, 23	Physics		
	Chemistry		
	Biology		
June, 23	Physics		
	Chemistry		
	Biology		
July, 23	Physics		
	Chemistry		
	Biology		

PLATFORM MAJOR TEST REPORT

DATE	TEST NO	PHY	CHEM	BIO	TOTAL	SING

PLATFORM MOCK TEST REPORT

DATE	TEST NO	PHY	CHEM	BIO	TOTAL	SING

NOTE