

# Course Planner for LEADER Batch (Class 13th Student)

## PHYSICS COURSE SCHEDULE

### NEET Yearlong Physics for Class 13th of NEET 2021 by MK Sir

CHAPTER NAME	NO. OF LECTURES	CONTENT OF CHAPTER
<b>Error + Vectors (4)</b>	1	Scaler and Vector , Laws of Vector , Vector Addition - Triangular Law , parallelogram law , polygon law
	2	Product and Division of Scaler with vector , unit Vector , Component of Vectors in X-Y-Z Direction , Product of Vectors : Double Product & Triple Product
	3	Error Analysis - Systematic and Random Error , accuracy and Precision , Error in Measurement , Relative and Absolute Error , Significant Error
	4	DISCUSSION
<b>1 D Motion (4)</b>	1	position Vector , Velocity , Speed and Acceleration , Avg. and instantaneous Value , Distance and Displacement , tangential & Centripetal acceleration
	2	ST Line Motion & Curvilinear Motion ,Constant acceleration and Equation of Motion , Variable Acceleration
	3	Graph s-t , v-t ,a-t , s-v etc . conversion , area and slope of Graph , Motion under gravity
	4	DISCUSSION
<b>Projectile (4)</b>	1	Component Along Horizontal - Vertical , Time of Flight and Range of Projectile , Maximum Angle for Maximum Range , Hieght and Time ,Complementary angle of Same Range
	2	Radius of Curvature ,Ground to Ground ,Ground to Space , Space to Ground Projectiles , Equation of Trajectories
	3	Projectile on Inclined plane
	4	Discussion
<b>Circular kinematics (2)</b>	1	Angular Displacment , Angular Velocity and Angular Acceleration , Uniform and non uniform circular motion
	2	Equation of Motion under Uniform circular Motion + Discussion
<b>Relative Motion (4)</b>	1	Relative Motion in 1 D , Constraint Motion , River Man Situation
	2	Rain- Man Situation , Wind Aeroplane Situation

	3	General Example of Relative Motion between Projectiles
	4	Discussion
<b>Newton Law's of Motion + Friction (7)</b>	1	Type of Forces , external and internal forces , Concept of Momentum , Newtons Law , Free body diagram , equilibrium of forces
	2	conservation of momentum , Net Force and impulse ,
	3	Interial and Non- Interial Frame of reference + Pseudo Force
	4	Static and Kinetic Friction , angle of Friction , Friction on incline , angle of repose
	5	Multiple Friction , Rolling Friction and Lubrication
	6	Spring balance , Weighing Machine , Spring contraction , Pulley and its constraint
	7	Virtual Work + Discussion
<b>Circular Dynamics (3)</b>	1	Centripital Forces , Conical Pendulum , Rotating Particle in spherical shell , cylindrical shell ,
	2	bending of cyclist , banking of roads and Role of Friction , Limiting friction in spherical Shell
	3	Discussion
<b>WORK , POWER AND ENERGY(6)</b>	1	work of constant forces . Central and non central forces , Conservative Forces and Potential energy
	2	Work -Energy Theorm , Work Done on inclined plane
	3	Concept of Power , instaneous and Avg. Conservation of mechanical energy
	4	Vertical Circular Motion , String & Rod Oscillation, Slacking
	5	Condition of Slacking Via trajectory , Complete Circular Motion
	6	Discussion

<b>Centre of Mass and Collision (6)</b>	1	Defination & Calculation of Discrete and Continous System , COM of Semi-Circular Ring , Half Ring , Hemi-Spherical Shell , Conical Shell Solid Cone ,Triangular Lamina and other Bodies , COM for 2 bodies , cases of cavity
	2	Momentum of System , Accelaration of COM ,Conservation of Momentum and Retainment of COM Cases
	3	System of Variable Mass + Discussion
	4	Impluse and Impule relation with change of Momentum , Coefficient of Restitution , Head on Collision and Oblique Collision
	5	Elastic and Non Elastic Collision & Centric and ecentric collision
	6	Discussion
<b>ROTATIONAL MOTION (10)</b>	1	Introduction , Moment of interia , parallel and Perpendicular axis theorm
	2	MOI Calculation for complex cases including Cavity , Radius of Gyration
	3	Torque and its relation with angular accelaration , cases of zero torque by a force
	4	Rotational Equilibirum , Hinge reaction on rigid body on release
	5	Concept of Pure Rotation , angular Momentum and relation with impulse (Newtons Law of Rotation )
	6	Angular Momentum and Conservative Cases , Rotational Kinetic energy , energy calculation and hinge reaction
	7	Combinatin of rotational + translation Motion , Slipping , Pure Rolling ,Mechanical energy
	8	Conservation in Pure Rolling , Pure rolling in inclined Plane
	9	IAOR and its centre , Locating Centre using IAOR
	10	Discussion and Problems
	1	Equation of SHM , Velocity and Accelaration in SHM , Energy of SHM , Time Period and Angular Frequency in SHM
	2	Two Block system & Combination of Springs in SHM

<b>SIMPLE HARMONIC MOTION(6)</b>	3	Angular SHM
	4	Simple Pendulum , Compound pendulum , Torsional Pendulum
	5	Combination of two or More SHM + Discussion
	6	Discussion
<b>ELASTICITY + CALORIMETRY + THERMAL EXPANSION (6)</b>	1	Elastic Body , Restoring Forces Types of Stress and Strain , Stress -strain Graph , Hookes Law , Measure of Elasticity
	2	Elastic PE , Expansion by Self Weight , Rotation , Temp. and Impurity effect on Elasticity + Discussion
	3	Mechanical Equivalent of heat , Specific Heat Molar heat Capacity Heat/ Thermal Capacity Latent heat ,
	4	Principal of Calorimetry , water equivalent of calorimeter ,sublimation , condensation + discussion .
	5	Temperature and scales , PE and T graph ,Thermal Expansion /Contraction of $\alpha$ , $\beta$ , $\gamma$ . , Application of Bi-Metallic Strips , Cavity , Time loss /Gain by clock
	6	Error in scale reading , apparent expansion of liquid ,anomalous expansion of water + Discussion
<b>KTG (3)</b>	1	Solid ,Liquid , Gas . NTP and STP . Concept of Ideal Gas ,postulates of ideal gas , Ideal gas Equation , Boyle's Law , Charle's law , Gay - Lussac Law ,Avogadro Law .
	2	Degree of Freedom , Maxwell's Law of equipartition of energy , Internal energy , Molecular KE , Molar KE , Energy Distribution .
	3	Maxwell Law of Velocity distribution , Avg. Velocity , RMS Velocity , Mean Speed .mean Free Path + Discussion
<b>THERMODYNAMICS (6)</b>	1	Thermodynamic system ,Surrounding , closed , open , isolated system . $n$ , T, P as system variables ,state of system .
	2	Zeroth law , Thermal Equilibrium ,internal energy , Process - Isothermal , isobaric , Adiabatic ploytropic , equation and graph of process .
	3	Indicator Diagrams , sign Conventions ,work done by gas , work done in different process , heat loss in different process
	4	Internal Energy as state function , First law of thermodynamics ,significance and relations with specific heat Constants ,Slope relations , Free expansion General Expansion , Mixtrue of equivalent specific heat constants , cyclic Process , Work Done
	5	Heat Engine , Efficiency ,Carnot Cycle and its efficiency , carnot theorm , Second Law of thermodynamics , , Kelvin-Planck statement , clausius Statement

	6	Refrigerator , Coefficient of performance (COP)= Heat extracted from cold body/ WD on Refrigerator , (COP) For Carnot reversible Refrigerator
<b>HEAT TRANSFER (4)</b>	1	Modes , Law of Conduction , temp. Gradient . Thermal Resistance and different cases of Series and parallel Combination , Growth of ice , heat current for spherical and cylindrical flow , Questions on Wheatstone and Symmetry .
	2	Radiation , absorptive power , emissive Power and their spectral definition , emissivity ,Black body , Prevost Theory of exchange , kirchhof's Law and application
	3	stefan's law and Newtons law of Cooling , Distribution of black body and Wein's Law . Solar Constant and Sun Temp.
	4	Spectral energy + Discussion
<b>ELECTROSTATICS (10)</b>	1	Charge - Definition and its properties , Coulombs law , Effect of Medium , Electric Field ,Electric field Lines .
	2	Electric field , Properties of electric field , Electric Field Due to point charge , arc , ring , line charge, disc , sheet, E-x Graph
	3	Motion of Charge particle in Electric field , Definition of Flux , Gauss Law , Flux by Gauss law .
	4	Electric Field Due to spherical shell , sphere , cylindrical shell , cylinder , thick sheet , Electric Field Within Cavity , Electric field for Variable Charge density
	5	Cond. , charge and Electric Field within Conductor , charge distribution on concentric metallic Shells and Parallel metallic plate , Potential Energy for two and multiple charge system
	6	Electric Potential and Potential Difference , Relation between Electric Field and potential difference , Electric Potential of Point Charge , ring , line charge , spherical shell , solid sphere
	7	Relation between potential difference and Work Done, Equipotential Surface , charge sharing and earthing of conductor , Self energy .
	8	electric dipole , dipole moment , electric potential and electric field due to electric dipole , dipole in electric field , torque,
	9	SHM of Dipole , point charge , dipole , dipole -dipole interaction , Properties of Conductor ,electrostatic pressure , Free BoundCharges , Conductor as equipotential surface
	10	Shielding in conductor + DISCUSSION
<b>GRAVITATION (4)</b>	1	Gravitational Force Field , Potential , Potential energy and comparison with electrostatic +
	2	Definition of 'g' and its variation with height , depth , rotation and shape , Binding energy , escape velocity
	3	Keplers law , Geo- Stationary and Near Earth Satellite , Long pendulum , SHM if particle in tunnel ,

	4	DISCUSSION
<b>CURRENT ELECTRICITY (8)</b>	1	Current , Drift Velocity ,mobility and relation between Current and drift velocity , Current density , Ohm's law .
	2	Conductivity conductance , ohmic /non ohmic resistance , Resistance in different cases ,Equivalent Resistance , Variation of Resistivity and Conductance with tempeture
	3	Battery , EMF , Equivalent of Circuit elements ,Kirchoff's law
	4	Series and parallel combination of resistance and batteries
	5	Wheat stone bridge , symmetry , PT. Potential ,Nodal analysis , More examples on finding equivalent resistance and Resistance for Cubical frame .
	6	Unbalanced wheatstone bridge , symmetric and non symmetric combinations , Power of resistance , battery , parallel connection in home
	7	Max. Power Transfer theorm (MPTT) , Fuse wire , Galvanometer , ammeter , Voltmeter and their Conversion
	8	Meterbridge + Potentiometer + PO Box + Discussion
<b>CAPACITOR (5)</b>	1	capacitor , capacitance , type of capacitor , capacitance of spherical , cylinder , parallel plate and other capacitor
	2	Parallel plate - Equal and unequal charge case , steady state , charging , Energy of capacitor , force between plates , combinsation of capacitor
	3	Heat loss , dielectric partial and complete , polarization , induced charges , Equivalent Capacitance
	4	Effect of charge in Capacitance , Charing and discharging of capacitor , their equivalent and Equivalent time and battery efficiency
	5	Earthing cases + Discussion
	1	Production of Magnetic Field , Biot Savart law , magnetic Field Lines ,
	2	Magnetic Field Due to St. Wire , Loop ,Arc , sheet , Cylinder trough , solenoid
	3	Magnetic Field Lines , Magnetic Field Due to Moving Charge , E/B Value . Ampere's law , Finding Line Integration of magnetic field
	4	Magnetic Field inside and Outside wires ,Magnetic Field Within Cavity , Magnetic field between sheets , solenoid , Toroid .

<b>MAGNETIC EFFECT OF CURRENT (10)</b>	5	Magnetic Force , Motion in Uniform magnetic field , Circular and Helical Motion
	6	Lorentz Force , Motion under Electric field and Magnetic field , Velocity Selector ,mass spectrometer , force on wire
	7	Effective length in uniform Magnetic field , Force Between parallel wires , Magnetic dipoles , field Lines
	8	Dipole moment ,M of moving charge , field on dipole ,Torque , energy and force on dipole due to Magnetic field
	9	MCG ,Current /Voltage Sensitivity ,Discussion
	10	Discussion
<b>MAGNETISM (4)</b>	1	Earth magnetism , Meridian , Dip angle , dip circle , app. Dip , Vibrational Magnetometer , Mag. Shielding
	2	Meissener effect , Magnetic material and Microscopic explanation
	3	Magnetization variable , Curie law , curie-weiss law , Curie temp .
	4	Hysterises , B Vs H Graph , coercivity , retentivity , Losses + Diccusion
<b>EMI (10)</b>	1	Translational and Rotational of conducting rod in uniform Magnetic field , Accelarating and rotating conducting rod in absense of Magentic field
	2	Magnetic Flux and Faraday Law and Lenz law , Induced Current
	3	Energy Loss , In-out of Magnetic field by a closed body , Horizontal - Vertical Rails
	4	Cases including C , terminal velocity , rotating disc , Cases having Induced EMF and Battery
	5	Disc Rotation about diameter , AC generator , time variation of Mangetic field , Induced EMF inside outside
	6	Finding Potential difference and Induced EMF b/w points , charges flow , impluse , Magnetic Field varition .
	7	Mutual Induction Law , Conentric Coils , Co-axial Solenoid , Self induction Law , Inductor
	8	Inductance , equivalent Inductance of solenoid , toroid , Inductor Combination , Magnetic Energy Density , Growth /fall of current in LR Circuit

	9	LR Circuit , L-C Oscillations , Equivalent time calculation ,comparision with spring - block
	10	Discussion
<b>AC (4)</b>	1	AC Current , Frequency , avg ,RMS ,peak .AC Circuit , Phase angle , Power and power factor , Phasor diagram , resistance , X ,Z , rms value of V and Instantneous value of V across elements .
	2	AC Circuit , R only , L only , C only . Series Circuit : R-L ,L-C , R-C , L-C-R Circuit , resonance and Circuit analysis .
	3	Quality factor ,half power frequency , Parallel AC Circuit , Conductance , Susceptance and admittance
	4	Choke Coil , Transformer + Discussion
<b>PHOTOMETRY + PEE(4)</b>	1	Photon , Power ,intensity , force on beam & Examples .
	2	De-broglie wavelength , matter waves , quantization , particle in a box , bohr Model , Quantization & examples
	3	Photo - electric effect , hertz , hallwachs , einstein explanation , Isolated sphere and PEE Experiment ,stopping potential
	4	I-V Graph and effect of intensity and frequency + Discussion
<b>ATOMIC + X RAYS (3)</b>	1	models of Atom , Bohr Model and equations , V, r ,E dependancy on n and Z . Modified Bohr Model
	2	Excitation - De- excitation energy levels , series , rydberg equation , Recoil and Series Energy , atomic Collision , Motion of nucleus ,failure of Bohr model ,discussion
	3	X rays + Examples + Discussion
<b>NUCLEAR + RADIOACTIVITY (3)</b>	1	Nucleons , Isotope , isotone , isobar , binding energy and mass defect , Nuclear Forces , BE/A , Stability , Fission ,Fusion
	2	BE/A Graph , Nuclear reaction , Q value , Nuclear Decays , alpha, beta, gamma Decay
	3	Activity , law of radioactivity , Half Time ,Avg. Time , decay constant , soddy and Fajan's Rule Series , arallel disintegration , Equivalent decay constant
	1	Reflection ,Laws of reflection vector Law , Plane mirror , Plane mirror deviation , Field of View , object - image velocity, no. of images
	2	Spherical Mirror - Concave /convex , focal length , mirror formula , newtons formula , object - image speed , u- v Graph



<b>RAY OPTICS (12)</b>	3	Refraction ,Law of Rrefraction , Vector Law , Refractive index , Refraction in multiple parallel mediums , Rectangular Slab , lateral shift	
	4	shifting by slab , TIR and critical angle , Graph b/w deviation and angle of incidence .	
	5	Circle of illuminance, optical fibre , Mirage , Looming + Examples	
	6	Prism , graph b/w deviation and angle of incidence , No emergence prism , $i'=0$ , small angled prism	
	7	Cauchy 's Formula , Dispersion , Dispersive Power , Prism Combination , achromatism , Spherical refraction , formula F1 and F2 .	
	8	Spherical Refraction examples , Lens Formula , Magnification , obj-image Velocity , cutting -splitting	
	9	Lens Combination , power ,silvering of lens , Displacement Method , lens Defect , Achromatic combination	
	10	Simple Microscope , Magifying power , Compound Microscope .	
	11	Astronomical telescope , Resolving power and comparision ,lens cameras and Focal length , eye defects , myopia , hypermetropia , presbyopia , astigmatism	
	12	Discussion	
	<b>STRING WAVE (4)</b>	1	Equation of Wave , particle Velocity and accelaration , Speed of transverse waves on string ,energy in waves
		2	Superpostion , Principal interference of waves
3		reflection and transmission between 2 strings	
4		Equation of Standing Waves ( Stationary Wave ) , Stationary wave in String , vibration in sttring wave , Sonometer Wire	
<b>SOUND WAVE(6)</b>	1	Equation of Pressure Wave , Velocty , Newton's and laplace Formula , Loudness and Intensity , energy in Sound Waves	
	2	Interference of waves ,reflection and Refraction	
	3	Standing wave ( Organ pipe ) , resonance Tube , Quinck's Tube , Kund's Tube	
	4	Beats , Doppler's Effect ( Sound Wave )	

	5	Complete Wave Discussion
	6	Complete Wave Discussion
<b>WAVE OPTICS (4)</b>	1	Huygens hypothesis , wave front , secondary wavelets , laws of reflection /refraction , failure
	2	YDSE , Intensity , Variation on screen , no. of maxima & minima on screen , Optical path , slabs on slits
	3	bi and multi chromatic , white light , Medium change , screen movement , Multi slits , shape of fringes , lloyd's Mirror
	4	Thin Film interference , Newtons Ring + Discussion
<b>POLARIZATION + DIFFRACTION</b>	1	Polarization , polaroid , malus and Brewster Law , Scattering , Diffraction , fresnel/Fraunhofer diffraction , slit/Circular Hole , resolution
<b>EM WAVES</b>	1	Maxwell's Displacement current and Ampere's law failure , hertz Experiment , wave Eqn , Poynting vector , Specturm of EM Waves
<b>FLUID STATICS (6)</b>	1	Ideal Fluid - Density , Relative density , specific gravity , density of mixture , no shearing stress and shape of free surface , Pressure in Uniformly accelarted ( Horizontally and Vertically ) , and Rotating systems
	2	Closed Acceleration container , spilling liquid in rotating cylindrical container and accelerating container , U tube , Vertical ring , Other Examples Rotating and accelerated U tube
	3	Force of Liquid on Container Base and Side walls .Force on surface , centre of force and other force examples .
	4	Pascals's Principal ,
	5	Archimedes Princial , Buoyant Force , Centre of Buoyancy , Floating Stability in Floating .
	6	Discussion
<b>FLUID DYNAMICS (5)</b>	1	Ideal Fluid , Steady and turbulent flow , Streamlime flow ,Equation of Contiunity .
	2	Bernoullie's Equations ,Energy of liquid , PE ,KE Pressure energy
	3	Application of Bernoullie's Principal : Magnus effect , helicopter ,aeroplane , atomiser , venturimeter .
	4	Static and Dynamic pressure point , pitot tube , siphon , velocity of efflux , Toricelli's theorm ,

	5	Force on container + Discussion
<b>SURFACE TENSION + VISCOCITY (4)</b>	1	<b>SURFACE TENSION :</b> Surface tension , and Cohensive Forces , Soluble impurity , partially soluble impurity ,Contamination , Electrification , Surface tension Force , Surface energy ,
	2	excess pressure , angle on contact , effect of impurity on T , Capilliray tube , and Liquid rise in capillary tube , Liquid between two plates
	3	<b>VISCOCITY :</b> Viscous Force , its unit in SI and CGS , Viscous Flow in Steady state in cylinder , Parabolic Distance of velocity , Poiseuille equation ,Flow resistance
	4	Terminal Velocity of drop , Stoke's law ,Reynolds No. ,coefficient of viscocity for liquid , gases .
<b>ELECTRONIC DEVICES(4)</b>	1	Concept of Holes in semi-conductor , Intrinsic ,extrinsic ,doping , N type ,P type , Mass action law , P-N Junction ,diffusioin , drift current , potential barrier , depletion layer , Diode- Forward & Reversed Biased
	2	Zener and avalanche breakdown , application of diode LED ,photodiode ,solarcell ,Zener diode ,rectifier - Full wave , half wave ,Bridge recitifier
	3	Transistor , E,B,C, npn ,pnp . Region of Working , Common base , Common emiiter Common collector , input output charateristics
	4	Logic gates : OR ,AND, NOT , NOR,NAND , XOR, XNOR Gate . Boolean algebra ,truth table , Elec. Analogue and Circuit diagram
<b>COMMUNICATION (2)</b>	1	Communication and Element of Communication System , types , basic definitions tranducer , noise , signal ,attenuation , Prop. Of EM waves , Ground ,Sky ,space Communication
	2	Modulation : AM ,FM ,PM , Modulation Index , Band Width Sq.law Device ,Band Pass Filter , Demodulation ,IP Stage , Envelope Detector , Cmax.

## CHEMISTRY COURSE SCHEDULE

### NEET Yearlong Physical & Inorganic Chemistry for Class 13th of NEET 2021 by PS Sir

CHAPTER NAME	NO. OF LECTURES	CONTENT OF CHAPTER
<b>Mole Concept-14</b>	1	introduction to mole concept, atomic mass & relative atomic mass, mole concept & calculation
	2	calculation of no. of particles, calculation of moles from vol. at STP, calculation of electrons, protons & neutrons
	3	calculation of change, average atomic mass of isotopic mixture, average molar mass of mixture
	4	vapour density of gaseous mixture, percentage composition, law of conservation of mass
	5	laws of chemical combination, molecular and empirical formula
	6	discussion of DPP-2 and calculation of empirical formula for combustion of organic compounds
	7	stoichiometry and stoichiometric calculation, concept of limiting reagent
	8	percentage yield, percentage purity and calculation
	9	Mixture Analysis, POAC (Principle of Atom conservation), and Series or Sequential Reaction
	10	Illustration on Series or Sequential Reactions, When two or more Elements Combine to form or more Products Simultaneously
	11	Concentration Terms and Their Interconversion
	12	Application of Molarity, Molarity of dilution, Molarity of mixing
	13	Volume Strength of H <sub>2</sub> O <sub>2</sub> , Miscellaneous Questions
	14	eudiometry and its application
<b>Atomic Structure -12</b>	1	Introduction, Rutherford's $\alpha$ Particle Scattering Experiment, Drawback of Rutherford's Model
	2	Electromagnetic Radiation, Planck's Quantum Theory and its Application
	3	photoelectric effect, black body radiation
	4	Bohr's atomic model, radius of electron in nth Bohr orbit, velocity, time period & frequency of electron in nth Bohr orbit
	5	spectrum & its types, hydrogen spectrum, different series in hydrogen spectrum
	6	energy of electron in nth Bohr orbit, energy of different energy level, ionisation energy

	7	calculation of number spectral lines,drawbacks of bohr's model,De-Broglie concept
	8	association of de-broglie concept with bohr's model,heisenberg's uncertainty principle,calculation of uncertainty in wavelength from uncertainty in position ,quantum numbers
	9	Magnetic Quantum Number, Orbital
	10	Pauli's Exclusion Principle, Hund's Rule of Maximum Multiplicity, Writing Electron Configurations,Exceptional Electronic Configurations Stability of Half Filled & Full Filled Configurations, Magnetic Moment
	11	Schrodinger wave equation,radial and angular nodes,graphs of wave functions & orbitals
	12	Radial probability density function,illustrationRadial probability density function,illustration
<b>Gaseous State-9</b>	1	introduction, Gas laws & Graphs, Ideal gas Equation
	2	Types of Vessel,Manometer and Barometer,Dalton's Law and its Application
	3	dalton's law & its application,effusion & diffusion
	4	faulty barometer,effusion,diffusion & its applications,kinetic theory of gases
	5	kinetic gas equation,types of molecular speeds,K.E. of gas,maxwell's speed distribution curve
	6	maxwell's speed distribution curve,real gas and vander waal's equation,significance of vander waal's constant,compressibility factor(Z)
	7	variation of compressibility factor with pressure,calculation of compressibility factor in different conditions
	8	variation of compressibility factor with temperature,liquefaction of gases & andrew's isotherms,critical temperature,pressure & volume
	9	virial equation of state,boyle's temperature & inversion temperature,collision theory & mean free path
<b>Chemical Equilibrium-7</b>	1	introduction,law of mass action,equilibrium constant & its expression
	2	writing the expression of equilibrium constant,relation between $K_p$ & $K_c$ and their units,characteristics of equilibrium constant,calculation of $K_p$ & $K_c$ for various reactions
	3	calculation of $K_p$ & $K_c$ ,illustrations on $K_p$ & $K_c$
	4	degree of dissociation, Calculation of $k_p$ and $k_c$ by degree of dissociation method, Calculation of Degree of dissociation by Vapour Density measurement
	5	Significance of Equilibrium Constant, Reaction Quotient and its Application, le-chatlier's Principle
	6	le-chatlier's principle(effect of temperature, addition of inert gas and catalyst) Simultaneous equilibrium
	7	physical equilibrium, vapor pressure and boiling point, triple phase diagram, relative humidity

<b>Ionic Equilibrium -14</b>	1	introduction, acid base theories, amphiprotic species and conjugate acid base pairs, self Ionisation
	2	weak and strong electrolytes, Ionisation constant of weak and strong electrolyte, common ion effect and its application
	3	numericals on common ion effect, properties of water, ionic product, pH scale, pH calculation for strong monoprotic acids
	4	pH calculation of strong diprotic acid, pH of mixture of strong acids or strong bases, pH of mixture of strong acid and strong base, pH of weak monoprotic acids and bases
	5	pH of mixture of weak acid and strong acid, pH of mixture of two weak acids, relative strength of weak acids, pH of weak diprotic acid and bases
	6	relation between $K_a$ & $K_b$ for conjugate acid base pair, types of salt and salt hydrolysis, hydrolysis of salt of different types
	7	hydrolysis of salt of W.A and W.B, illustration, hydrolysis of polyprotic ions
	8	Hydrolysis of Amphiprotic Ions, Buffer Solutions, Working of Buffer, pH Calculation for Buffer Solutions
	9	Illustrations, effective buffer range, buffer capacity
	10	Isohydric Solutions, Acid-Base Titrations
	11	theory of indicators,color transition range,titration curves & selection of indicator
	12	Titration of Weak Base vs Strong Base, Titration of Polyprotic Acid vs Strong Base, Solubility & Solubility Products
	13	Calculation of Solubility in Pure Water, Solubility in Presence of Common Ion, Simultaneous Solubility, Condition for Precipitation, Significance of Value of $K_{sp}$
	14	selective precipitation,solubility of salt of acid in different cases,complex formation equilibrium
	1	Basic terms used in thermodynamics system,surrounding,boundary or wall,extensive & intensive properties
	2	State function,path function,heat capacities
	3	Molar heat capacity( $C_v$ & $C_p$ ),degree of freedom for monoatomic,diatomic,triatomic gas
	4	Law of Equipartition energy,internal energy(for ideal gas & solid and liquid)
	5	internal energy for real gases, heat and work
	6	zeroth law of thermodynamics, first law of thermodynamics, enthalpy
	7	relation between $\Delta H$ & $\Delta U$
	8	reversible and irreversible processes,comparison of work done in reversible and irreversible processes

<b>Thermodynamics -18</b>	9	thermodynamic processes, reversible & irreversible process, analysis of a) isobaric process b) isochoric process c) isothermal process
	10	reversible and irreversible adiabatic process, comparison of final temperature in reversible and irreversible adiabatic, comparison of isothermal & adiabatic process
	11	free expansion, cyclic process, polytropic process
	12	extra topic (Kirchhoff's law)
	13	limitations of first law of thermodynamics, spontaneous and non-spontaneous process, Carnot cycle and its efficiency
	14	entropy and its significance, mathematical definition of entropy, condition for spontaneity, statements of 2nd law
	15	calculation of entropy of system, surrounding and total entropy for isochoric process, isobaric process, isothermal process, adiabatic process
	16	calculation of entropy in free expansion, entropy change for heating of solid, liquid & gas, entropy of reaction, third law of thermodynamics
	17	introduction of Gibbs function, criteria for spontaneity, physical significance of Gibbs free energy
	18	variation of Gibbs free energy with pressure and temperature, Gibbs free energy and equilibrium constant
<b>Thermochemistry -6</b>	1	introduction, enthalpy of formation, enthalpy of combustion, Hess's law
	2	introduction, enthalpy of formation, calculation of enthalpy of reaction by enthalpy of formation, enthalpy of combustion
	3	enthalpy of neutralisation and its calculation, lattice enthalpy & Born-Haber cycle
	4	enthalpy of hydration, enthalpy of solution, enthalpy of atomisation & other enthalpies
	5	calorimetry, adiabatic flame temperature
	6	bond energy, bond dissociation energy, resonance energy
	1	oxidation number and its calculation
	2	some special cases in oxidation numbers
	3	oxidation & reduction, oxidising agent & reducing agent, redox reaction & their types
	4	balancing of redox reaction by ion-electron method
	5	balancing of oxidation number method, balancing of disproportionation reaction
	6	n-factor & its calculation

<b>Redox Reaction -17</b>	7	calculation of n factor for oxidising agent,n-factor when O.N. of more than one element changes
	8	calculation of n-factor,n-factor for disproportionation reaction,n-factor for intramolecular redox reaction
	9	calculation of eq. mass,calculation of no. of equivalent,normality
	10	Normality of minning & dillution,introduction of equivalent concept
	11	titration(introduction),redox titration
	12	question based on redox titration,acid base titration
	13	acid base titration,iodometric titration
	14	iodometric & iodometric titration,concept of bleaching powder & H2O2
	15	question based on double titration,hardness of water
	16	back titration & double titration
	17	degree of hardness of water conversion of hardness in terms of other salts
<b>Solid State-10</b>	1	introduction,amorphous & crystalline solids,types of crystalline solids,crystal lattice & unit cell,types of unit cell & bravias lattices
	2	analysis of unit cell,simple cubic unit cell,bcc unit cell
	3	analysis of Fcc unit cell,density of unit cell
	4	discussion of DPP-2,close packing of atoms,tetrahedral void & octahedral voids
	5	packing the 3rd layer over 2nd layer:-HCP & CCP structure analysing
	6	location of octahedral & tetrahedral voids,limiting radius ratio & its calculation
	7	questions based on radius ratio rule,structure of NaCl & CsCl type
	8	zinc blende structure,wurtzite structure,fluorite and antifluorite structure,defects in solids (schottky & frenkel defects)
	9	non-stoichiometric defects,magnetic properties of materials
	10	bragg's equation



<b>Liquid Solution -12</b>	1	Defination of solution,vapour pressure of a liquid:evaporation & condensation,variation of vapour pressure with temperature,boiling point
	2	Raoult's law, vapor pressure of an ideal binary solution containing and volatile liquid
	3	"liquid and vapor composition curve for ideal solution, variation of composition of liquid and vapors with external pressure"
	4	illustration of variation of composition of liquid and vapour with external pressure,principle of isobasic and isothermal disticlation
	5	vapor pressure composition curve,boiling point composition curve,illustrations solved in class,vapor pressuse of two immisible liquids (Nalatile)
	6	ideal and non-ideal solution, illustration on identification & characteristics of ideal and non-ideal solution
	7	"azeotropic mixture,their types and properties,colligative properties, relative lowering in vepper pressure"
	8	elevation in boiling point,experimental determination of rcvp,illustrations on colligative properties(rlvp)
	9	illustration on elevation in bothing point, depression in freezing point
	10	illustration based on depression in freezing point, osmotic pressure & osmosis
	11	illustration of osmotic pressure,van't hoff factor
	12	good illustration on van't hoff factor,solubility of gases in liquids,henry law,raoult's law as a special case of henry's law
<b>Chemical Kinetics -19</b>	1	introduction,rate of reaction,rate of appearance & disappearance
	2	rate of reaction,rate in terms of pressure
	3	rate law or rate expression,elementary & complex reaction,order & molecularity
	4	significance of order of reaction,expression determination of order of reaction,unit of rate constant
	5	integrate rate equation for zero order reaction,character of zero order reaction
	6	first order reaction,completion time,characteristics of first order reactions
	7	characteristics of first order reaction., problem based on first order
	8	secound order reaction, nth order reaction, monituring of first reaction in terms of pressure
	9	monitoring the process, of reaction terns of pressure

	10	monitoring the progress of reaction,by measuring value of gases evolved,by measuring value of alkali used,by measuring angle of rotation
	11	rate in terms of angle of rotation,rate in terms of thickness of oxide film,pseudo first order reactions
	12	Parallel first order reactions,Numerical based on parallel first order reaction
	13	kinetics of reversible first order reaction, kinetics of series first order reaction
	14	method to determine order of reaction
	15	collision theory & its application
	16	arrhenius equation & numericals based on it, temperature coefficient
	17	maxwell's speed distribution curve, variation of equilibrium constant with temperature, factors affecting rate of reaction
	18	effecting of catalyst on reaction rate, reaction mechanism, energy diagram for complex reaction, writing rate law for complex reaction
	19	steady state approximation, miscellaneous numericals
<b>Radioactivity-6</b>	1	radioactive emissions & their nature calculation of alpha,beta & gamma particles, group displacement law
	2	kinetic of radioactivity, activity & its units, numerical problems
	3	carbon dating, uranium dating, estimation of value of blood
	4	series & parallel decay, stability of nucleus, cause of radioactivity
	5	K-electron, $\gamma$ -emission,artificial radioactivity,stability of nucleus,binding energy
	6	Nuclear fission:-atomic bomb,nuclear reactor,nuclear fusion
	1	introduction,type of electrochemical cells,galvanic cell & its working,functions of salt bridge
	2	properties of inert electrolyte,effect of external battery on galvanic cell,representation of cell
	3	electrode potential,EMF of cell,standard hydrogen electrode,measurement of standard electrode potential,significance of standard electrode potential
	4	electrochemical series, $\Delta G$ & $E_{cell}$ ,nernst equation,application of nernst equation for a half cell
	5	different types of half-cells and their application in numericals

<b>Electrochemistry -19</b>	6	using nernst equation on a complete cell	
	7	electrolytic concentration cell	
	8	electrode gas concentration cell,metal sparingly soluble salt-anion electrode and its application	
	9	questions based on molten electrode,when 2 or more half cell reactions are combined to form a new half cell reaction,thermodynamics of cell	
	10	electrolysis & electric cell,product of electrolysis	
	11	products of electrolysis of NaCl,HCl,H <sub>2</sub> SO <sub>4</sub> ,CuSO <sub>4</sub> ,important points to remember for electrolysis	
	12	quantitative analysis of electrolysis and faradays first law	
	13	faraday's law of electrolysis,classification of conductors	
	14	"introduction to conductivity cell and important terms (conductance,conductivity and molar conductivity)"	
	15	equivalent conductivity, variation of conductivity and molar conductivity with dilution	
	16	variation of molar conductivity with dilution ( for strong and weak electrolyte ) , Kohlrausch's law and Ostwald's dilution law	
	17	calculation of degree of dissociation of weak electrolyte,calculation of solubility product of sparingly soluble salt	
	18	ionic mobility,conductometric titration(titration of SA vs SB,titration of WA vs Sb)	
	19	conductometric titrations,precipitation titration,types of batteries	
	<b>Surface Chemistry-7</b>	1	#adsorption and absorption, # mechanism and thermodynamics of adsorption, # types of adsorption
		2	adsorption isotherm(Freundlich isotherm,Langmuir's isotherm),adsorption from solution,catalysis (types of catalysis),promoters and poisons
		3	theory of catalyst, characteristics of catalyst, enzymes, characteristics of enzymes
		4	colloidal solution,classification of colloids(based on size of particle,based on physical state of dispersion medium and dispersed phase),micelles,classification based on interaction of dispersed phase and dispersion medium
		5	preparation of colloids,dispersion method & condensation method,properties of colloid
6		properties of colloid:-charge on colloid,Tyndall effect,color of a colloid,brownian movement	
7		#coagulation, methods of coagulation #purification of colloid's #emulsion's & test of emulsion's	

<b>Periodic Table-6</b>	1	Introduction, Screening / Shielding Effect, Effective Nuclear Charge
	2	Variation of Effective Nuclear Charge, Atomic Radius, Variation of Atomic Radius in S,P and D-Block
	3	Variation of Size in F-block, Size in Isoelectronic Series, Ionisation Energy and its Variation
	4	Application of I.E , Inert Pair Effect, Electron Gain Elthalpy, Electron Affinity
	5	Electron Affinity and its Variation, Electronegativity, Scale to Measure Electronegativity
	6	Allred-Rochow Scale, Factors Affecting Electronegativity, Applications of Electro Active, Acidic & Basic Character of oxides, Hydration Energy & It's Applications
<b>s-block-5</b>	1	Introduction, General Physical Properties of Alkali Metals & Alkaline Earth Metals
	2	Solution in Liquid Ammonia , Chemical Properties of Alkali and Alkaline Earth Metals Compounds of Alkali and Alkaline Earth Metals
	3	Carbonates & Bicarbonates, Nitrates, Sulphates, Nitrates points of Difference of Li, Diagonal Relationship, Important Compounds of Alkali Metals (Sodium Hydroxide (NaOH))
	4	NaOH, Sodium Chloride (NaCl), Sodium Bicarbonate(NaHCO <sub>3</sub> ), Sodium Carbonate (Na <sub>2</sub> CO <sub>3</sub> )
	5	Anomalous Behaviour of B.E, Important Compounds of A.E.M.[MgCl <sub>2</sub> .6H <sub>2</sub> O,MgCl <sub>2</sub> , Calcium Oxide (CaO), CaOCl <sub>2</sub> , CaSO <sub>4</sub> .2H <sub>2</sub> O (Gypsum)]
<b>Chemical Bonding-15</b>	1	Introduction to chemical bonding, Types Of Chemical Bonds - Ionic, Covalent & Coordinate Bonds, Lewis Octet Rule & Lewis Dot Structure
	2	Exceptions to Lewis Octet Rule, Formal Charge & Its application, Lewis Acid- Base Concept
	3	Valence Bond Theory, Concept Of Overlapping, Formation of sigma, pi & Delta Bonds
	4	Hybridization , predicting geometry on the basis of hybridization, calculation of hybridization state in different compounds, electronegativity and hybridization
	5	VSEPR & its application, Equivalent and non-equivalent Hybridized orbitals, Calculation of pp-pp & pp-dp bonds, Hybridisation in solid state
	6	Bent Rule & Its application, Bond order and its calculation
	7	Bond Angle & Drago's rule, Comparison of Bond Angle, Bond length and comparison of bond length
	8	Dipole moment & Its application
	9	Miscellaneous type of bonds, Back - Bonding , Banana bond,
	10	Molecular Orbital Theory & Formation Of molecular orbitals & Their energy Order
	11	Filling of electrons, Bond Order, magnetic character and stability of species, MOT for Heteroatomic species

	12	Hydrogen Bonding , Strenth Of H bonding,Intermolecular & Intramolecular H - Bonding, Comparision of Physical properties on the basis of H- Bonding
	13	Symmetrical & Asymmetrical H- Bond , Vander Waal's Forces,
	14	Ionic Bond, Polarisation & Fajan's Rule and Its application,
	15	Applications of Fajan's Rule - Comparision Of Covalent character, Thermal stability Of compounds, Color of compounds, Solubility of ionic compounds in water
<b>P-Block Elements-13</b>	1	Introduction, General Properties of P-Block Elements, Inert Pair Effect, Anamolous Behaviour of First Member of Group
	2	Boron Family, Compounds of Boron, Borax, Baric Acid
	3	Diborane & its Properties, Carbon Family & its Properties
	4	Allotropes of Carbon, Important Compounds of Carbon
	5	Silicon and its Compound Silica, Silicates, Silicones
	6	Zeolites, 15th Group Elements, Hydrides of 15th Group Elements Stablity, Oxides of Nitrogen, Compounds of Nitrogen
	7	Compounds of Nitrogen, N <sub>2</sub> - uses of N <sub>2</sub> , NH <sub>3</sub> - Preparation, Properties
	8	Test for ammonia,Oxides of nitrogen & their properties,Nitric acid & its properties
	9	Phosphorus and its Compounds, Allotropes of Phosphorus, White Phosphorus, Red Phosphorus, Black Phosphorus, Phosphine(PH <sub>3</sub> ), Acids of Phosphorus, Halides of Phosphorus
	10	Oxygen Family, Physical Properties Compounds of 16th Group, 1.Dioxygen(O <sub>2</sub> ), 2. Ozone (O <sub>3</sub> )
	11	Sulphur & its Allotropes, Sulphur Dioxide, Sulphur Trioxide, Sulphoric Acid, Oxoacids of Sulphur
	12	Halogen Family & their Compounds
	13	Noble Gases & their Components, Uses of Noble Gases
	1	Introduction,Complex Compounds and Double Salts, Central Metal Atom,Ligands and Their Classification
	2	Co-ordination Number,Classification of Ligands on the Basis of Denticity, Chelating Ligands and Chelates
	3	ambidentate ligand,flexidentate ligands,classical and nonclassical ligands, $\pi$ -donor and $\pi$ -acceptor ligands,oxidation number
	4	effective atomic number
	5	naming of bridging complexes,werner's coordination theory

<b>Co-ordination Compound-13</b>	6	valence bond theory(VBT),assumptions of VBT and Important Aspects,Complexes with CN=4
	7	complexes with CN=6 and 5,Limitations of VBT
	8	crystal field theory,crystal field splitting in octahedral field,filling of electrons in octahedral complexes
	9	cystal field splitting in tetrahedral and square planar field,comparision of CFSE,factors affecting CFSE
	10	stability of complex compounds,color of complex compounds,charge transfer spectra
	11	jahn-teller distortion(tetragonal distortion),stability of complexes
	12	isomerism in coordination compounds,structural isomerism,stereoisomerism
	13	isomerism in octahederal complexes
<b>Metallurgy-9</b>	1	Introduction, Method for Metallurgical Extraction, Concentration, Gravity Separation, Magnetic Separation
	2	Forth Floatation, Calcination, & Rousting Flux & Slag
	3	Reduction of oxide to metal, Ellingham Diagram, Reduction by C (smelting)
	4	Reduction of Metal Oxide and Refining of Metals
	5	Metallurgy of Iro
	6	Metallurgy of Copper (Cu)
	7	Metallurgy of Lead (Pb)
	8	Extraction of Aluminium
	9	Metallurgy of silver
<b>Hydrogen-3</b>	1	Physical & Chemical properties & reactions
	2	Covalent & Metallic Hydrides,Ortho & para Hydrogen, Water & Its Properties,Hard & Soft Water
	3	Properties of Heavy Water, H2O2 and its Properties
<b>d and f-block-6</b>	1	Introduction,Physical Properties of D-block Elements
	2	Trend in SRP Values, Stability of Higher Oxidation States, Color of Ions
	3	Catalytic Properties, Some Important Compound of D-block, Potassium Permagnet, Potassium Dichromate
	4	Chromyl Chloride Test, Compounds of Zn (Zno), Compounds of Ay (Ag No3)
	5	Compounds of Copper, Compounds of Iron
	6	Compounds of Mercury, Properties of lanthanides & Actinides

## Course Planner for LEADER Batch (Class 13th Student)

### BIOLOGY COURSE SCHEDULE

#### NEET Yearlong Biology for Class 13th of NEET 2021 by AA Ma'am

CHAPTER NAME	NO. OF LECTURES	CONTENT OF CHAPTER
<b>Digestion</b>	1	Steps of nutrition, Nutrients, Minerals, Vitamins, PEM
	2	Human Digestive System, Buccal cavity, palate, Tongue, Teeth
	3	Pharynx Histology of Alimentary canal Oesophagus, stomach
	4	Small & Large Intestine, Salivary glands, Liver Gall Bladder
	5	Pancreas, Digestive juices, physiology of Digestion
	6	Absorption, Assimilation, Excretion.
	7	GI Hormones, Hepatic portal system, Compound stomach, GIT disorders
<b>Breathing</b>	1	Respiration types , Respiratory organs, Human Respiratory tract
	2	Lungs, Pleura, Breathing mechanism, Pulmonary volumes & capacity
	3	Exchange of Gases of Tissues Alveoli, Transport of O <sub>2</sub>
	4	Transport of CO <sub>2</sub> , Regulation of Breathing
	5	Respiratory diseases ,CO poisoning
<b>Body fluids</b>	1	Open & closed circulatory system ABO & Rh blood groups
	2	Blood vessels, Evolution of Heart, Human Heart, External structure.
	3	Human heart Internal structure, Nodal tissue
	4	Heart Rate Regulation, Cardiac Cycle, Double circulation, Coronary System & Hepatic portal system.
	5	Hypophyseal & Renal portal system, Pulse Blood pressure, CUS disorders, Lymphatic System.
	1	Excretory organs & products, Human Excretory system kidney
	2	Internal structure of kidney, Ureter, Urinary bladder Urethra

<b>Excretory</b>	3	Nephron- Structure, types, Urine passage
	4	Urine formation, Counter- current mechanism
	5	Urine Composition, Abnormal Urine constituents. Osmoregulation (JGA & RAAS)
	6	Urea cycle, Renal disorders, Dialysis
<b>Locomotion</b>	1	Types of movement, Muscles types & Structure Sarcomere
	2	Myosin & Actin filament Sliding filament theory, Energy sources of muscle
	3	Cori cycle, Red & White muscle, disorders of Muscular system
	4	Skeletal system, Axial System
	5	Appendicular system, Joints, Disorders of skeletal system
<b>Neural Control</b>	1	Nerve Impulse Generation & Conduction, synapse
	2	Statutory Conduction, Nervous system, Classification, Meninges, Ventricles of CNS, CSF, Grey & White matter
	3	Forebrain, midbrain, Hindbrain, Brain Stem
	4	Spinal Cord, spinal & Cranial Nerves, Reflex Action
	5	Autonomic Nervous system
	6	Sense organs classification, skin & olfactory receptors
	7	Gustatory Receptors, Eye structure h. Retina M/A vision, Accommodation, Eye disorders i. Human Ear
<b>Chemical coordination</b>	1	Hormones –Properties, Classification, M/A, Pituitary gland
	2	Hypothalamic Control, Pineal, Thymus gland
	3	Thyroid, Parathyroid gland
	4	Pancreas, Adrenal gland
	5	Gonads, Synergistic, Antagonistic hormones



	6	Feedback Inhibition, Other hormone producing organs
Reproduction in organisms	1	Life span , Asexual reproduction
	2	Vegetative Propagation
	3	Sexual Reproduction & Parthenogenesis
Sexual Reproduction in flowering plants	1	Structure of Flower , Androecium
	2	Microsporogenesis, Pollen grain, Male gametophyte
	3	Gynoecium, Structure & Types of ovules, Megasporogenesis
	4	Female gametophyte, Pollination- Types , Agents, Adaptation
	5	Anemo/ Hydro/ Entomophily, Pdle- Pistil Interaction
	6	Double Fertilization, Dicot Embryo, Monxot Embryo
	7	Endosperm development, seeb
	8	Fruit development , Apomixis , Polyembryony
Human Reproduction	1	Male Reproductive System
	2	Internal Structure of Testis, Hormonal control
	3	Spermatogenesis, Sperm Structure, Disorders
	4	Female reproductive System
	5	Mammary glands, folliculogenesis
	6	Dogenesis, Hormonal Control, Menstrual cycle
	7	Egg & Egg membranes
	8	Fertilization process
	9	Embryology

	10	Embryology
	11	Placenta, Umbilical cord
	12	Gestation, Parturition, Lactation
<b>Reproductive Health</b>	1	Population Explosion, Family planning, RCH, Methods of Control
	2	Contraception, STDs
	3	Infertility
<b>Cell -the unit of the life</b>	1	Historic background, prokaryotic & Eukaryotic cell structure of typical bacterial cell
	2	Plant & Animal cell , cell wall, Plasmodesmata
	3	Cell membrane, Vacuoles
	4	ER, Golgi body, Lysosomes, Microbodies , Ribosomes
	5	Mitochondria & plastids
	6	Cytoskeleton, Centriole, Cilia & flagella
	7	Nucleus, Chromatin, Chromosomes
<b>Cell cycle &amp; cell Division</b>	1	Basis for cell division, Amitosis, cell cycle
	2	Mitosis
	3	Meiosis
<b>Biomolecules</b>	1	Primary & Secondary Metabolites, Ash Analysis, Amino acids
	2	Proteins , Lipids
	3	3. Lipids, Mono & Oligosaccharides
	4	Polysaccharides, Nucleoside & Nucleotides
	5	Phospho-di-ester bond, Structure of DNA

<b>Principles of Inheritance</b>	1	Blending inheritance, Terminology, Mendelion
	2	Rediscovery, Reason for Non-recognition & Success of mend
	3	Law of Dominance, Law of Segregation
	4	Exceptions to law of Dominance
	5	Dihybrid cross, Law of Independent Assortment
	6	Non-Allelic Interactions
	7	Chromosomal theory of inheritance
	8	Linkage
	9	Sex determination Mutations
	10	Genetic disorders
	11	Cytoplasmic inheritance
	12	RH inherifance , Pedigrel
<b>Mole cular Basis of Inheritance</b>	12	. Numericals
	1	1Nucleic acid , Double helix DNA, DNA packaging, Types of DNA
	2	Search for Genetic material Properties , RNA world
	3	Mechanism of DNA Replication
	4	RNA Structure, Types. Transcription Unit , Transcription
	5	Transcription, Gene code, Gene mutation
	6	Gene regulation, Lac Operon, HGP
	7	DNA fingerprinting , VNTRs
8	Numerical solving	

<b>Evolution</b>	1	Origin of Universe, earth (theories), Chemical evolution, Urey – Miller experiment
	2	Evidences of evolution
	3	Geological Time s\Scale, Lamarcksm
	4	Darwinism, Mutation theory, Neo- darwnism
	5	Hardy- Weinberg equilibrium, speciation, Natural selection
	6	Human Evolution, Phylogeny of horse
<b>The Living world</b>	1	Characteristics of Living, Taxonomy
	2	Nomenclature, Taxonomic heirarchy, Tautonym, Autonym
	3	Species- concept, types, Taxnomic Aids
<b>Biological classification</b>	1	Aristotte, 2/3/4/5/6 Kingdom classification, Monera –I
	2	Bacteria
	3	Repraqduction in bacteria, BGA
	4	Mycoplasma, Rickettsia , Chlamydia, Actinomycetes
	5	Archaeobacterai, Protista-I (Dinoffagellates)
	6	Protista –II (Diatoms, Eudlenoids, Slime moulds)
	7	Fungi – I h. Fungi –II i. Lichens, Viruses, Viroids, Prions
<b>Plant kingdom</b>	1	Classification systems, Taxonomy branches, Algae
	2	Red/ Brown/ Green Algae, Economic Importance life
	3	Bryophtes-I
	4	Bryophytes- II
	5	Pteridophytes

	6	Gymnosperms
	7	Angiosperms, Life cycle patterns in Plants Comparative study of all groups.
<b>Animal Kingdom</b>	1	Classification, Euglenoids, Protozoa
	2	Protozoa
	3	Classification of metazoan, Porifera
	4	Porifera, coelenterate, Ctenophora
	5	Platy & Aschelminthes
	6	Annelida, Arthropoda
	7	Arthropoda, Mollusca h. Echinodermata, Hemichordata i. General characters of chordate. Protochordata
<b>Biotech Principal</b>	1	Principles, rDNA construction, Gene cloning, Enzymes
	2	Restriction Enzymes
	3	Vectors & Competent host
	4	Processes – Gel Electrophoresis, PCR
	5	Transformation of Host, Bioreactors, Downstream processing
<b>Biotech &amp; applications</b>	1	Genetically Engineered Insulin
	2	Gene Therapy, Monoclonal Antibodies
	3	PCR, ELISA, Autoradiography, Green Revolution
	4	Golden Rice, Hirudin, Bt cotton
	5	RNAi, Flavr Savr Tomato, Pest-resistant plants
	6	Transgenic Organisms, Cloning, Biopiracy, bioethics
	1	General characters, Root system * Root modifications

<b>Morphology of Flowering plants</b>	2	Root & stem modifications
	3	Stem modification & Leaves
	4	Venation , Phyllotaxy, Modifications of Leaves
	5	Inflorescence
	6	Flower- calyx, Cordla, Aestivation
	7	Androecium & Gynoecium h. Placentation, Fruits & types i. Seeds
	<b>Anatomey</b>	1
2		Permanent simple Tissue
3		Complex permanent Tissue
4		Epidermal & Ground & Vascular Tissue system
5		Anatomy of leaf & Roots
6		Anatomy of stem, Secondary growth in dicot stem
7		Types of wood, periderm, Bark h. Lenticels, secondary Growth in Dicot Root
<b>Organisms &amp; Population</b>	1	Ecological Hierarchy, Habitat, Niche, Climatic Zones
	2	Biomes, Temperature, water, Light
	3	Soil, Response to Abiotic factors
	4	Adaptations in Animals & Plants
	5	Population Attributes & Growth models
	6	Interactions
	1	Types & Components of ecosystem, structure
	2	Productivity, Decomposition

<b>Ecosystem</b>	3	Energy flow, food chains & food webs
	4	Ecological Pyramids, Succession Types
	5	Nutrient Cycling, Ecosystem Services
<b>Biodiversity &amp; conservation</b>	1	Genetic , Species & Ecological biodiversity, Global Indian diversity
	2	Patterns of biodiversity, David Tilman experiment Rivet Popper hypothesis
	3	Causes of , biodiversity loss , Reasons for Conservation, Extinction susceptibility
	4	In-situ & Ex-situ methods of conservation
<b>Environment issues</b>	1	Pollution Types , Air pollution
	2	Bhopal gas Tragedy, Vehicle pollution Noise pollution
	3	BOD & DO Relation, water pollutions, Case study of Integrated waste water Treatment
	4	Chemical oxygen Demand , Bio magnification, Eutrophication, Case study for hastic waste Remedy
	5	Case Study of organic Farming, Green house effect, Global warming
	6	International Initiates for GHG & Ozone depletion, Peoples initiatives for wildlife protection
<b>Human health &amp; disease+C35</b>	1	Introduction , Bacterial disease
	2	STDs, Viral diseases
	3	Viral & Helminthic diseases
	4	Helminthic & Protozoa diseases
	5	Malaria
	6	AIDS, Cancer
	7	Immune System – Lymphoid organs, Types of Immunity
	8	Aquired Immunity

	9	Active & Passive Immunity , Auto-Immune, Immunity, Allergy
	10	Mental Health , Alcohol & Drug Abuse
<b>Microbes in human welfare</b>	1	Microbes in household products, Industrial products
	2	STPs, Biofertilizers
	3	Biogas, Biocontrol Agents
<b>Strategies for enhancement</b>	1	Animal husbandry , Breeding types
	2	AI-MOET, Dairy & Poultry farming
	3	Api, Seri, Lac & Aquaculture
	4	Plant Breeding steps
	5	Hybridisation, Inbreeding depression, Polyploidy
	6	Mutation breeding , Green Revolution, Disease Resistance
	7	Insect resistance, Biofortification, SCP, PTC Methods
<b>Transport in plants</b>	1	Types & Direction of Transport & Solution Membrane permeability, Active & Passive Transports Diffusion pressure.
	2	Facilitated diffusion, Uni/ sym/ Antiport, Plant- water , Relation, Osmosis, Osmotic pressure, Osmotic potential
	3	Plasmolysis, Turgid & Flaccid cell, Turgor & wall , pressure, water potential
	4	Solute potential , pressure potential, DPD, Imbibition
	5	Long distance transport in plants Bulk flow, positive & negative hydrostatic pressure gradient
	6	Apoplast, symplast pathway, mycorrhiza, soil water types, Ascent of sap-Root pressure
	7	types, Ascent of sap-Root pressure Guttation, Transpiration pull & types, Cohesion-Tension- Transpiration pull theory h. Stomata apparatus. Opening & Closing of stomata.
	1	Hydroponics, Macro & Micronutrients, Beneficial , elements,, disease, symptoms of essential elements
	2	Element toxicity , N, P,K, Mg,Ca,S



<b>Mineral nutrition</b>	3	Role & Deficiency symptoms of Micronutrients, Uptake & transport, Soil-Reservoir of elements
	4	Metabolism of N <sub>2</sub> , N <sub>2</sub> Cycle, N <sub>2</sub> fixation, Biological N <sub>2</sub> fixers, Root nodule formation,
	5	N <sub>2</sub> fixation mechanism, Fate of Ammonia
<b>Photosynthesis</b>	1	Historical background, site of photosynthesis
	2	Photosynthesis pigments, Absorption & Action spectrum, Red Drop, Emerson enhancement
	3	Photosystem 1 & 2, Light Reaction- water photolysis Cyclic Photophosphorylation
	4	Non- cyclic photophosphorylation, ETS, Chemiosmotic Theory for ATP formation, Quantum Yield & requirement
	5	Dark Reaction (C <sub>3</sub> Pathway)
	6	C <sub>4</sub> /CAM pathway
	7	Photorespiration, Factors affecting photosynthesis Bacterial photosynthesis, C <sub>3</sub> & C <sub>4</sub> difference
<b>Respiration</b>	1	Salient features, Respiratory fuels, Do plants breathe? Types of respiration
	2	Glycolysis, Fate of Pyruvic Acid
	3	Alcoholic & LA fermentation, Link Reaction, Respiratory Quotient
	4	Krebs Cycle
	5	ETS, Oxidative phosphorylation
	6	Respiration inhibitors, Respiration Balance sheet, GP & MS shuttels, PPP, Amphibolic pathway, Factors affecting respiration
<b>Plant growth &amp; Development</b>	1	Growth – characteristics, Types, phases, Arithmetic & Geometric growth
	2	Conditions for growth, differentiation, dedifferentiation, plasticity & Heterophylly, PGRS-Classification & Chemical nature
	3	Auxin Gibberallins
	4	Cytokinins, Abscissic Acid
	5	Ethylene, phytochromes & Photoperidism

	6	Effect of PGRs on Photoperiodism, Vernalisation, Difference between photoperiod & vernalisation
<b>Structural organisation in Animal</b>	1	Animal tissue Types & origin, Epithelia tissue- simple & compound
	2	Glandular epithelium, gland types
	3	Connective tissue- components & classification Loose, Dense 3.T
	4	Skeletal 3.t- Bones & Cartilage, Types of Bones & Curtilage, Halverson system in bone
	5	Vascular connective tissue- Blood (plasma, RBC, WBC, Platelet)
	6	Blood coagulation, Lymph
	7	Nervous tissue, Muscular tissue
	8	Earthworm
	9	Earthworm
	10	Cockroach
	11	Cockroach
	12	Cockroach
	13	Frog
	14	Frog
	15	Frog