RECOMMENDED SYLLABUS FOR CET

B.Nursing

PCB , Aptitude 20 marks and English 20 Marks

XI – PHYSICS	
1. Units and Measurements	System of units , Measurement of length , Measurement of mass , Measurement of time , Dimensions and dimensional analysis , Accuracy , Precision , and uncertainty in measurement , Errors in measurements , Significant figures , order of magnitude .
2. Mathematical Methods	Vector analysis : - Scalers , Vectors , Vector operations (multiplication , addition , subtraction of vectors Triangle law for vector addition , Law of parallelogram of vectors), Resolution of vectors , Multiplication of vectors (scaler product , vector product) , Introduction of calculus .
3. Motion in Plane	Rectilinear motion (Displacement , path length , average velocity , average speed , instantaneous speed , acceleration , relative velocity), Motion in two dimensions – Motion in plane(average and instantaneous velocity , acceleration . Equation of motion for object travelling in plane with uniform acceleration .relative velocity , Projectile motion) . Uniform circular motion : period , radius vector , angular speed , centripetal acceleration , conical pendulum.
4.Law of Motion	Aristotle's Fallacy , Newton's laws of motion , Inertial and non-inertial frame of reference . Types of forces (fundamental forces in nature , contact and non-contact forces , real and pseudo forces , conservative and non-conservative forces , concept of potential energy , work done by variable force) . Work – Energy theorem . Principle of conservation of linear momentum .Collisions(elastic and inelastic collisions, coefficient of restitution) .

	Impulse of force. Rotational analogue of force – moment of force or torque, couple and its torque , mechanical equilibrium , centre of mass , centre of gravity .
5. Gravitation	Kepler's law , Universal law of gravitation , Measurement of gravitational constant , Acceleration due to gravity , Variation in ' g ' with altitude ,depth ,latitude and shape Gravitational potential and potential energy , Escape velocity , Earth Satellite , Projection of satellite , Critical velocity ,Weightlessness in satellite , Time period of satellite , Binding energy of an orbiting satellite .
6.Mechanical Properties of Solids	Elastic behavior of solids , Stress and strain , Hooke's law Elastic modulus , Stress – Strain curve , Strain energy , Hardness , Friction in solids (static friction , kinetic friction , rolling friction) .
7. Thermal Properties of Matter	Temperature and Heat , Measurement of temperature , Absolute temperature and Ideal gas equation , Thermal expansion (linear expansion , areal expansion , volume expansion , relation between coefficients of expansion , Specific heat capacity , Colorimetry , Change of state , Heat transfer (conduction , convection , radiation) , Newton' laws of cooling.
8.Sound	Waves-Types of waves, Common properties of all waves, Tranverse Waves and Longitudinal waves , Mathematical expression of waves , Speed of travelling waves , Newtons Formula for velocity of sound, Laplace's correction , Factors affecting speed of the sound , Principle of superposition of the waves , Echo, reverberation and acoustics ,Qualities of sound , Doppler effect .

9. Optics	Nature of light, Ray Optics , Cartesian Sign convention , Reflection (Reflection from Curved mirrors ,Spherical abbreviation) Refraction , Total internal reflection and its applications , Refraction at spherical surface and lenses (Refraction at single spherical surface, Lens maker's equation), Dispersion of light and prism (Prism formula , deviation of light through thin prism , angular dispersion , dispersive power), Natural phenomena due to sunlight , Defects of lenses (Chromatic abbreviation , Spherical abbreviation), Optical instruments – Magnifying power of simple microscope , compound microscope , telescope .
10. Electrostatics	Electric charges , basic properties of the electric charges , Coulomb's law , Principle of superposition , Electric field , Electric lines of force , Electric flux , Gauss Law , Electric dipole (Couple acting on the electric dipole in the uniform electric field , Electric intensity at a point due to electric dipole) , Continuous charge distribution .
11. Electric Current through conductors	Electric current , Flow of the current through the conductor , Drift Speed , Ohm's Law , Electrical energy and power , Registers Rheostat , Combination of the registers , Specific Resistance (Resistivity), Variation of the resistance with the temperature , Electromotive force , Cell's in series , Cell's in parallel , Types of cells .
12. Magnetism	Magnetic lines of force and magnetic field , Bar magnet(Magnetic field due to bar magnet at a point along its axis and along it's equator , Magnetic field due to bar magnet at an arbitrary point), Gauss law of magnetism , Earth's magnetism.

13.Electromagnetic waves and Communication system	EM wave , Characteristics of EM waves , Electromagnetic spectrum – Properties and uses of Radio waves , Microwaves , Infrared waves , Visible Light , Ultraviolet rays , X-rays , Gamma Rays . Propagation of EM Waves – Ground wave propagation , Space wave propagation , Sky wave propagation . Introduction to communication system , Modulation .
14.Semiconductors	Electrical conduction in solids , Band theory of solids – Brief introduction , Intrinsic Semiconductor , Extrinsic semiconductor , P-N junction ,P-N junction diode .Semiconductor devices , Application of semiconductors and P-N junction diode .
15. Magnetic Field due to Electric Current	Magnetic force , Cyclotron motion , Cyclotron accelerator, Helical motion , Magnetic force on wire carrying current – 1) Straight wire 2) Arbitrarily shaped wire. Force on a closed circuit in a magnetic field , Torque on current loop , Moving coil galvanometer , Magnetic dipole moment , Magnetic potential energy of dipole , Magnetic field due to current (Biot – Savart law), Force of attraction between two long parallel wires , Magnetic field produced by current in circular arc of wire, Axial magnetic field produced by current in circular loop , Magnetic lines for current loop , Ampere's Law , Magnetic field of Solenoid and Toroid .
16. Magnetic Materials	Torque acting on a magnetic dipole in uniform magnetic field , Location of magnetic poles of current carrying loop, Origin of magnetism in materials , Magnetization and Magnetic intensity , Magnetic properties of materials, Hysteresis , Permanent magnet and electromagnet , Magnetic shielding .
17.Electromagnetic Induction	Faraday's experiment in connection with generation of electric current , Faraday's laws of electromagnetic induction , Lenz's law and its applications , Flux of

	field , Motional electromotive force , Induced emf in stationary coil in a changing magnetic field , Generators , Back emf and back torque , Induction and energy transfer , Eddy currents , Self- inductance , Energy stored in magnetic field , Energy density of magnetic field , Mutual inductance , Transformer .
18 AC Circuits	AC generator, Average and RMS values, Phasors, Different types of AC circuits: - AC voltage applied to resistor, AC voltage applied to an inductor, AC voltage applied to capacitor, AC circuit containing resistance, inductance, capacitance in series (LCR circuit), Power in AC circuit, LC oscillations, Electric resonance, Q- Factor, Choke coil.
19. Dual Nature of Radiation and Matter	Photoelectric effect, (Experiment and its observations), Failure of wave theory to explain observations from experiments on photoelectric effect, Einstein's postulate of quantization of energy and photoelectric equation, Wave-particle Duality of electromagnetic radiation, Photo Cell, De Broglie Hypothesis, Davisson an Germer experiment, Wave-particle Duality of matter.
20.Structure of Atoms and Nuclie	Geiger – Marsden experiment , Rutherford's atomic model , Atomic spectra , Bohr's atomic model , Expressions for radius of orbit , energy of electron ,Bohr formula , De Broglie's explaination , Atomic nuceus , nuclear forces , Nuclear binding energy , Radioactive decays , Law of radioactive decay , Half life of radioactive material , Average life of radioactive species , Nuclear energy (Nuclear fission , Nuclear fusion).
21. Semiconductor Devices	P-N junction diode as a rectifier , Filter circuits , Special purpose junction diodes : - Zener diode , Photo diode , Solar cell , Light emitting diode (LED), Bipolar junction transistor , Transistor configuration , Transistor as an amplifier , Logic gates .

XII - PHYSICS

1. Rotational Dynamics	Circular motion: Kinematics of circular motion ,Dynamics of circular motion (Centripetal force ,Centrifugal force) Applications of UCM: Vehicle along horizontal circular track, Vehicle on banked road, Conical pendulum : Period of revolution of bob , Frequency of revolution. Vertical circular motion. Moment of inertia : M.I. as an analogous quantity for mass ,Rotational K.E. , angular momentum , torque in terms of M.I. , M.I. of ring , disc , solid sphere , thin uniform rod , circular cone , uniform plate , uniform spherical shell , radius of gyration , Theorem of parallel axes and perpendicular axes , conservation of angular momentum , Rolling motion : Linear acceleration and speed while pure rolling down an inclined plane.
2. Mechanical Properties Of Fluids	Fluid – Properties of fluid , Pressure : Pressure due to liquid column , Absolute pressure and Gauge pressure , Hydrostatic paradox , Pascal's Law , Applications of Pascal's Law , Measurement of pressure (mercury barometer , open tube manometer). Surface Tension , Surface energy , Relation between S.T. and surface energy , Angle of contact , Effect of impurity and temperature on S.T. Excess pressure across free surface of liquid , Formation of drop and bubble. Capillary action Expression for capillary rise . Fluids in motion , Critical velocity and Reynold number , viscosity , Stokes' law , Equation of continuity , Bernoulli equation and its applications.
3. Kinetic Theory Of Gases And	Behaviour of gas , Ideal gas and real gas , Mean free path , Pressure of ideal gas , Interpretation of

Radiation	temperature in kinetic theory , Law of equipartition of energy , Degrees of freedom , Specific heat capacity (Mayer's relation) , Absorption , reflection , and transmission of heat radiation ,Perfect black body (Ferry's black body). Emission of heat radiation . Kirchhoff's law of heat radiation and its theoretical proof. Spectral distribution of black body radiation. Wien's displacement law , Stefan-Boltzmann law of radiation.
4.Thermodynamics	Thermal equilibrium , Zeroth law of thermodynamics , Heat , Internal Energy , Work . First law of thermodynamics (work and heat related), Thermodynamic state variables , Thermodynamic process , Classification of thermodynamic processes (Reversible and Irreversible process) , Assumptions of thermodynamic process. Thermodynamics of isothermal process , Isobaric process , Isochoric process , Adiabatic process, Cyclic process , Free expansion. Heat Engine , Heat engine cycle and P- V diagram , Refrigerators and heat pumps . Second law of thermodynamics , Carnot cycle and Carnot engine , Carnot refrigerator , Second law of thermodynamics and Carnot cycle , Sterling cycle .
5. Oscillations	Periodic motion , Linear S.H.M. , Differential equation of S.H.M. , Acceleration , velocity and displacement of S.H.M. and their expressions , Amplitude , period and frequency of S.H.M., Reference circle method , Phase in S.H.M., Graphical representation of S.H.M. , Composition of two S.H.M. s having same period and along the same path , Energy of particle performing S.H.M., Simple pendulum , Second's pendulum , Angular S.H.M. and its differential equation , Magnet vibrating in uniform magnetic field , Damped

	oscillations , Free oscillations , Forced oscillations and resonance .
6. Superposition of waves	Progressive wave , Reflection of waves , Superposition of waves , Stationary waves , Properties of stationary waves , Free and Forced vibrations , Harmonics and Overtones :- Vibrations of air column in pipe closed at one end and in pipe open at both ends , Vibrations produced in string , Laws of vibrating string , Sonometer(verification of first , second and third law of vibrating string) , Beats (analytical method to determine beat frequency) , Applications of beats , Characteristics of sound (loudness , pitch , quality or timbre) , Musical instruments.
7. Wave Optics	Nature of light:- Corpuscular nature , wave nature , dual nature of light . Huygens' wave theory , Huygens' principle , Reflection of light at plane surface , Refraction of light at plane boundary between two media , Dependence of wavelength on refractive index of medium , Polarization , Brewster's Law(polarization by reflection) , polarization by scattering , Interference : Young's double slit experiment , Conditions for steady interference , Method for obtaining coherent sources Optical path , Diffraction of light : Fresnel and Fraunhofer diffraction , Fraunhofer diffraction at a single slit , Double slit diffraction pattern , Resolving power – Rayleigh's Criterion for resolving power , Resolving power of microscope , Resolving power of telescope.
8.Electrostatics	Applications of Gauss' Law , Electric potential and potential energy , Electric potential due to point charge , electric dipole and system of charges , Equipotential surfaces , Electrical energy of two point

	charges and of a dipole in an electrostatic field , Conductors and insulators , free charges and bound charges inside a conductor , Dielectrics and electric polarization. Capacitors and capacitance , Combination of capacitors in series and parallel , Capacitance of parallel plate capacitor with and without dielectric medium between the plates .Displacement current , Energy stored in capacitor , Van de Graaff Generator .
9. Current Electricity	Kirchhoff's Laws of Electrical Network , Wheatstone Bridge , Application of Wheatstone bridge :- Metre bridge , Kelvin's method , Post office box . Potentiometer:- Use of potentiometer (Compare emf of cells , To find internal resistance of cell), Application of potentiometer(Voltage divider , Audio control, potentiometer as a sensor) , Advantages of potentiometer over voltmeter , Galvanometer :- Galvanometer as an ammeter , Galvanometer as a voltmeter .
10. Magnetic Field due to Electric Current	Magnetic force , Cyclotron motion , Cyclotron accelerator, Helical motion , Magnetic force on wire carrying current – 1) Straight wire 2) Arbitrarily shaped wire. Force on a closed circuit in a magnetic field , Torque on current loop , Moving coil galvanometer , Magnetic dipole moment , Magnetic potential energy of dipole , Magnetic field due to current (Biot – Savart law), Force of attraction between two long parallel wires , Magnetic field produced by current in circular arc of wire, Axial magnetic field produced by current in circular loop , Magnetic lines for current loop , Ampere's Law , Magnetic field of Solenoid and Toroid .

11. Magnetic Materials	Torque acting on a magnetic dipole in uniform magnetic field , Location of magnetic poles of current carrying loop, Origin of magnetism in materials , Magnetization and Magnetic intensity , Magnetic properties of materials, Hysteresis , Permanent magnet and electromagnet , Magnetic shielding .
12.Electromagnetic Induction	Faraday's experiment in connection with generation of electric current , Faraday's laws of electromagnetic induction , Lenz's law and its applications , Flux of field , Motional electromotive force , Induced emf in stationary coil in a changing magnetic field , Generators , Back emf and back torque , Induction and energy transfer , Eddy currents , Self- inductance , Energy stored in magnetic field , Energy density of magnetic field , Mutual inductance , Transformer .
13 AC Circuits	AC generator, Average and RMS values, Phasors, Different types of AC circuits: - AC voltage applied to resistor, AC voltage applied to an inductor, AC voltage applied to capacitor, AC circuit containing resistance, inductance, capacitance in series (LCR circuit), Power in AC circuit, LC oscillations, Electric resonance, Q- Factor, Choke coil.
14. Dual Nature of Radiation and Matter	Photoelectric effect, (Experiment and its observations), Failure of wave theory to explain observations from experiments on photoelectric effect, Einstein's postulate of quantization of energy and photoelectric equation, Wave-particle Duality of electromagnetic radiation, Photo Cell, De Broglie Hypothesis, Davisson an Germer experiment, Wave-particle Duality of matter.
15.Structure of	Geiger – Marsden experiment , Rutherford's atomic model , Atomic spectra , Bohr's atomic model ,

Atoms and Nuclie	Expressions for radius of orbit , energy of electron ,Bohr formula , De Broglie's explaination , Atomic nuceus , nuclear forces , Nuclear binding energy , Radioactive decays , Law of radioactive decay , Half life of radioactive material , Average life of radioactive species , Nuclear energy (Nuclear fission , Nuclear fusion).
16. Semiconductor Devices	P-N junction diode as a rectifier , Filter circuits , Special purpose junction diodes : - Zener diode , Photo diode , Solar cell , Light emitting diode (LED), Bipolar junction transistor , Transistor configuration , Transistor as an amplifier , Logic gates .

XI CHEMISTRY

1. Some basic Concepts of chemistry	Nature of chemistry,Properties of matter and their measurement ,laws of chemical combination ,Dalton's Atomic Theory,Atomic and molecular masses, mole concept and molar mass
2. Introduction to analytical chemistry	Importance of analytical chemistry, analysis, mathematical operation and error analysis,determination molecular formula, chemical reactions and stoichiometric calculations, limiting reagent, concentration of solution ,use of graph in analysis
3. Basic Analytical Techniques	Purification of solids, Distillation , solvent extraction , chromatographic techniques,
4. Structure of Atom	Subatomic particles, Atomic number ,atomic mass number, Isotopes, Isobars, Isotones, Drawbacks of Rutherford atomic model, Developments leading to Bhor's atomic model, Bhor's model for hydrogen atom, Quantum mechanical model of atom,
5. Chemical Bonding	Kossel and Lewis approach to chemical bonding, Steps to write Lewis dot structures, Formal charge, Valence shell electron pair repulsion theory, Valence bond theory,Hybridization, Molecular orbital theory, Parameters of covalent bond, Dipole moment, resonance
6. Redox Reactions	Classical ideas of redox reactions, Oxidation number, Balancing of redox reactions, Redox reaction and Electrode potential,
7. Modern Periodic Table	Introduction, Structure of modern periodic table, Periodic table and electronic configuration, Blockwise characteristics of elements, Periodic trends in elemental

	properties
8. Element of Group 1 and Group 2	Hydrogen:Occurrence, Position, Isotopes of Hydrogen, Prepration, Properties, Uses. Alkali metals and element of group 2, Some important compounds of element of S Blocks
9. Elements of groups 13,14,15	Introduction, Electronic configuration of elements of groups 13,14,15, Chemical properties of elements of groups 13,14,15, Catenation, Allotropy, Molecular structure of some important compounds of groups 13,14,15 elements, Chemistry of notable compounds of elements of group 13,14,15
10. States of Matter: Gaseous and Liquid States	Introduction, Intermolecular forces, Characteristic properties of gases, Gas Laws, Ideal gas equations, Kinetic molecular theory of gases, Deviation from ideal behavior, Liquefaction of gases and critical constant, Liquid state
11. Adsorption and Colloids	Adsorption, Types of adsorption, Factors affecting adsorption of gases on solids, Adsorption isotherm, Applications of adsorption, Catalysis, Adsorption theory of heterogeneous catalysis, Colloids
12. Chemical Equilibrium	Reversible reactions, Equilibrium in physical processes, Equilibrium in chemical process, Law of mass action and equilibrium constant, Homogeneous and Heterogeneous eqilibria, Characteristics of equilibrium constant, Application of equilibrium constant, Le Chatelier's Principle, Industrial application
13. Nuclear chemistry and Radioactivity	Similarity between solar system and structure of atom, Classification of nuclides, Nuclear stability, Radioactivity, Radioactive decay, Modes of decay, Nuclear reactios, Applications of radio isotopes

14. Basic principles of Organic Chemistry	Structural representation of organic molecules, Classification of organic compounds, Nomenclature of organic compounds, Isomerism, Therotical basis of organic reactions
15. Hydrocarbons	Alkanes: Isomerism, Conformation, preparation, Physical properties, chemical properties, uses. Alkene:Isomerism, preparation, physical properties, chemical properties, uses. Alkynes: Isomerism, preparation, physical properties, chemical properties, uses. Aromatic Hydrocarbons(Benzene):Structure, Preperation, physical properties, chemical properties. Huckel Rule, Directive influence of a functional groups in monosubstituted benzene, Carcinogenicity and Toxicity
16. Chemistry in Everyday Life	Basics of food chemistry, Compounds with Medicinal properties, Cleansing agents.

XII CHEMISTRY

1. Solid State	Types of solids, Classification of crystalline solids, Crystal structure, Cubic system, Packing of particles in crystal lattice, Packing efficiency, Crystal defects, Electrical properties of solids, Magnetic properties of solids
2. Solutions	Types of solutions, Capacity of solution to dissolve solute, Solubility, Vapour pressure of solutions of liquids in liquids, Colligative properties of non electrolyte solutions, Vapour pressure lowering, Boiling point elevation, Depression in freezing point, Osmotic pressure, Colligative properties of electrolytes
3. Ionic Equilibria	Types of electrolyte, Acids and Bases, Ionisation of acids and bases, Autoionisation of water, pH scale, Hydrolysis

	of salts, Buffer solutions, Solubility product, Common ion effect
4. Chemical Thermodynamics	Introduction, Terms used in Thermodynamics, Nature of heat and work, Expression for pressure-volume work, Concept of maximum work, Internal energy, First law of Thermodynamics, Enthalpy, Enthalpies of physical transformations, Thermochemistry, Spontaneous prosess.
5. Electrochemisry	Introduction, Electric conduction, Electrical conductance of solutions, Electrochemical cells, Electrolytic cell, Galvanic cell, Electrode potential and cell potential, Thermodynamics of galvanic cell, Galvanic cells useful in day to day life, Fuel cell, Electrochemical series.
6.Chemical kinetics	Rate of reactions, Rate of reaction and reactant concentration, Molecularity of elementary reactions, Integrated Rate law, Collision theory of bimolecular reactions, Temperature dependence of reaction rates, Effects of catalyst on rate of reaction.
7.Elements of groups 16,17,18	Occurrence, Electronic configuration, Atomic and physical properties, Anomalous behavior of oxygen and fluorine, Chemical properties, Oxoacids, Oxygen and compounds of oxygen, Compound of sulphur, Chlorine and compounds of chlorine, Interhalogen compounds, Compounds of Xenon.
8.Transition and Innertransition Elements	General introduction, Position in periodic table, Electronic configuration, Trends in atomic properties of first transition series, Compounds of Mn and Cr($KMnO_4$ and $K_2Cr_2O_7$), Common properties of d block elements, Metallurgy, Properties of f block elements
9.Cordination compounds	Introduction, Types of ligands, Terms used in coordination chemistry, classification of complexes,

	IUPAC nomenclature of coordination compounds, Effective atomic number rule, Isomerism in coordination compounds, Stability of coordination compounds, Theories of bonding in complexes, Application of coordination compounds.
10.Halogen derivatives	Classification of halogen derivatives, Nomenclature, Methods of preparation of alkyl halides, Physical properties, Optical isomerism in halogen derivatives, Chemical properties, Uses and environmental effects of some polyhalogen compounds.
11.Alcohols, Phenols and Ethers	Classification, Nomenclature, Methods of preparation, Physical properties, Chemical properties, Uses
12.Aldehydes, Ketones, Carboxylic Acids	Classification, Nomenclature, Methods of preparation, Physical properties, Chemical properties
13.Amines	Classification, Nomenclature, Methods of preparation, Physical properties, Chemical properties
14.Biomolecules	Carbohydrates: Classifications, Nomenclature of monosaccharides, Preperation of Glucose, Structure and properties of Glucose. Proteins: alpha amino acids, Types of proteins, Structure of proteins, Denaturation of Proteins. Enzymes:Mechanism of enzyme catalysis. Nucleic acids.
15.Introduction to Polymer Chemistry	Classification of polymers, Some important polymer, Molecular mass and degree of polymerization of polymer, Biodegeradable Polymers, Commercially important polymers.
16.Green Chemistry and	Introduction, Sustainable development, Principle of green chemistry, Roll of Green chemistry, Introduction to

Nanochemistry	nanochemistry, Characteristic features of nanoparticles, synthesis of nanomaterial, History of nanotechnology, Application of nanomaterials, Nanoparticles and nanotechnology.

XI BIOLOGY

1. Living World	Basic Principles of Life, Herbarium, Botanical Gardens, Museum, Zoological Parks, Biodiversity Parks, Key
2. Systematics of Living Organisms	Classification, Three domains of life, Chemotaxonomy, Numerical Taxonomy, Cladogram, Phylogeny, DNA Bar coding, Taxonomic Categories, Taxonomic Hierarchy, Units of Classification, Nomenclature, Salient Features of Five Kingdoms, Acellular Organisms (Viruses, Viroids, Lichens)
3. Kingdom Plantae	Kingdom Plantae Classification, Salient features of major plant groups under Cryptogams and Phanerogams, Plant life cycle and Alternation of generations
4. Kingdom Animalia	Criterion used for animal classification, Animal body plan, Animal Classification and Phylums
5. Cell structure and organization	Cell, Kinds of Cells, Procaryotic cells, Eucaryotic cell and its components
6. Biomolecules	Carbohydrates, Lipids, Proteins, Nucleic acids and their significance, Enzymes and their properties, Nomenclature, Mechanism of Enzyme action. Concept of metabolism
7. Cell Division	Cell Cycle, Types of Cell Division-Amitosis, Mitosis, Meiosis and their significance
8. Plant Tissue and Anatomy	Tissue, Meristematic tissue, Simple and Permanent Tissues, Tissue Systems, Secondary growth in plants, Wood, Cork cambium and secondary growth, Anatomy of Dicot and Monocot, root stem and leaf

9. Morphology of Flowering Plants	Classification of Flowering plants, Root, Stem, Leaf their structure and modifications, Inflorescence, Structure of Flower, Placentation, Fruit and Seed. Study of some important families : Fabaceae and Solanaceae
10. Animal Tissues	Histology and Types : Epithelial, Connective, Muscular and Nervous Tissue
11. Study of Animal Type- Cockroach	Habit and habitat, Systematic Position, External morphology, Body Cavity, Digestive System of cockroach, Circulatory or Blood vascular system, Respiratory System, Nervous System, Reproductive system, Interactions with mankind
12. Photosynthesis	Meaning, Chloroplasts, Nature of Light, Mechanism of Photosynthesis, Light Reaction, Photophosphorylation, Dark reaction, Photorespiration, C_4Pathway, Crassulacean Acid Metablism, Factors affecting Photosynthesis, Significance
13. Respiration and Energy Transfer	Formation of ATP, Anaerobic respiration, Glycolysis, Aerobic respiration, Krebs Cycle, ETS, Significance
14. Human Nutrition	Meaning, Human Digestive System, Digestive glands, Physiology of Digestion, Absorption assimilation and egestion, Nutritional disorders and disorders of digestive system
15. Excretion and Osmoregulation	Excretion and excretory products, Two Major types of Nephridia, Excretory system in Human being, Physiology of Urine formation, Composition of Urine, Role of skin in excretion, Disorders and Diseases, Dialysis
16. Skeleton and Movements	Movements and Locomotion, Location ,structure and working of Skeletal muscles, Structure of myosin and

	actin filaments, mechanism of muscle contraction, Physiology of muscle relaxation, Properties of muscles on electrical stimulation, Skeletal System, Group of Skeleton : Axial and Appendicular Skeleton, Types of Joints, Disorders related to muscles and bones

XII BIOLOGY

1. Reproduction in Lower and Higher Plants	Asexual Reproduction, Sexual Reproduction, Microsporogenesis, Structure of Ovule, Megasporogenesis, Polynation, Outbreeding devices, Double Fertilization, Post fertilization changes, ApomixisParthenocarpy
2. Reproduction in Lower and Higher Animals	Asexual Reproduction, Sexual Reproduction, Human Reproductive Systems, Puberty, Menstrual Cycle, Gametogenesis: Spermatogenesis, Oogenesis, Fertilization, Embryonic Development, Placenta, Parturition, Lactation, Birth Control Methods, Amniocentesis, Sexually Transmitted Diseases (STD), Infertility and Treatment, Adoption
3. Inheritance and Variation	Chromosomes and Mechanism of Inheritance, Genetic Terminology, Mendel's Laws of Inheritance, Back Cross and Test Cross, Deviations, Chromosomal Theory of Inheritance, Chromosomes, Linkage and Crossing over, Autosomal Inheritance, Sex Link Inheritance and Diseases, Sex determination, Genetic Disorders
4. Molecular Basis of Inheritance	The Discovery of DNA, The Genetic Material is a DNA, DNA Packaging, DNA Replication, Protein Synthesis, Genetic Code, Regulation of Gene Expression, Operon Concept, Genomics, Human Genome Project, DNA Fingerprinting

5. Origin and Evolution of Life	Protobiogenesis, Chemical Evolution of Life, Organic Evolution, Darwinism, Mutation Theory, Modern Synthetic Theory of Evolution, Mechanism of Organic Evolution, Hardy-Weinberg's Principle, Adaptive Radiation, Evidences of Organic Evolution, Speciation, Geological Time Scale, Human Evolution
6. Plant Water Relation	Properties of Water, Water absorbing Organ, Availability and absorption of water by roots from soil, Water Potential(ψ), Plasmolysis, Path of water across the root, Mechanism of absorption of water, Ascent of Sap, Transport of mineral ions, Transport of food, Transpiration, Structure of Stomatal apparatus, Significance of Transpiration
7. Plant Growth and Mineral Nutrition	Meaning, Phases of Growth, Conditions for Growth, Growth Rate and Types of Growth, Growth Curve, Differentiation, De-Differentiation, Re-Differentiation, Development, Plasticity, Growth Hormones: Physiological Effects and Applications, Photoperiodism, Vernalization, Mineral Nutrition : Classification and Role of Mineral Elements in Plants, Nitrogen Cycle
8. Respiration and Circulation	Meaning, Organs of Respiratory exchange in plants and animals, Human Respiratory System, Mechanism of Respiration, Regulation of Breathing, Common disorders of Respiratory system, Transportation in Living Organisms, Circulation in animals, Human Circulatory system : Blood and its components, Heart: External and Internal Structure, Conducting system of Heart, Mechanism of working of human heart, Blood Vessels, Blood Pressure, Heart Diseases, ECG, Lymphatic system
9. Control and Co-ordination	Nervous Co-ordination : Nervous system in *Hydra*, *Planaria.* Neural Tissue, Synapse, Transmission of nerve

	impulse. Human Nervous System: Central Nervous System (CNS), Peripheral Nervous System(PNS), Autonomous Nervous System(ANS). Sensory Receptors, Eye, Ear, Disorders of Nervous System, Chemical Co-ordination, Endocrine System: Hormones, Properties, Mechanism of Hormone Action. Major Endocrine Glands, Hormones, Mode of Action, Disorders
10. Human Health and Diseases	Immunity and its types, Cells of Immune System, Vaccination, Structure of Antibody, Formation of antigen-antibody complex, ABO blood groups and Rh factor, Common Human Diseases: Mode of Transmission, Symptoms, Diagnosis and Treatment, Prevention and Control, Adolescence, Mental Health and Adolescence, Addiction, Drug Abuse, Effects of Drugs, Prevention and Control
11. Enhancement of Food Production	Improvement in Food Production, Plant Breeding, Tissue Culture, Single Cell Protein (SCP), Biofortification, Animal Husbandry: Management of Farm and Farm Animals, Dairy Farm Management, Poultry Farm Management, Apiculture or Bee Keeping, Fishery, Lac Culture. Microbes in Human Welfare: Microbes in Food Production, Role of Microbes in Industrial Production, Microbes in Sewage Treatment, Microbes in Energy Generation, Role of microbes as biocontrol agents and biofertilizers
12. Biotechnology	Meaning, Principles and Processes of Biotechnology: Technique of Gene Cloning and rDNA Technology, Methodology for rDNA Technology, Applications of Biotechnology: Healthcare, Agriculture, Gene Therapy, Genetically Modified Organisms(GMOs), Advantages of GM food-plants. Bioethics :Effects of Biotechnology on Environment and Human Health.Bio-piracy and Bio-

	patent
13. Organisms and Populations	Organisms and the environment around, Major abiotic factors, Adaptation, Population, Population Interactions,
14. Ecosystems and Energy Flow	Ecosystems : Structure and Function. Energy Flow, Ecological Pyramids, Nutrient Cycles: Carbon and Phosphorous Cycle. Ecological Succession
15. Biodiversity, Conservation and Environmental Issues	Definition of Biodiversity, Levels of Biodiversity, Biodiversity current scenario, Loss of Biodiversity, Causes of Biodiversity Losses, IUCN System and Categories, Conservation of Biodiversity, Biological Diversity Act 2002, Environmental Issues: Air, Noise, Water Pollution, Its Causes, Effects and Control Measures, Green House Effect and Global Warming, Ozone Depletion, Deforestation, Conservation of Forests, Mission Harit Maharashtra