SYLLABUS FOR (B.SC. NURSING)

A. PHYSICS

UNIT 1: Units and Measurements
Units of measurements, System of units, SI Units, fundamental and derived units, least count, significant figures, Errors in measurements. Dimensions of Physics quantities, dimensional analysis and its applications.

UNIT 2: Kinematics
The frame of reference, motion in a straight line, speed and velocity, uniform and non-uniform motion, average speed and instantaneous velocity, uniformly accelerated motion, velocity-time, position-time graph, relations for uniformly accelerated motion, relative velocity. Motion in a plane, projectile motion, uniform circular motion.

UNIT 3: Laws of Motion
Force and inertia, Newton's first law of motion, momentum, 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.
Dynamics of uniform circular motion, centripetal force and its applications: vehicle on a level circular road, vehicle on a banked road.

UNIT 4: Work, Energy and Power
Work done by a constant force and a variable force, kinetic and potential energies, work-energy theorem, power.
The potential energy of a spring, conservation of mechanical energy, conservative and non- conservative forces, motion in a vertical circle. Elastic and inelastic collisions in one and two dimensions.

UNIT 5: Rotational Motion
Centre of mass of a two-particle system, centre of mass of a rigid body. Basic concepts of rotational motion, moment of a force, torque, angular momentum, conservation of angular momentum and its applications.
The moment of inertia, the radius of gyration, values of moments of inertia for simple geometrical objects, parallel and perpendicular axes theorems and their applications. Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions.

UNIT 6: Gravitation
The universal law of gravitation. Acceleration due to gravity and its variation with altitude and depth. Kepler's law of planetary motion. Gravitational potential energy, gravitational potential. Escape velocity, motion of a satellite, orbital velocity, time period and energy of satellite.

UNIT 7: Properties of Solids and Liquids
Elastic behaviour, stress-strain relationship, Hooke's Law, Young's modulus, bulk modulus and modulus of rigidity. Pressure due to a fluid column, Pascal's law and its applications, effect of gravity on fluid pressure, viscosity, Stoke's law, terminal velocity, streamline and turbulent flow, critical velocity, Bernoulli's principle and its applications. Surface energy and surface tension, angle of contact, excess of pressure across a curved surface, application of surface tension: drops, bubbles and capillary rise.
Heat, temperature, thermal expansion, specific heat capacity, calorimetry, change of state, latent heat. Heat transfer: conduction, convection and radiation.

UNIT 8: Thermodynamics
Thermal equilibrium and the concept of temperature, zeroth law of thermodynamics, heat, work and internal energy. The first law of thermodynamics, isothermal and adiabatic processes. The second law of thermodynamics: reversible and irreversible processes.

UNIT 9: Kinetic Theory of Gases
Equation of state of a perfect gas, work done on compressing a gas, kinetic theory of gases: assumptions, the concept of pressure, kinetic interpretation of temperature, RMS speed of gas molecules, degrees of freedom, law of equipartition of energy and applications to specific heat capacities of gases, mean free path, Avogadro's number.

UNIT 10: Oscillations and Waves
Oscillations and periodic motion: time period, frequency, displacement as a function of time, periodic functions. Simple harmonic motion (S.H.M.) and its equation, phase, oscillations of a spring: restoring force and force constant, energy in S.H.M.: kinetic and potential energies, simple pendulum: derivation of expression for its time period. Wave motion, longitudinal and transverse waves, speed of the travelling wave, 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.

UNIT 11: Electrostatics
Electric charges: conservation of charge, Coulomb's law forces 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, Gauss's law and its applications to find field due to infinitely long uniformly charged straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell.
Electric potential and its calculation for a point charge, electric dipole and system of charges, potential difference, equipotential surfaces, electrical potential energy of a system of two point charges and of electric dipole in an electrostatic field.
Conductors and insulators, dielectrics and electric polarization, capacitors and capacitance, the combination of capacitors in series and parallel and capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor.

UNIT 12: Current Electricity
Electric current: drift velocity, mobility and their relation with electric current, Ohm's law, electrical resistance, I-V characteristics of Ohmic and non-ohmic conductors, electrical energy and power, electrical resistivity and conductivity, series and parallel combinations of resistors, temperature dependence of resistance.
Internal resistance, potential difference and emf of a cell, a combination of cells in series and parallel.
Kirchhoff's laws and their applications, Wheatstone bridge, Metre Bridge.

UNIT 13: Magnetic Effects of Current and Magnetism
Biot - Savart law and its application to the current carrying circular loop, Ampere's law and its applications to infinitely long current carrying straight wire and solenoid.
Force on a moving charge in uniform magnetic and electric fields, force on a current-carrying conductor in a uniform magnetic field, the force between two parallel currents carrying conductors-definition of ampere, torque experienced by a current loop in a uniform magnetic field: Moving coil galvanometer, its sensitivity and conversion to ammeter and voltmeter.
Current loop as a magnetic dipole and its magnetic dipole moment, bar magnet as an equivalent solenoid, magnetic field lines, magnetic field due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis, torque on a magnetic dipole in a uniform magnetic field, para-, dia- and ferromagnetic substances with examples, the effect of temperature on magnetic properties.

UNIT 14: Electromagnetic Induction and Alternating Currents
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, LCR series circuit, resonance, power in AC circuits, wattless current, AC generator and transformer.

UNIT 15: Electromagnetic Waves
Displacement current, electromagnetic waves and their characteristics, transverse nature of electromagnetic waves, electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, Gamma rays), applications of electromagnetic waves.

UNIT 16: Optics
Reflection of light, spherical mirrors, mirror formula. Refraction of light at plane and spherical surfaces, thin lens formula and lens maker formula, total internal reflection and its applications, magnification, power of a lens, combination of thin lenses in contact, refraction of light through a prism, microscope and astronomical telescope

(reflecting and refracting) and their magnifying powers.
Wave optics: wavefront and Huygens 'Principle, laws of reflection and refraction using Huygens principle. Interference: Young's double-slit experiment and expression for fringe width, coherent sources and sustained interference of light. Diffraction due to a single slit, width of central maximum. Polarization: plane-polarized light, Brewster's law, uses of plane- polarized light and Polaroid.

UNIT 17: Dual Nature of Matter and Radiation

Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations, Einstein's photoelectric equation, particle nature of light. Matter waves: wave nature of particle, de- Broglie relation.

UNIT 18: Atoms and Nuclei

Alpha-particle scattering experiment, Rutherford's model of atom, Bohr model, energy levels, hydrogen spectrum. Composition and size of nucleus, atomic masses, mass-energy relation, mass defect, binding energy per nucleon and its variation with mass number, nuclear fission and fusion.

UNIT 19: Electronic Devices

Semiconductors, semiconductor diode: I-V characteristics in forward and reverse bias, diode as a rectifier; I-V characteristics of LED, the photodiode, solar cell, Zener diode, Zener diode as a voltage regulator.
Logic gates (OR. AND. NOT. NAND and NOR).

UNIT 20: Experimental Skills

Familiarity with the basic approach and observations of the experiments and activities:

19. Vernier calipers -its use to measure the internal and external diameter and depth of a vessel.
20. Screw gauge-its use to determine the thickness/ diameter of thin sheet/wire.
21. Simple pendulum-dissipation of energy by plotting a graph between the square of amplitude and time.
22. Metre scale - the mass of a given object by the principle of moments.
23. Young's modulus of elasticity of the material of a metallic wire.
24. Surface tension of water by capillary rise and effect of detergents,
25. Co-efficient of viscosity of a given viscous liquid by measuring the terminal velocity of a given spherical body.
26. Speed of sound in air at room temperature using a resonance tube,
27. Specific heat capacity of a given (i) solid and (ii) liquid by method of mixtures.
28. The resistivity of the material of a given wire using a metre bridge.
29. The resistance of a given wire using Ohm's law.
30. Resistance and figure of merit of a galvanometer by half deflection method.
31. The focal length of
    (i) Convex mirror
    (ii) Concave mirror and
    (iii) Convex lens, using the parallax method.
32. The plot of the angle of deviation vs angle of incidence for a triangular prism.
33. The refractive index of a glass slab using a travelling microscope.
34. Characteristic curves of a p-n junction diode in forward and reverse bias.
35. Characteristic curves of a Zener diode and finding reverse breakdown voltage.
36. Identification of diode, LED, resistor, a capacitor from a mixed collection of such items

B. CHEMISTRY

PHYSICAL CHEMISTRY

UNIT I: SOME BASIC CONCEPTS IN CHEMISTRY

Matter and its nature, Dalton's atomic theory, Concept of atom, molecule, element and compound, Laws of chemical combination, Atomic and molecular masses, mole concept, molar mass, percentage composition, empirical and molecular formulae, Chemical equations and stoichiometry.

UNIT 2: ATOMIC STRUCTURE

Nature of electromagnetic radiation, photoelectric effect, spectrum of the hydrogen atom, Bohr model of a hydrogen atom - its postulates, derivation of the relations for the energy of the electron and radii of the different orbits,

limitations of Bohr's model, dual nature of matter, de Broglie's relationship, Heisenberg uncertainty principle, elementary ideas of quantum mechanics, the quantum mechanical model of the atom and its important features, concept of atomic orbitals as one-electron wave functions, variation of and ^{2} with r for 1s and 2s orbitals, various quantum numbers (principal, angular momentum and magnetic quantum numbers) and their significance, shapes of s, p and d - orbitals, electron spin and spin quantum number, rules for filling electrons in orbitals – Aufbau principle, Pauli's exclusion principle and Hund's rule, electronic configuration of elements and extra stability of half-filled and completely filled orbitals.

UNIT 3: CHEMICAL BONDING AND MOLECULAR STRUCTURE

Kossel-Lewis approach to chemical bond formation, the concept of ionic and covalent bonds.

Ionic Bonding: Formation of ionic bonds, factors affecting the formation of ionic bonds; calculation of lattice enthalpy.

Covalent Bonding: Concept of electronegativity, Fajan's rule, dipole moment, Valence Shell Electron Pair Repulsion (VSEPR) theory and shapes of simple molecules.

Quantum mechanical approach to covalent bonding: Valence bond theory - its important features, the concept of hybridization involving s, p and d orbitals, resonance.

Molecular Orbital Theory - Its important features, LCAOs, types of molecular orbitals (bonding, antibonding), sigma and pi-bonds, molecular orbital electronic configurations of homonuclear diatomic molecules, the concept of bond order, bond length and bond energy.

Elementary idea of metallic bonding, hydrogen bonding and its applications.

UNIT 4: CHEMICAL THERMODYNAMICS

Fundamentals of thermodynamics: System and surroundings, extensive and intensive properties, state functions, entropy, types of processes.

The first law of thermodynamics - Concept of work, heat, internal energy and enthalpy, heat capacity, molar heat capacity, Hess's law of constant heat summation, Enthalpies of bond dissociation, combustion, formation, atomization, sublimation, phase transition, hydration, ionization and solution.

The second law of thermodynamics - Spontaneity of processes, ΔS of the universe and ΔG of the system as criteria for spontaneity. ΔG°(Standard Gibbs energy change) and equilibrium constant.

UNIT 5: SOLUTIONS

Different methods for expressing the concentration of solution - molality, molarity, mole fraction, percentage (by volume and mass both), the vapour pressure of solutions and Raoult's Law - Ideal and non- ideal solutions, vapour pressure - composition, plots for ideal and non- ideal solutions, Colligative properties of dilute solutions - a relative lowering of vapour pressure, depression of freezing point, the elevation of boiling point and osmotic pressure, determination of molecular mass using colligative properties, abnormal value of molar mass, van't Hoff factor and its significance.

UNIT 6: EQUILIBRIUM

Meaning of equilibrium is the concept of dynamic equilibrium.

Equilibria involving physical processes: Solid-liquid, liquid-gas, gas-gas and solid-gas equilibria, Henry's law. General characteristics of equilibrium involving physical processes.

Equilibrium involving chemical processes: Law of chemical equilibrium, equilibrium constants (K_p and K_c) and their significance, the significance of ΔG and ΔG° in chemical equilibrium, factors affecting equilibrium concentration, pressure, temperature, the effect of catalyst, Le Chatelier's principle.

Ionic equilibrium: Weak and strong electrolytes, ionization of electrolytes, various concepts of acids and bases (Arrhenius, Bronsted - Lowry and Lewis) and their ionization, acid-base equilibria (including multistage ionization) and ionization constants, ionization of water, pH scale, common ion effect, hydrolysis of salts and pH of their solutions, the solubility of sparingly soluble salts, solubility products and buffer solutions.

UNIT 7: REDOX REACTIONS AND ELECTROCHEMISTRY

Electronic concepts of oxidation and reduction, redox reactions, oxidation number, rules for assigning oxidation number and balancing of redox reactions.

Electrolytic and metallic conduction, conductance in electrolytic solutions, molar conductivities and their variation with concentration, Kohlrausch's law and its applications.

Electrochemical cells - Electrolytic and Galvanic cells, different types of electrodes, electrode potentials including

standard electrode potential, half-cell and cell reactions, emf of a Galvanic cell and its measurement, Nernst equation and its applications, relationship between cell potential and Gibbs' energy change, dry cell and lead accumulator, fuel cells.

UNIT 8: CHEMICAL KINETICS
Rate of a chemical reaction, factors affecting the rate of reactions: concentration, temperature, pressure and catalyst, elementary and complex reactions, order and molecularity of reactions, rate law, rate constant and its units, differential and integral forms of zero and first-order reactions, their characteristics and half-lives, the effect of temperature on the rate of reactions, Arrhenius theory, activation energy and its calculation, collision theory of bi-molecular gaseous reactions (no derivation).

INORGANIC CHEMISTRY

UNIT 9: CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES
Modern periodic law and present form of the periodic table, s, p. d and f block elements, periodic trends in properties of elements atomic and ionic radii, ionization enthalpy, electron gain enthalpy, valence, oxidation states and chemical reactivity.

UNIT 10: p- BLOCK ELEMENTS
Group -13 to Group 18 Elements
General Introduction: Electronic configuration and general trends in physical and chemical properties of elements across the periods and down the groups, unique behaviour of the first element in each group.

UNIT 11: d - and f- BLOCK ELEMENTS
Transition Elements - General introduction, electronic configuration, occurrence and characteristics, general trends in properties of the first-row transition elements - physical properties, ionization enthalpy, oxidation states, atomic radii, colour, catalytic behaviour, magnetic properties, complex formation, interstitial compounds, alloy formation, preparation, properties and uses of $K_2Cr_2O_7$ and $KMnO_4$.
Inner Transition Elements
Lanthanoids - Electronic configuration, oxidation states and Lanthanoid contraction.

Actinoids - Electronic configuration and oxidation states.

UNIT 12: COORDINATION COMPOUNDS
Introduction to coordination compounds. Werner's theory, ligands, coordination number, denticity, chelation, IUPAC nomenclature of mononuclear co-ordination compounds, isomerism, Bonding: Valence bond approach and basic ideas of Crystal field theory, colour and magnetic properties, importance of coordination compounds (in qualitative analysis, extraction of metals and in biological systems).

ORGANIC CHEMISTRY

UNIT 13: PURIFICATION AND CHARACTERISATION OF ORGANIC COMPOUNDS
Purification - Crystallization, sublimation, distillation, differential extraction and chromatography - principles and their applications.
Qualitative analysis - Detection of nitrogen, sulphur, phosphorus and halogens.
Quantitative analysis (basic principles only) - Estimation of carbon, hydrogen, nitrogen, halogens, sulphur and phosphorus.
Calculations of empirical formulae and molecular formulae, numerical problems in organic quantitative analysis,

UNIT 14: SOME BASIC PRINCIPLES OF ORGANIC CHEMISTRY
Tetravalency of carbon, shapes of simple molecules - hybridization (s and p): classification of organic compounds based on functional groups and those containing halogens, oxygen, nitrogen and sulphur, homologous series: Isomerism - structural and stereoisomerism.
Nomenclature (Trivial and IUPAC)
Covalent bond fission - Homolytic and heterolytic, free radicals, carbocations and carbanions, stability of carbocations and free radicals, electrophiles and nucleophiles.

Electronic displacement in a covalent bond
- Inductive effect, electromeric effect, resonance and hyperconjugation.
Common types of organic reactions- Substitution, addition, elimination and rearrangement.

UNIT 15: HYDROCARBONS
Classification, isomerism, IUPAC nomenclature, general methods of preparation, properties and reactions.
Alkanes - Conformations: Sawhorse and Newman projections (of ethane), mechanism of halogenation of alkanes.
Alkenes - Geometrical isomerism, mechanism of electrophilic addition, addition of hydrogen, halogens, water, hydrogen halides (Markownikoffs and peroxide effect), Ozonolysis and polymerization.
Alkynes - Acidic character, addition of hydrogen, halogens, water and hydrogen halides, polymerization.
Aromatic hydrocarbons - Nomenclature, benzene - structure and aromaticity, mechanism of electrophilic substitution, halogenation, nitration.

Friedel-Craft's alkylation and acylation, directive influence of the functional group in mono- substituted benzene.
UNIT 16: ORGANIC COMPOUNDS CONTAINING HALOGENS
General methods of preparation, properties and reactions, nature of C-X bond, mechanisms of substitution reactions.
Uses, environmental effects of chloroform, iodoform, freons and DDT.

UNIT 17: ORGANIC COMPOUNDS CONTAINING OXYGEN
General methods of preparation, properties, reactions and uses.

ALCOHOLS, PHENOLS AND ETHERS
Alcohols: Identification of primary, secondary and tertiary alcohols, mechanism of dehydration.
Phenols: Acidic nature, electrophilic substitution reactions, halogenation, nitration and sulphonation, Reimer - Tiemann reaction.
Ethers: Structure.
Aldehyde and Ketones: Nature of carbonyl group, nucleophilic addition to >C=O group, relative reactivities of aldehydes and ketones, important reactions such as - Nucleophilic addition reactions (addition of HCN, NH_3 and its derivatives), Grignard reagent, oxidation, reduction (Wolf Kishner and Clemmensen), the acidity of -hydrogen. Aldol condensation, Cannizzaro reaction, Haloform reaction, chemical tests to distinguish between aldehydes and ketones.
Carboxylic Acids: Acidic strength and factors affecting it.

UNIT 18: ORGANIC COMPOUNDS CONTAINING NITROGEN
General methods of preparation, properties, reactions and uses.
Amines: Nomenclature, classification, structure, basic character and identification of primary, secondary and tertiary amines and their basic character.
Diazonium Salts: Importance in synthetic organic chemistry.

UNIT 19: BIOMOLECULES
General introduction and importance of biomolecules.
CARBOHYDRATES – Classification, aldoses and ketoses, monosaccharides (glucose and fructose) and constituent monosaccharides of oligosaccharides (sucrose, lactose and maltose).
PROTEINS - Elementary idea of -amino acids, peptide bond, polypeptides, proteins: primary, secondary, tertiary and quaternary structure (qualitative idea only), denaturation of proteins, enzymes.
VITAMINS – Classification and functions.
NUCLEIC ACIDS – Chemical constitution of DNA and RNA, biological functions of nucleic acids.
Hormones (General introduction)

UNIT 20: PRINCIPLES RELATED TO PRACTICAL CHEMISTRY
Detection of extra elements (Nitrogen, sulphur, halogens) in organic compounds, detection of the following functional groups, hydroxyl (alcoholic and phenolic), carbonyl (aldehyde and ketones) carboxyl and amino groups in organic compounds.

- The chemistry involved in the preparation of the following:

- Inorganic compounds, Mohr's salt, potash alum.
- Organic compounds: Acetanilide, p-nitro acetanilide, aniline yellow, iodoform.
- The chemistry involved in the titrimetric exercises – acids, bases and the use of indicators, oxalic-acid vs $KMnO_4$, Mohr's salt vs $KMnO_4$
- Chemical principles involved in the qualitative salt analysis: Cations –

  Pb^{2+}, Cu^{2+}, Al^{3+}, Fe^{3+}, Zn^{2+}, Ni^{2+}, Ca^{2+}, Ba^{2+}, Mg^{2+}, NH_4^+

- Anions- CO_3^{2-}, S^{2-}, SO_4^{2-}, NO_3^-, NO_2^-, Cl^-, Br^-, I^- (Insoluble salts excluded).

Chemical principles involved in the following experiments:

- Enthalpy of solution of $CuSO_4$
- Enthalpy of neutralization of strong acid and strong base.
- Preparation of lyophilic and lyophobic sols.

Kinetic study of the reaction of iodide ions with hydrogen peroxide at room temperature

C. BIOLOGY

III. BOTANY

UNIT–I: HISTORY
History, botanical studies, branches of botany, brief classification of plant kingdom. Scope of Botany, cell Biology, cell theory.

UNIT–II: PLANT CELL
Structure of typical plant cell, cell wall and cell membrane, protoplasm - physical and chemical nature, cell organelle - structure and functions, nucleus, Iysosomes, golgi bodies, plastids, ribosomes, mitochondria, chromosomes, spherosomes, Important compounds of cell, water, amino acids, carbohydrates, fats, nucleotides, nucleic acids. Cell inclusions, physical and chemical nature and functions of enzymes, vitamins and hormones, mode of enzyme action, cell cycle, Mitosis; Meiosis.

UNIT–III: COMPLEXITIES OF PLANT LIFE
Meristematic tissues, permanent, simple and complex tissues, Internal structure of dicot and monocot systems and roots, Internal structure of Isobilateral and Dorsiventral with functions of different tissues, Normal, secondary growth in dicot stems.

UNIT–IV: MORPHOLOGY OF ANGIOSPERMS
Normal and Modified stems, roots and leaves, Inflorescence, Flower and its parts, floral diagram and floral formula, pollination, fertilization, fruits.

UNIT–V: TAXONOMY OF FLOWERING PLANTS
Principle and units of classification (species, genus, family), knowledge of important families and their economic importance.

UNIT–VI: CONTINUITY OF PLANT LIFE
Genetics (elementary knowledge), mitosis and meiosis and their significance, principle of Mendel's law of inheritance, monohybrid and dihybrid ratio, concept of gene, elementary idea of gene action, evolution, evidence, theories and mechanism of evolution, variation and mutation, role of mutation in agriculture, origin of species.

UNIT–VII: MICROORGANISMS AND DIVERSITIES OF PLANT LIFE
Elementary idea and economic importance of virus, bacteria, fungi, algae and lichen, elementary idea of gryophytes,

pterodophytes and gymnosperms.

UNIT–VIII: PROCESSES IN PLANTS
Absorption and transport of water and minerals, transpiration, stomatal mechanism, life energy and ATP, respiration and fermentation, photosynthesis, elementary idea of protein synthesis, growth, reproduction, movements (with special reference to geotrposim and phototropism).

UNIT–IX: ENVIRONMENTAL BIOLOGY
Man and his environment, biotic community, ecological adaptations (hydrophytes and xerophytes).

UNIT–X: BOTANY AND HUMAN WELFARE
Agricultural crops - Brief description and economic importance of crop plants like rice, gram (green gram) Jute, groundnut, sugarcane, and potato.

UNIT–XI: COMMON PLANT DISEASES
control of blight in rice, rot of sugarcane, forestry, genetic conservation and crop improvement.

UNIT–XII: GENETIC ENGINEERING AND BIOTECHNOLOGY
Recombinant DNA, gene library, transgenic plants, fermentation, bakery, antibiotics, monochloral antibodies.

IV. ZOOLOGY

UNIT–I: ANIMAL WORLD
Definition, scope and branch of zoology. Species concept, bionomical nomenclature, classification, scientific name of some common animals: Fishes-rohu, bhakura, mrigal, Amphibians-frog, toad, Reptiles-houselizard, garden lizard, crocodile, turtle, snakes-cobra, krait, birds-fowl. peacock, pigeon, mammals-tiger, lion, elephant, cat, dog, cow, rabbit & man.

UNIT–II: DIVERSITY OF LIFE: KINGDOM-PROTASIA
General characters of the phylum, protozoa, Classification - amoeba, entamoeba, paramoecium, euglena, trypanosoma, plasmodium.

Kingdom-animalia: Concept of body plan, symmetry, coelom, germ layershomeothermic and poikilothermic animals.
General characters of Non-chordata like - porifera, coelenterata, platy helminthes, nematahelminthes, annelida, arthopoda, mollusca, echinodermata & hemichrhordata.

UNIT–III: MULTI CELLULARITY IN ANIMALS
Animal tissues - Types- epithelial, connective (details about blood and lymph), muscular & nervous- organs & organ systems.

UNIT–IV: LOCOMOTION
Locomotory organelles in protozoans, hydra, annelid, brief account of joints and muscles in movement of man, modes of nutrition - Nutrition in amoeba.
Digestive system of man - Structure and function of alimentary canal associated glands, physiology of digestion and absorption.

UNIT–V: TYPES OF RESPIRATION
Structure and function of respiratory system in man: Respiratory organs, mechanics of pulmonary resipiration, plunomary exchange of gas, transport of gases, glycolysis & Kreb's cycle, respiratory quotient.
Unit–VI: Digestive System Organs, Digestion & absorption.

UNIT–VII: TYPES OF CIRCULATION
Open circulation, closed circulatory system in man: Structure of Heart, cardiac cycle, arteries, veins, capillaries, portal system, coronary circulation, blood pressure, respiratory pigments, group and coagulation.

UNIT–VIII: EXCRETORY REPRODUCTION IN MAN
Structure and function of kidney.

UNIT–IX: CONTROL AND COORDINATION IN MAN
Nervous system-central, peripheral and autonomic sense organs, endocrine system, Mechanism of Hormone action.

UNIT–X: TYPES OF REPRODUCTION
Asexual, binary & multiple fission, budding, cellular growth, re-generation, ageing. **Sexual reproduction in man -** male & female reproductive system, menstrual cycle.

UNIT–XI: GENETICS
Chromosomes and heredity: heredity and viriation, mendelian principle, laws of heredity, chromosomes, Interaction of genes, chromosomal variation.

UNIT–XII: EVOLUTION
Origin of life Anatomical, embryological biochemical, palaentological, and biogeographical evidences of evolutions, Darwin's theory of natural selection, modern synthetic theory.

UNIT–XIII: ENVIRONMENTAL BIOLOGY
Meaning of ecology environment, habitat and niche, biosphere and ecosystem, ecological adaptations, biodiversity. **Environmental Pollution -** Source, effects and control of air, water and sound pollution, deforestation, global warming, climate change.

UNIT–XIV: COMMON HUMAN DISEASE
Non communicable diseases - Diabetes & cardiac diseases. Communicable diseases like, amoebiasis, filariasis, malaria (Mode of inflection- pathogens, prevention and treatment).

UNIT – XV: DEFENCE MECHANISM OF BODY
Cells, Immune system and their function, immune deficiency in AIDS.

UNIT – XVI: WILDLIFE CONSERVATION
Importance of wildlife, Causes of extinction, threatened species - endangered, vulnerable and rare species, conservation of wild life.

Section	No. of Questions
Aptitude for Nursing	12
Physics	12
Chemistry	12
Biology	12
English	12