

SESSION	2018-19
CLASS	B.Sc. BIOCHEMISTRY (HONS.)
SEMESTER	I
PEPER	H-I
TITLE OF THE PAPER	Biochemistry
Max.	70

Unit –I: Carbohydrates

Introduction and Biological importance of carbohydrates, Classification, Isomerism, Physical and Chemical properties of carbohydrates, Concept of Chiral carbon, Stereo isomers, Optical isomers, Mutarotation, D & L forms, Boat and chair forms, Haworth perspective formulas, Disaccharides (Reducing and Non, Polysaccharides (Homopolysaccharides, Heteropolysaccharides & Mucopolysaccharides)

Unit – II: Lipids

Introduction and Biological importance of Lipids, Classification, Simple Lipids- fatty acids (Saturated, Unsaturated, Branched and Cyclic fatty acids), Essential fatty acids, Physical & Chemical properties, Saponification value, Acid Value, Rancidity, Compound lipids, Derived lipids, Cholesterol and other sterols.

Unit – III: Proteins

Introduction and biological importance of proteins. Amino Acids, types, Structures and Physical and Chemical properties, Essential amino acids, acid-Base behavior, Zwitter ion, Isoelectric pH, Colour, reactions of amino acids, Classification of Proteins, Peptide Bond, Primary, secondary, tertiary and Quaternary Structures of Proteins, denaturation, renaturation.

Unit – IV: Nucleic Acids

Introduction and Biological importance of Nucleic Acids, Physical and chemical properties, Structural organization and occurrence in the cell, nucleotides, nucleosides, types of nucleic Acids DNA & RNA, Watson-Crick Model, types and functions of DNA and RNA.

Unit – V: Vitamins

Introduction and Biological importance of Vitamins, Water soluble Vitamins, their occurrence, properties, functions and diseases, Fat soluble Vitamins, their occurrence, properties, functions and diseases.

SESSION	2018-19
CLASS	B.Sc. BIOCHEMISTRY (HONS.)
SEMESTER	I
PEPER	H-2
TITLE OF THE PAPER	Chemistry I
Max.	70

Unit – I

Acid-Base concept, Lewis acids-bases, Bronsted Lowry theory, Hydrogen ion concentration, Ionization, pH, Buffers, Biological buffers, Handerson-Haselbalch equation, Measurement of pH, Water structure, Hydrogen bonding.

Unit – II: Solution

Ideal and non ideal solution, different methods of concentration expression, Rault's Law, Classification of colloids, properties of colloids, Donnan-Membrane equilibrium, Factors affecting Viscosity, Significance of viscosity in Biological system.

Unit – III: Chemical Bond

Types of chemical bond: ionic compounds, covalent bonds, co-ordinate compounds, Shapes of orbital, Valence Bond Theory, Molecular Orbital Theory, VSEPR theory, Structure of different molecules, Bond length, Bond angle and bond energy, Conventional bonds and weak bonds, Hybridization, Types of Hybridization.

Unit-IV: Thermodynamics

Introduction, First law of thermodynamics, Internal energy, Enthalpy, Application. Second law of thermodynamics, Entropy, Gibb's Free energy, Spontaneity of reaction, Third law of thermodynamics.

Unit – V: Basic principles of organic chemistry

Classification of organic compounds based on functional groups, IUPAC nomenclature of organic compounds, Isomerism. Tetravalency of carbon, Shapes of simple molecule.

SESSION	2018-19
CLASS	B.Sc. BIOCHEMISTRY (HONS.)
SEMESTER	II
PEPER	H-3
TITLE OF THE PAPER	Techniques & Instrumentation
Max.	70

Unit – I: Centrifugation:

Principle of Centrifugation, Types of centrifuges, Preparative and Analytical centrifugation, sedimentation coefficient, RCF, Factors affecting RCF, Ultracentrifugation, Applications in biology.

Unit – II: Chromatography

Principle and types of Chromatography, Introduction and applications, Paper chromatography, TLC, Column chromatography, GLC, HPLC, Affinity chromatography, Ion-exchange chromatography, Molecular sieving chromatography,

Unit – III: Electrophoresis

Introduction, Principle and Types of Electrophoresis and factors affecting the rate of electrophoresis, Free and Zonal electrophoresis, Paper electrophoresis, Gel electrophoresis, Immuno-electrophoresis, Iso-electric focusing.

Unit – IV: Spectroscopy

Principle of Spectroscopy, Beer-Lambert's Law, Light absorption and transmission, UV-Visible and Infrared Spectroscopy, Concept of NMR, Mass spectroscopy, X-ray diffraction, Bragg's law, Atomic absorption principle and application.

Unit – V: Radioactivity

Production of Isotopes, Synthesis of labeled compounds, measurement of radioactivity, Methods based upon Gas ionization, Ionization chamber, Proportional counters, Geiger Muller counter, Methods based upon excitation - Liquid Scintillation Counting.

Microscopy: Principle of microscopy, types, compound light phase, contrast florescence microscope, electron microscope and application.

SESSION	2018-19
CLASS	B.Sc. BIOCHEMISTRY (HONS.)
SEMESTER	II
PEPER	H-4
TITLE OF THE PAPER	Chemistry - II
Max.	70

Unit –I: Chemical Kinetics

Rate expression, Order of a reaction, Units of rates and specific rate constants, Order of reaction and effect of concentration, fast reaction, photochemical reaction mechanism, Graphical representation of reaction.

Unit – II

s–block elements: comparative study of ns1 and ns2 blocks, diagonal relationship, salient features of hydrides, salvation and complex formation tendencies.

p-block elements: comparative study of group 13-17 elements, compounds. Basic properties of halogens and inert gas.

d-block elements: transition series and physical properties (stability, oxidation states, magnetic and catalytic).

Unit – III

Electronic effects: Inductive Effect, Mesomeric Effect, resonance effect, Electrometric Effect and Hyper conjugation. Nucleophiles and Electrophiles.

Reaction Intermediates: Carbonium ions, Carbanions, Free radicals and Carbenes Homolytic and heterolytic cleavage.

Unit – IV

Reaction Mechanism: Alcohols (Acylation, dehydration, dehydrogenation, oxidation). Phenols (Acylation, electrophilic aromatic displacement reaction).

Aldehydes and Ketones: Oxidation, Reduction, Aldol condensation, Canizaro reaction).

Carboxylic acid: Reaction for Amine and Aldehyde formation.

Unit – V

Identification of organic compounds by various methods: Extraction by solvents, Purification of organic compound by crystallization and its types, Sublimation, Distillation and its types, Kjeldahl's method.

SESSION	2019-20
CLASS	B.Sc. BIOCHEMISTRY (HONS.)
SEMESTER	III
PEPER	H-5
TITLE OF THE PAPER	Physiology
Max.	70

Unit – I: Blood

Composition and functions of Blood, Types of blood cells and their formation, Plasma Proteins: Properties and functions, Coagulation of Blood, Hemoglobin, Transport of oxygen and carbon dioxide.

Unit – II: Digestive System

Physiology of Gastrointestinal Tract (GIT), Saliva, Mouth, Oesophagus, Stomach, Pancreas, Liver, Gall Bladder, Intestine, Digestion and absorption of food.

Unit – III: Excretory System

Physiology and Anatomy of Kidney, Structure of Nephron, Types of Nephron, Mechanism of formation of urine, Urea Cycle, Renal regulation of acids & bases, Counter-current theory.

Unit – IV: Nervous System

Structure, types and functions of Neurons, properties of Nerve fibers, Saltatory conduction, Na-K Pump, Synaptic transmission.

Structure, Types and Functions of Muscles, Structure of a Muscle fiber, Muscle Contraction Theories, Muscle Proteins, Role of Ca^{++} in Muscle contraction.

Unit – V: Hormones

Introduction, Mechanism of action of hormones, Pituitary hormones, Thyroid Hormones, Parathormone, Pancreatic Hormones, Adrenal Hormones, Gonadial Hormones.

SESSION	2019-20
CLASS	B.Sc. BIOCHEMISTRY (HONS.)
SEMESTER	III
PEPER	H-6
TITLE OF THE PAPER	Molecular Biology
Max.	70

Unit – I

Genetic code: Basic features, biological significance, various types of genes, Wobble hypothesis. Organization of DNA and RNA in prokaryotes - eukaryotes, Types of DNA & RNA.

Unit – II

Central Dogma, DNA replication in prokaryotes and eukaryotes, conservative, semi conservative and dispersive types, Enzymology of DNA replication. Errors & regulation DNA replication, DNA repair.

Unit – III

Transcription in Prokaryotes: Mechanism of Transcription (Initiation, Elongation, Termination), RNA polymerases, Promoters, Post transcriptional modification, Inhibitors of transcription.

Unit – IV

Translation: Mechanism of Translation (Initiation, Elongation & Termination), Ribosomes structure, A & P sites, Prokaryotic and Eukaryotic Ribosomes, Release Factors and Nonsense codons, Post translational modifications. Apoptosis.

Unit – V

Regulation of Gene Expression – Concept of Operon, Promoters, Operator, Repressers, Structural genes, Inducers, *lac* operon, *trp* operon, Attenuation, *ara* operon, Positive Regulation, Negative Regulation, Cascade regulation.

SESSION	2019-20
CLASS	B.Sc. BIOCHEMISTRY (HONS.)
SEMESTER	IV
PEPER	H-7
TITLE OF THE PAPER	Enzymes
Max.	70

Unit- I

General Properties of Enzymes, Structural properties of enzymes, Nomenclature and Classification of Enzymes, Protein nature of Enzymes, Non-protein enzymes, Metalloenzymes and Metal activated enzymes.

Unit – II

Models proposed for Enzymatic Reactions, Factors affecting the rate of enzyme catalyzed reaction. Mechanism of action of enzymes: Lock & Key Model, Induced Fit Model, Enzyme-substrate Model, enzyme activity measurement.

Unit – III

Acid-base catalysis of enzymes, Covalent catalysis, Metal ion catalysis, Serine Protease, Ribonuclease, Chymotrypsin, Lysozyme.

Unit – IV

Enzyme inhibition: Reversible-Irreversible inhibition, Feedback Inhibition, Concept of Coenzymes and Cofactors. Allosteric Inhibition.

Unit – V

Enzyme Biotechnology – Immobilization, Uses of enzymes in milk industry, food industry, leather industry, enzymes in cellulose & metal degradation, Designer enzymes, Biosensors, extraction and purification.

SESSION	2019-20
CLASS	B.Sc. BIOCHEMISTRY (HONS.)
SEMESTER	IV
PEPER	H-8
TITLE OF THE PAPER	Genetic Engineering
Max.	70

Unit – I

Pre-mendelian theories, Law of Dominance, Law of Segregation, Law of Independent Assortment, Codominance, Monohybrid Cross, Dihybrid Cross, Back Cross and Test Cross, Concept of Gene: Allele and multiple allele, Pseudo-alleles.

Unit – II

Linkage and Crossing over, Cytological basis of crossing over, molecular mechanism of crossing over, Two factor and Three factor crosses, Chromosomal Mapping, Recombination, Types and Mechanism of Recombination.

Unit – III

Mutation, Molecular basis of Mutation, Chromosomal Mutation, Types of Mutation, Transition, transversion, Frameshift mutation, Insertion, Deletion, Backward and forward, Spontaneous and Induced Mutation.

Unit – IV

PAGE, PCR, RFLP.

DNA finger printing and foot printing,

Blotting Techniques: Southern, Northern & Western Blotting.

Unit – V

Recombinant DNA technology, Restriction Endonuclease, Cloning and DNA Hybridization, Introduction to Cloning Vectors, hybridoma technique.

SESSION	2020-21
CLASS	B.Sc. BIOCHEMISTRY (HONS.)
SEMESTER	V
PEPER	H-9
TITLE OF THE PAPER	Clinical Biochemistry
Max.	70

Unit – I

Water and Electrolyte Balance and Imbalance, Dehydration, Water Intoxication, Acid-Base Balance and Imbalance, Regulation of acid-base by respiration, Regulation of acid-base by renal.

Unit – II

Functions of Liver, Liver Function Tests, Renal Function Tests: Glomerular Filtration Tests, Tests for Renal Blood Flow, Tests of Tubular functions, Gastric Function Tests, Thyroid Function Tests.

Unit – III

Clinical Significance of Enzyme Assay, Serum Enzymes in Heart Diseases, Serum Enzymes in Liver Diseases, Serum Enzymes in GI Tract Diseases, Serum Enzymes in Muscle Diseases, Serum Enzymes in bone Diseases.

Unit – IV

Blood Sugar, Hypoglycemia & Hyperglycemia, Measurement of Blood sugar, Maintenance of Normal Blood Glucose, Introduction to Diabetes Mellitus, Ketone Bodies, Fatty Liver & Obesity, Jaundice, falaria, stone diseases.

Unit – V

Biochemistry of Cancer cells, Carcinogenesis, Properties of cancer of cells, Biochemistry of Metastasis, Oncogenic Markers & Tumour Markers, Etiology of Cancer.

SESSION	2020-21
CLASS	B.Sc. BIOCHEMISTRY (HONS.)
SEMESTER	V
PEPER	H-10
TITLE OF THE PAPER	Metabolism
Max.	70

Unit – I

Biological Oxidation: Oxidation, Reduction, Enzymes involved in oxidation-reduction, Electron Transport Chain in detail. Basal Metabolic Rate & its affecting factors.

Unit – II

Digestion and absorption of carbohydrates, Concept of Carbohydrate Metabolism, Glycolysis – aerobic & anaerobic Glycolysis, TCA cycle, Glycogen Metabolism.

Unit - III

Digestion, absorption and mobilization of Lipids, Transport of Fatty Acids, Role of Hormones in Digestion and mobilization, Elementary idea of metabolism of Triglycerides, β -oxidation of Fatty acids, Cholesterol, Ketone Bodies.

Unit – IV

Digestion, absorption and mobilization of Proteins and Amino Acids, Oxidation, Reduction, Decarboxylation, deamination and transamination of amino acids, Concept of Glucogenic and Ketogenic amino acids, Nitrogen excretion and Urea cycle.

Unit – V

Haem Metabolism – Source of Bilirubin,. Transport of Bilirubin, Conjugation of Bilirubin, Secretion and excretion of Bilirubin. Detoxication.

SESSION	2020-21
CLASS	B.Sc. BIOCHEMISTRY (HONS.)
SEMESTER	V
PEPER	H-11
TITLE OF THE PAPER	Industrial Biochemistry
Max.	70

Unit – I: Fermentation technology

Industrial fermentation, Production of ethyl alcohol, Fermentative production of Organic acids - citric acid, lactic acid, acetic acid, Enzymes - amylase, proteases, streptokinase, Amino acids - glutamic acid, lysine and Vitamins. Industrial production of SCP, Biocontrol agents.

Unit – II: Sugar Industry

Introduction, Manufacture of cane sugar, Extraction and purification of juice, quality measurement, defection, sulphitation and carbonation, concentration or evaporation, crystallization, recovery of sugar from molasses, Manufacture of sucrose from beet root and testing of sugar.

Unit – III: Fats, Oils and Detergents

Natural fats, edible and industrial oils of vegetable origin, common fatty acids, glycerides, purification of oils and refineries, halogenations of unsaturated oils, saponification value, iodine value, acid value, soaps and synthetic detergents.

Unit – IV: Paper and pulp technology

Introduction, Types of pulping, manufacturing of pulp, sulphate or craft pulp, soda pulp, sulphite pulp, rag pulp, beating, refining, filling, sizing and colouring. Peroxide bleaching and its chemistry, resin synthesis, Importance of bleaching, Manufacture of paper, calendaring and uses, Paper industry in India.

Unit – V: Safety and Quality Control

Biological Standardization: Principles, Scope & limitations of Bioassays. US-FDA & ICH guideline for quality measurement, Good Clinical Practices, Regulatory aspects of bioavailability, Concept of industrial process and product validation, NABL and NABH accreditation.

SESSION	2020-21
CLASS	B.Sc. BIOCHEMISTRY (HONS.)
SEMESTER	VI
PEPER	H-12
TITLE OF THE PAPER	Pharmaceutical Chemistry
Max.	70

Unit – I: General Pharmacology

Nature and sources of drugs, Routes of drug administration and Dosage forms, Absorption and Bioavailability of drugs, Factors affecting drug absorption, Distribution of drugs, Fate of drugs. Pharmacokinetic models, Application of Pharmacokinetics in new drug development and designing, drug delivery systems

Unit – II

Dosage form consideration in preformulation, solid dosage form, solution formulations, emulsion, suspension, freeze dried products and its regulatory considerations, drug design phase, solubility analysis, dissolution and permeation, characterization scheme, stability tastings, order of reaction, antioxidants, chelating agents, impurity, GMP related to bulk drugs and APIs, Quality control of drug.

Unit – III

Mechanism of action of a drug, Drug Receptors, Dose response relationship, Adverse drug reactions (ADR), Manifestations of ADR, Factors affecting the drug effect.

Unit – IV

Drugs in GIT: Digestants, Antiflatulants, Appetite suppressants, Hypolipidaemic agents. Emetics, drug therapy of vomiting, Vertigo and Diarrhea, Pharmacotherapy of constipation. Sedatives, Hypnotics, Antipyretic and analgesic drugs, NSAIDS, Pharmacology of cough, Hypertension and Heart failure.

Unit – V: Chemotherapy

General principles of chemotherapy of infections, Chemotherapy of UTI, Chemotherapy of Malaria, Chemotherapy of Tuberculosis, Chemotherapy of viral infections, Antiseptics, disinfectants and insecticides.

SESSION	2020-21
CLASS	B.Sc. BIOCHEMISTRY (HONS.)
SEMESTER	VI
PEPER	H-13
TITLE OF THE PAPER	Food & Nutrition
Max.	70

Unit – I

Concept of food and Nutrition, Balanced Diet, Daily, Recommended Diet for adults, women and children, Nutritional aspects of carbohydrates, fats and proteins, Daily Requirement of Vitamins and Minerals.

Unit – II

Energy Measurement, Calorific Value of Food, Respiratory Quotient, SDA & BMR Factors affecting SDA. Preparation of diet chart, WHO diet recommendation

Unit – III

Diet in Pregnancy & Lactation, Diet in Diabetes Mellitus, Diet in Fevers and Infections, Diet in G.I. Disorders (Diarrhoea, constipation, peptic ulcer)

Unit- IV

Protein Energy Malnutrition, Causes of Malnutrition in India, Community nutrition, Malnutrition and infection, Obesity, Weaning foods, Importance of correct and timely weaning

Unit- V

Planning and preparation of diet in hypertension, in kidney failure, in various diseases. Preparation of low cost recipes, cost concept and cost control, Concept of food supplement, probiotics and organic food.

SESSION	2018-19
CLASS	B.Sc. BIOCHEMISTRY (Subs.)
SEMESTER	I
PEPER	S-I
TITLE OF THE PAPER	Botany
Max.	70

Unit – I: Plant Classification & Taxonomy

(A). Concept of Gymnosperm and Angiosperm, Methods of Plant Breeding- Introduction, Selection and Hybridization (pedigree, backcross, mass selection, bulk method).

(B). **Bryophytes and Pteridophytes** Occurrence, morphology, classification, anatomy and reproduction.

Unit – II

Algae: Occurrence, Structure, Classification and Reproduction.

Cyanobacteria: Occurrence, Structure, Classification and Reproduction.

Fungi: Classification, Occurrence, Structure and Reproduction.

UNIT – III

(A). Morphology, Anatomy and different function of Flowering plants, Root, Stem, Leaves, Flower, Fruit and seeds.

(B). Movement of water, food, Nutrients and exchange of gases, Plant and water, mineral nutrition.

Unit – IV: Photosynthesis

Photochemical reaction, Photophosphorylation, Carbon fixation Pathway; C₃, C₄ pathway, Respiration (aerobic, anaerobic), Photorespiration, Nitrogen cycle and Fixation.

Unit – V

Importance of secondary metabolites, Pigments as photoreceptors, Plant movements; photoperiodism and flowering, Vernalisation, senescence, Growth substances (Plant Hormones), their chemical nature and role, Fruit Ripening, Dormancy, Storage and Germination of seeds.

SESSION	2018-19
CLASS	B.Sc. BIOCHEMISTRY (Subs.)
SEMESTER	II
PEPER	S-2
TITLE OF THE PAPER	Zoology
Max.	70

Unit – I: Invertebrates

General characteristics and outline classification of non-chordates according to Parker and Haswell (revised by Marshall and Williams). Type Studies: Protozoa (Paramecium), Porifera (Sycon), Coelentrata (Obelia), Helminthes (Liver Fluke), Annelida (Earthworm), Arthropoda (Prawn), Mollusca (Pila) and Echinodermata (Star Fish).

Unit – II: Chordata

General characteristics and outline classification of Chordates according to Parker and Haswell (revised by Marshall and Williams). Type Studies: Hemichordata (Balangosus), Urochordata (Herdmania), Cephalochordata (Amphioxus), Pisces (Scoliodon), Amphibia (Frog), Reptilia (Uromastix), Aves (Pigeon) and Mammalia (Rabbit).

Unit – III: Developmental biology & Evolution

Gametogenesis: Spermatogenesis and oogenesis, Placentation in mammals, Fertilization, Types of eggs, Patterns of Cleavage, Blastulation and gastrulation in Frog and Chick up to formation of germinal layers., Fate Maps, Organizer concept.

Unit – IV: Origin of life

Theories of Evolution (Lamarckism, Darwin and Neo Darwin). Population concept: Characteristics of population, Population growth and factors affecting population, population control.

Unit – V: Animal behaviour & Applied zoology

General introduction to Ethology, Innate and Learned behavior (Instinct, Imprinting and motivation), Social Behaviour (Insect and Primates), Neural and Hormonal control of behaviour. Biological Clocks (Circadian and Circannual Rhythm), Communication, Perception of environment (Audio and Visual). Aquaculture (Prawn & Fish), Lac culture, Sericulture, Apiculture.

SESSION	2019-20
CLASS	B.Sc. BIOCHEMISTRY (Subs.)
SEMESTER	III
PEPER	S-3
TITLE OF THE PAPER	Cell Biology
Max.	70

Unit – I

Morphology of Cell, Prokaryotic and Eukaryotic Cell, Plant Cell Vs Animal Cell, Structure and Composition of Plant cell wall, Bacterial Cell wall and Plasma Membrane, Transport across the Plasma membrane.

Unit - II

Origin, Structure, Cellular organization and functions of mitochondria, golgi apparatus, Chloroplast, endoplasmic reticulum, lysosomes, nucleus, ribosomes.

Unit - III

Cell Cycle, Cell division: Interphase, Mitosis, Meosis and its regulation, Ageing of cell, Cell death, Cytoskeleton, Cell adhesion, Cell junctions.

Unit – IV

Structural organization and chemical composition of chromosomes - nucleosomes organization, special chromosomes, Chromosome staining, Banding pattern in human chromosomes.

Unit – V

Endocytosis, Exocytosis, Receptors basics of signal transduction, Protein trafficking, Protein sorting, Stem cell biology, Cancer cell biology.

SESSION	2019-20
CLASS	B.Sc. BIOCHEMISTRY (Subs.)
SEMESTER	IV
PEPER	S-4
TITLE OF THE PAPER	Microbiology
Max.	70

Unit – I

Introduction to Microorganisms, Classification of Bacteria, Occurrence, Morphology, Locomotion and Structural organization, Gram +ve and –ve bacteria, Reproduction in bacteria.

Unit – II

Introduction to Viruses, Classification, Occurrence, Morphology, Structural organization, Reproduction in virus, Reverse Transcription, Transformation, Transduction, life cycle of virus.

Unit – III: Culture Media

Introduction, types of culture media, Nutritive Media, Growth of Bacteria, minimal media, pure culture, methods of isolation, maintenance and preservation of Pure culture, factor affecting growth, growth cycle .

Unit – IV: Microorganisms and Industry

Industrial uses of Bacteria and Yeasts, Bioengineering, and Bioprocessing: Food spoilage and preservation, Food born infection and diseases, Disposal of domestic and industrial wastes, Biochemistry of active compounds of microorganism.

Unit – V

Immobilization of microbes, Types of immobilization, Applications in Microbiology and Biochemistry, Fermentation Technology.

Microbial Pathology: mechanism of microbial pathogenesis, pathology of common microbial disease and currently therapy, Common microbial infection and treatment.

SESSION	2020-21
CLASS	B.Sc. BIOCHEMISTRY (Subs.)
SEMESTER	V
PEPER	S-5
TITLE OF THE PAPER	Immunology
Max.	70

Unit – I

Types of Immunity, Innate, Acquired Immunity, Passive and active Immunity, Cellular and Humoral Immunity. Cells and organs involved in Immune response.

Unit – II: Specificity & activation of immune system

T and B lymphocyte classes. Major histocompatibility complex I and II. Humoral immune response and its regulation. Cell mediated immunity-cytolytic and natural killer T lymphocytes. Activation of B lymphocytes.

Unit – III: Immunoglobulins

Properties, Structure, types and function of immunoglobulins, B-cell Receptors, Epitopes, Antigenic determinants on immunoglobulins.

Unit - IV

Allergy and allergens, autoimmune disorders, Immunodeficiency diseases, Vaccines, types of vaccines, Immune response in various infectious diseases, Immunity in AIDS and Cancer.

Unit - V

Antigen-antibody interactions, Precipitation, Agglutination, Cross reactivity, Concept of Radioimmunoassay, Enzyme-linked immunosorbent assay, Western Blotting, Immunofluorescence.

Paper FC- 1

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Unit-I

- 1- Lora=rkiqdkjrh $\frac{1}{4}$ dfork $\frac{1}{2}$ & t;'kadjizlkn
- 2- iq"i dh vfHkyk"kk $\frac{1}{4}$ dfork $\frac{1}{2}$ &ek[kuykyprqosZnh
- 3- okD; lajpukvkSj v'kqf);kj $\frac{1}{4}$ ladfyr $\frac{1}{2}$
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Unit-II

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- 2- ,d FksjtkHkkst $\frac{1}{4}$ fuca/k $\frac{1}{2}$ &MkW- f=HkqouukFk 'kqDy
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- 4- fojkefpUg& $\frac{1}{4}$ ladfyr $\frac{1}{2}$] laf/k $\frac{1}{4}$ ladfyr $\frac{1}{2}$

Unit-III

- 1- Hkxokucq) $\frac{1}{4}$ fuca/k $\frac{1}{2}$ &LokehfoosdkuUn
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- 3- ugha :dh gS unh &ghjkykyckNksfr;k
- 4- iYYkou

Unit-IV

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- 4- lekl $\frac{1}{4}$ ladfyr $\frac{1}{2}$

Unit-V

- 1- uSfrdewY; ifjp; ,oaoxhZdj.k $\frac{1}{4}$ vkys[k $\frac{1}{2}$ &MkW- 'kf'kjk;
- 2- vkpj.k dh IH;rk $\frac{1}{4}$ fuca/k $\frac{1}{2}$ &ljkjiw.kZ flag
- 3- varKkZuvkSjuSfrd thou $\frac{1}{4}$ ys[k $\frac{1}{2}$ &MkW- loZiYYkhjk/kkd`".ku
- 4- vllknhiksHko $\frac{1}{4}$ ys[k $\frac{1}{2}$ &Lokeh J)kuan

F C - 2

English Language

Unit – I

1. Where the mind is without fear : Rabindranath Tagore
2. The Hero: R.K.Narayan
3. Trust with destiny: Jawaharlal Nehru
4. Indian Weavers:Sarojini Naidu
5. The Portrait of a lady:Khushwant Singh
6. The Solitary Reaper: William Wordsworth

Unit – II

Basic Language Skills: Vocabulary, Synonyms, Antonyms, Word Formation, Prefixes, Suffixes.

Unit – III

Basic Language Skills: Uncountable Nouns, Verbs, Tenses, Adverbs.

Unit – IV

Comprehension/Unseen Passage, Translation of sentences (English to Hindi & Hindi to English).

Unit – V

Composition and Paragraph Writing

F C-3

Entrepreneurship Development

Unit – I

Entrepreneurship Development - Concept and importance, function of enterpriser, Goal determination – problems, challenges and solutions.

Unit – II

Project Proposal -Need and objects, Nature of organization, Production Management, Financial Management, Marketing Management, Consumer Management.

Unit –III

Role of regulatory institutions, Role of development organizations, Self employment oriented schemes, Various growth schemes.

Unit – IV

Financial management of project - Financial institution and their role, Capital estimation and arrangement, Cost and price determination, Accounting management.

Unit – V

Problem of entrepreneurs - Problem relating capital, Problem relating registration, Administration problem and how to overcome from above problems.

F C -04

Environmental Studies

Unit – I Study of Environment & Ecology

- (a) Definition and Importance.
- (b) Public participation and Public awareness.
- (c) Ecology – Introduction.
- (d) Ecosystem – Concepts, components, structure & functions, Energy flow, Food chain, Food web, Ecological Pyramids & types.

Unit – II Environmental Pollution and Population

- (a) Air, Water, Noise, Heat and Nuclear Pollution, Definition, causes, effects and prevention of pollution.
- (b) Population Growth, Disparities between countries.
- (c) Population Explosion, Family Welfare Programme.
- (d) Environment and human health.
- (e) Cleanliness and disposal of domestic waste.

Unit – III Natural Resources, Problems and Conservation

- (a) Water Resources
- (b) Forest Resources
- (c) Land Resources
- (d) Food Resources
- (e) Energy Resources

Unit – IV Bio-diversity and its protection

- (a) Introduction – Genetic species and ecosystem diversity.
- (b) Value of Bio-diversity – Consumable use, Productive use, Social, Moral and Aesthetic Values.
- (c) India as a nation of mega bio-diversity centre, Bio-diversity at national and local levels.
- (d) Threats to Bio-diversity – Loss of Habitat, Poaching of wild life, Man and wild life conflicts.

Unit – V Disaster Management and Environmental Laws

- (a) Disaster Management – Flood, Earthquake, Cyclones and Landslides.

- (b) Conservation of laws for air and water pollution.
- (c) Wildlife Conservation Laws.
- (d) Role of information technology in protecting environment and health.

Department of Chemistry

A.P.S. University Rewa (M.P.)

(Academic Session 2018-19)

Class	–	B.Sc.(Honors) Biochemistry I & II SEM.
Subject	–	Chemistry
Paper	–	Practical
Max. Marks: 200 (100 + 100)	–	Time: 6 Hours

Physical Chemistry

- | | |
|--|-----------------|
| (A) Any one Experiment | 24 Marks |
| (i) Determination of melting point | |
| (ii) Determination of boiling point | |
| (iii) Weighing and preparation of solution | |
| (B) Any one Experiment | 24 Marks |
| (i) Determination of surface tension /percentage composition of given liquid mixture using surface tension method. | |
| (ii) Determination of viscosity/percentage composition of given liquid mixture using viscosity method. | |

Inorganic Chemistry

32 + 16 Marks

- (i) Inorganic mixture analysis
(Mixture analysis for two cations and two anions)
- (ii) Separation of cations by paper chromatography

Organic Chemistry (Any two)

48 Marks

- (i) Crystallization
- (ii) Sublimation
- (iii) Detection of elements
- (iv) Identification of functional group

Viva-voce

26 Marks

Record

30 Marks

*Practical examination will be held at the end of II SEM.

Department of Chemistry
A.P.S. University Rewa (M.P.)

(Academic Session 2018-19)

Class	–	B.Sc.(Honors) Biochemistry I & II SEM.
Subject	–	Botany /Zoology (Subsidiary)
Paper	–	Practical
Max. Marks: 200 (100 + 100)	–	Time: 6 Hours

(A) **Botany:** Any two Experiments

(18 + 17) Marks

- (i) To study the tissue organization in root and shoot apices using permanent slides.
- (ii) Morphology and anatomy of the following Hibiscus, Pinus.
- (iii) Section cutting of Bryophytes and Pteridophytes.
- (iv) Comparative study of mitosis and meiosis cell division in plant cell by using permanent slides.
- (v) Systematic study of locally available plants belonging to families prescribed theory practical.
- (vi) Demonstration of herbarium techniques.

(B) **Zoology:** Any two Experiments

(18 + 17) Marks

- (i) Identify and comment upon spots.
- (ii) Preparation of blood film (Leishmen's stain) prepared slides showing the parasites.
- (iii) Study of T.S. and L.S. of different human organs (Prepared slides).
- (iv) Comparative examination of mitosis and meiosis in an animal cell by using prepared slides.
- (v) Study of living animals – Amoeba, Paramecium, Euglena, Hydra, Starfish, Octopus.
- (vi) Demonstration of different developmental stages of embryo of frog by prepared slides.

Viva-voce

14 Marks

Record

16 Marks

*Practical examination will be held at the end of II SEM.

