

BOARD OF INTERMEDIATE EDUCATION, A.P., HYDERABAD

REVISION OF SYLLABUS

Subject – BOTANY-II (w.e.f 2013-14)

UNIT-I Plant Physiology	PERIODS
<p>Chapter 1: Transport in Plants Means of Transport- Diffusion, Facilitated Diffusion, Passive symports and antiports, Active Transport, Comparison of Different Transport Processes, Plant-Water Relations- Water Potential, Osmosis, Plasmolysis, Imbibition, Long Distance Transport of Water- Water Movement up a Plant, Root Pressure, Transpiration pull, Transpiration- Opening and Closing of Stomata, Transpiration and Photosynthesis, Uptake and Transport of Mineral Nutrients- Uptake of Mineral Ions, Translocation of Mineral Ions, Phloem Transport: Flow from Source to Sink-The Pressure Flow or Mass Flow Hypothesis</p> <p>Chapter 2: Mineral Nutrition Methods to Study the Mineral Requirements of Plants, Essential Mineral Elements-Criteria for Essentiality, Macronutrients, Micronutrients, Role of Macro- and Micro-nutrients, Deficiency Symptoms of Essential Elements, Toxicity of Micronutrients, Mechanism of Absorption of Elements, Translocation of Solutes, Soil as Reservoir of Essential Elements, Metabolism of Nitrogen-Nitrogen Cycle, Biological Nitrogen Fixation, Symbiotic nitrogen fixation, Nodule Formation</p> <p>Chapter 3: Enzymes Chemical Reactions, Enzymatic Conversions, Nature of Enzyme Action, Factors Affecting Enzyme Activity, Temperature and pH, Concentration of Substrate, Classification and Nomenclature of Enzymes, Co-factors</p> <p>Chapter 4: Photosynthesis in Higher Plants Early Experiments, Site of Photosynthesis, Pigments Involved in Photosynthesis, Light Reaction, The Electron Transport-Splitting of Water, Cyclic and Non-cyclic Photo-phosphorylation, Chemiosmotic Hypothesis, Biosynthetic phase- The Primary Acceptor of CO₂, The Calvin Cycle, The C₄ Pathway, Photorespiration, Factors affecting Photosynthesis</p>	<p>60</p>

<p>Chapter 5: Respiration of Plants Cellular respiration, Glycolysis, Fermentation, Aerobic Respiration- Tricarboxylic Acid Cycle, Electron Transport System (ETS) and Oxidative Phosphorylation, The Respiratory Balance Sheet, Amphibolic Pathway, Respiratory Quotient</p> <p>Chapter 6: Plant Growth and Development Growth- Plant Growth, Phases of Growth, Growth Rates, Conditions for Growth, Differentiation, Dedifferentiation and Redifferentiation, Development, Plant Growth Regulators- Physiological Effects of Plant Growth Regulators, <i>Auxins, Gibberellins, Cytokinins, Ethylene, Abscisic acid</i>, Seed Dormancy, Photoperiodism, Vernalisation</p>	
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UNIT II : Microbiology	PERIODS
<p>Chapter 7: Bacteria Morphology of Bacteria, Bacterial cell structure- Nutrition, Reproduction- Sexual Reproduction, Conjugation, Transformation, Transduction, The importance of Bacteria to Humans</p> <p>Chapter 8: Viruses Discovery, Classification of Viruses, structure of Viruses, Multiplication of Bacteriophages- The Lysogenic Cycle, Viral diseases in Plants, Viral diseases in Humans</p>	10

UNIT III: Genetics	PERIODS
<p>Chapter 9: Principles of Inheritance and Variation Mendel's Experiments, Inheritance of one gene (Monohybrid Cross)- Back cross and Test cross, Law of Dominance, Law of Segregation or Law of purity of gametes, Deviations from Mendelian concept of dominance- Incomplete Dominance, Co-dominance, Explanation of the concept of dominance, Inheritance of two genes- Law of Independent Assortment, Chromosomal Theory of Inheritance, Linkage and Recombination, Mutations- Significance of mutations.</p>	10

UNIT IV: Molecular Biology	PERIODS
<p>Chapter 10: Molecular Basis of inheritance</p> <p>The DNA- Structure of Polynucleotide Chain, Packaging of DNA Helix, The Search for Genetic Material, Transforming Principle, Biochemical Characterisation of Transforming Principle, The Genetic Material is DNA, Properties of Genetic Material (DNA versus RNA), RNA World, Replication-The Experimental Proof, The Machinery and the Enzymes, Transcription-Transcription Unit, Transcription Unit and the Gene, Types of RNA and the process of Transcription, Genetic Code-Mutations and Genetic Code, tRNA– the Adapter Molecule, Translation, Regulation of Gene Expression-The <i>Lac</i> operon.</p>	15

UNIT V: Biotechnology	PERIODS
<p>Chapter 11: Principles and processes of Biotechnology</p> <p>Principles of Biotechnology-Construction of the first artificial recombinant DNA molecule, Tools of Recombinant DNA Technology-Restriction Enzymes, Cloning Vectors, Competent Host (For Transformation with Recombinant DNA), Processes of Recombinant DNA Technology- Isolation of the Genetic Material (DNA), Cutting of DNA at Specific Locations, Separation and isolation of DNA fragments, Insertion of isolated gene into a suitable vector, Amplification of Gene of Interest using PCR, Insertion of Recombinant DNA into the Host, Cell/Organism, Selection of Transformed host cells, Obtaining the Foreign Gene Product, Downstream Processing</p> <p>Chapter 12: Biotechnology and its applications</p> <p>Biotechnological Applications In Agriculture-Bt Cotton, Pest Resistant Plants, Other applications of Biotechnology Insulin, Gene therapy, Molecular Diagnosis, ELISA, DNA fingerprinting, Transgenic plants, Bio-safety and Ethical issues- Biopiracy</p>	22

UNIT VI: Plants, Microbes and Human welfare	PERIODS
<p>Chapter 13: Strategies for enhancement in food production</p> <p>Plant Breeding- What is Plant Breeding?, Wheat and Rice, Sugarcane, Millets, Plant Breeding for Disease Resistance, Methods of breeding for disease resistance, Mutation, Plant Breeding for Developing Resistance to Insect Pests, Plant Breeding for Improved Food Quality, Single Cell Protein (SCP), Tissue Culture</p> <p>Chapter 14: Microbes in Human Welfare</p> <p>Microbes in Household Products, Microbes in Industrial Products-Fermented Beverages, Antibiotics, Chemicals, Enzymes and other Bioactive Molecules, Microbes in Sewage Treatment, Primary treatment, Secondary treatment or Biological treatment, Microbes in Production of Biogas, Microbes as Biocontrol Agents, Biological control of pests and diseases, Microbes as Biofertilisers, Challenges posed by Microbes</p>	<p>18</p>

BOARD OF INTERMEDIATE EDUCATION, AP, HYDERABAD
Intermediate I Year Syllabus
Subject – BOTANY-I w.e.f. 2012-13

UNIT-I: DIVERSITY IN THE LIVING WORLD	PERIODS
<p>Chapter 1 : The living world What is living? Diversity in the living world; Taxonomic categories and taxonomical aids.</p> <p>Chapter 2 : Biological Classification Five kingdom classification - Monera, Protista, Fungi, Plantae and Animalia, Three domains of life (six kingdom classification), Viruses, Viroids, Prions & Lichens.</p> <p>Chapter 3 : Science of plants - Botany Origin, Development, Scope of Botany and Branches of Botany.</p> <p>Chapter 4 : Plant Kingdom Salient features, classification and alternation of generations of the plants of the following groups – Algae, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms.</p>	30
<p>UNIT - II : STRUCTURAL ORGANISATION IN PLANTS- MORPHOLOGY</p> <p>Chapter 5 : Morphology of flowering Plants</p> <p><i>Vegetative :</i> Parts of a typical Angiospermic plant; Vegetative morphology and modifications- Root, Stem and Leaf- types; Venation, Phyllotaxy.</p> <p><i>Reproductive:</i> Inflorescence – Racemose, Cymose and special types (in brief). Flower : Parts of a flower and their detailed description; Aestivation, Placentation.</p> <p>Fruits : Types- True, False and parthenocarpic fruits.</p>	20

UNIT-III: REPRODUCTION IN PLANTS	25
<p>Chapter 6 : Modes of Reproduction Asexual reproduction, binary fission, Sporulation, budding, fragmentation, vegetative propagation in plants, Sexual reproduction in brief, Overview of angiosperm life cycle.</p> <p>Chapter 7 : Sexual Reproduction in Flowering Plants Stamen, microsporangium, pollen grain. Pistil, megasporangium (ovule) and embryo sac; Development of male and female gametophytes.</p> <p>Pollination – Types, agents , Out breeding devices and Pollen – Pistil interaction.</p> <p>Double Fertilization; Post fertilisation events: Development of endosperm and embryo; development of seed, Structure of Dicotyledonous and Monocotyledonous seeds, Significance of fruit and seed.</p> <p>Special modes – Apomixis, parthenocarpy, polyembryony.</p>	
UNIT-IV: PLANT SYSTEMATICS	10
<p>Chapter 8 : Taxonomy of angiosperms Introduction.</p> <p>Types of Systems of classification (In brief).</p> <p>Semi- Technical description of a typical flowering plant</p> <p>Description of Families: Fabaceae, Solanaceae and Liliaceae.</p>	
UNIT-V: CELL STRUCTURE AND FUNCTION	35
<p>Chapter 9 : Cell – The Unit of Life Cell- Cell theory and cell as the basic unit of life- overview of the cell.</p> <p>Prokaryotic cells, Ultra Structure of Plant cell (structure in detail and functions in brief), Cell membrane, Cell wall, Cell organelles:</p>	

<p>Endoplasmic reticulum, Mitochondria, Plastids, Ribosomes, Golgi bodies, Vacuoles, Lysosomes, Microbodies, Centrosome and Centriole, Cilia, Flagella, Cytoskeleton and Nucleus.</p> <p>Chromosomes: Number, structural organization; Nucleosome.</p> <p>Chapter 10 : Biomolecules</p> <p>Structure and function of Proteins, Carbohydrates, Lipids and Nucleic acids.</p> <p>Chapter 11 : Cell cycle and Cell Division</p> <p>Cell cycle, Mitosis, Meiosis - significance.</p>	
UNIT-VI: INTERNAL ORGANISATION OF PLANTS	25
<p>Chapter 12 : Histology and Anatomy of Flowering Plants</p> <p>Tissues - Types, structure and functions: Meristematic; Permanent tissues - Simple and Complex tissues.</p> <p>Tissue systems - Types, structure and function: Epidermal, Ground and Vascular tissue systems.</p> <p>Anatomy of Dicotyledonous and Monocotyledonous plants - Root, Stem and Leaf.</p> <p>Secondary growth in Dicot stem and Dicot root.</p>	
UNIT-VII: PLANT ECOLOGY	12
<p>Chapter 13 : Ecological Adaptations, Succession and Ecological Services</p> <p>Introduction.</p> <p>Plant communities and Ecological adaptations: Hydrophytes, Mesophytes and Xerophytes.</p> <p>Plant succession.</p> <p>Ecological services – Carbon fixation, Oxygen release and pollination (in brief).</p>	
Total	157

BOARD OF INTERMEDIATE EDUCATION, A.P., HYDERABAD

REVISION OF SYLLABUS

Subject – CHEMISTRY-II (w.e.f 2013-14)

CHAPTER - 1	PERIODS
Chapter 1: SOLID STATE 1.1 General characteristics of solid state 1.2 Amorphous and crystalline solids 1.3 Classification of crystalline solids based on different binding forces (molecular, ionic, metallic and covalent solids) 1.4 Probing the structure of solids: X-ray crystallography 1.5 Crystal lattices and unit cells .Bravais lattices primitive and centred unit cells 1.6 Number of atoms in a unit cell (primitive, body centred and face centred cubic unit cell) 1.7 Close packed structures: Close packing in one dimension, in two dimensions and in three dimensions- tetrahedral and octahedral voids- formula of a compound and number of voids filled- locating tetrahedral and octahedral voids 1.8 Packing efficiency in simple cubic, bcc and in hcp, ccp lattice. 1.9 Calculations involving unit cell dimensions-density of the unit cell. 1.10 Imperfections in solids-types of point defects-stoichiometric and non-stoichiometric defects 1.11 Electrical properties-conduction of electricity in metals, semiconductors and insulators- band theory of metals 1.12 Magnetic properties	10

CHAPTER - 2	PERIODS
Chapter 2: SOLUTIONS 2.1 Types of solutions 2.2 Expressing concentration of solutions-mass percentag, volume percentage, mass by volume percentage, parts per million, mole fraction, molarity and molality 2.3 Solubility: Solubility of a solid in a liquid, solubility of a gas in a liquid, Henry's law 2.4 Vapour pressure of liquid solutions: vapour pressure of liquid- liquid solutions. Raoult's law as a special case of Henry's law -vapour pressure of solutions of solids in liquids 2.5 Ideal and non-ideal solutions 2.6 Colligative properties and determination of molar mass-relative lowering of vapour pressure-elevation of boiling point-depression of freezing point-osmosis and osmotic pressure-reverse osmosis and water purification. 2.7 Abnormal molar masses-van't Hoff factor	16

CHAPTER - 3	PERIODS
<p>Chapter 3: ELECTROCHEMISTRY AND CHEMICAL KINETICS</p> <p>ELECTROCHEMISTRY</p> <p>3.1 Electrochemical cells 3.2 Galvanic cells :measurement of electrode potentials 3.3 Nernst equation-equilibrium constant from Nernst equation- electrochemical cell and Gibbs energy of the cell reaction 3.4 Conductance of electrolytic solutions- measurement of the conductivity of ionic solutions-variation of conductivity and molar conductivity with concentration-strong electrolytes and weak electrolytes-applications of Kohlrausch's law 3.5 Electrolytic cells and electrolysis: Faraday's laws of electrolysis-products of electrolysis 3.6 Batteries: primary batteries and secondary batteries 3.7 Fuel cells 3.8 Corrosion of metals-Hydrogen economy</p> <p>CHEMICAL KINETICS</p> <p>3.9 Rate of a chemical reaction 3.10 Factors influencing rate of a reaction: dependance of rate on concentration- rate expression and rate constant- order of a reaction, molecularity of a reaction 3.11 Integrated rate equations-zero order reactions-first order reactions- half life of a reaction 3.12 Pseudo first order reaction 3.13 Temperature dependence of the rate of a reaction -effect of catalyst 3.14 Collision theory of chemical reaction rates</p>	<p style="text-align: center;">22</p>

CHAPTER - 4	PERIODS
<p>Chapter 4: SURFACE CHEMISTRY</p> <p>4.1 Adsorption and absorption: Distinction between adsorption and absorption- mechanism of adsorption-types of adsorption-characteristics of physisorption-characteristics of chemisorptions-adsorption isotherms- adsorption from solution phase-applications of adsorption 4.2 Catalysis:Catalysts,promoters and poisons-auto catalysis- homogeneous and heterogeneous catalysis- adsorption theory of heterogeneous catalysis-important features of solid catalysts: (a)activity (b)selectivity-shape-selective catalysis by zeolites- enzyme catalysis-characteristics and mechanism- catalysts in industry 4.3 Colloids 4.4 Classification of colloids:Classification based on physical state of dispersed phase and dispersion medium- classification based on nature of interaction between dispersed phase and dispersion medium- classification based on type of particles of the dispersed phase- multi molecular, macromolecular and associated colloids-</p>	<p style="text-align: center;">10</p>

cleansing action of soaps-preparation of colloids-purification of colloidal solutions- properties of colloidal solutions: Tyndal effect, colour,Brownian movement-charge on colloidal particles, electrophoresis 4.5 Emulsions 4.6 Colloids Around us- application of colloids	
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CHAPTER - 5	PERIODS
<p>Chapter 5: GENERAL PRINCIPLES OF METALLURGY</p> <p>5.1 Occurance of metals 5.2 Concentration of ores-levigation,magnetic separation,froth floatation,leaching 5.3 Extraction of crude metal from concentrated ore-conversion to oxide,reduction of oxide to the metal 5.4 Thermodynamic principles of metallurgy-Ellingham diagram-limitations-applications-extraction of iron, copper and zinc from their oxides 5.5 Electrochemical principles of metallurgy 5.6 Oxidation and reduction 5.7 Refining of crude metal-distillation,liquation poling,electrolysis,zone refining and vapour phase refining 5.8 Uses of aluminium, copper, zinc and iron</p>	12

CHAPTER - 6	PERIODS
<p>Chapter 6: p-BLOCK ELEMENTS</p> <p>GROUP-15 ELEMENTS</p> <p>6.1 Occurance- electronic configuration, atomic and ionic radii, ionisation energy,electronegativity, physical and chemical properties 6.2 Dinitrogen-preparation, properties and uses 6.3 Compounds of nitrogen-preparation and properties of ammonia 6.4 Oxides of nitrogen 6.5 Preparation and properties of nitric acid 6.6 Phosphorous-allotropic forms 6.7 Phosphine-preparation and properties 6.8 Phosphorous halides 6.9 Oxoacids of phosphorous</p> <p>GROUP-16 ELEMENTS</p> <p>6.10 Occurance- electronic configuration, atomic and ionic radii, ionisation enthalpy,electron gain enthalpy, electronegativity,physical and chemical properties 6.11 Dioxygen-preparation, properties and uses 6.12 Simple oxides 6.13 Ozone-preparation,properties, structure and uses 6.14 Sulphur-allotropic forms 6.15 Sulphur dioxide-preparation, properties and uses 6.16 Oxoacids of sulphur 6.17 Sulphuric acid-industrial process of manufacture, properties and uses</p>	24

<p>GROUP-17 ELEMENTS</p> <p>6.18 Occurance, electronic configuration, atomic and ionic radii, ionisation enthalpy, electron gain enthalpy, electronegativity, physical and chemical properties 6.19 Chlorine-preparation, properties and uses 6.20 Hydrogen chloride- preparation, properties and uses 6.21 Oxoacids of halogens 6.22 Interhalogen compounds</p> <p>GROUP-18 ELEMENTS</p> <p>6.23 Occurance, electronic configuration, ionisation enthalpy, atomic radii electron gain enthalpy, physical and chemical properties (a) Xenon-fluorine compounds-XeF_2, XeF_4 and XeF_6 -preparation, hydrolysis and formation of fluoro anions-structures of XeF_2, XeF_4 and XeF_6 (b) Xenon-oxygen compounds XeO_3 and XeOF_4 - their formation and structures</p>	
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CHAPTER – 7	PERIODS
<p>Chapter 7: d AND f BLOCK ELEMENTS & COORDINATION COMPOUNDS</p> <p>d AND f BLOCK ELEMENTS</p> <p>7.1 Position in the periodic table 7.2 Electronic configuration of the d-block elements 7.3 General properties of the transition elements (d-block) -physical properties, variation in atomic and ionic sizes of transition series, ionisation enthalpies, oxidation states, trends in the M^{2+}/M and $\text{M}^{3+}/\text{M}^{2+}$ standard electrode potentials, trends in stability of higher oxidation states, chemical reactivity and E^\ominus values, magnetic properties, formation of coloured ions, formation of complex compounds, catalytic properties, formation of interstitial compounds, alloy formation 7.4 Some important compounds of transition elements-oxides and oxoanions of metals-preparation and properties of potassium dichromate and potassium permanganate-structures of chromate, dichromate, manganate and permanganate ions 7.5 Inner transition elements(f-block)-lanthanoids- electronic configuration-atomic and ionic sizes-oxidation states- general characteristics 7.6 Actinoids-electronic configuration atomic and ionic sizes, oxidation states, general characteristics and comparison with lanthanoids 7.7 Some applications of d and f block elements</p> <p>COORDINATION COMPOUNDS</p> <p>7.8 Werner's theory of coordination compounds 7.9 Definitions of some terms used in coordination compounds 7.10</p>	<p>16</p>

<p>Nomenclature of coordination compounds-IUPAC nomenclature 7.11 Isomerism in coordination compounds-(a)Stereo isomerism-Geometrical and optical isomerism (b)Structural isomerism-linkage, coordination, ionisation and solvate isomerism 7.12 Bonding in coordination compounds. (a)Valence bond theory -magnetic properties of coordination compounds-limitations of valence bond theory (b) Crystal field theory (i) Crystal field splitting in octahedral and tetrahedral coordination entities (ii) Colour in coordination compounds-limitations of crystal field theory 7.13 Bonding in metal carbonyls 7.14 Stability of coordination compounds 7.15 Importance and applications of coordination compounds</p>	
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CHAPTER – 8	PERIODS
<p>Chapter 8: POLYMERS</p> <p>8.1 Classification of Polymers -Classification based on source,structure, mode of polymerization, molecular forces and growth polymerization 8.2 Types of polymerization reactions-addition polymerization or chain growth polymerization-ionic polymerization,free radical mechanism-preparation of addition polymers-polythene,teflon and polyacrylonitrile-condensation polymerization or step growth polymerization-polyamides-preparation of Nylon 6,6 and nylon 6-poly esters-terylene-bakelite,melamine,formaldehyde polymer- copolymerization-Rubber-natural rubber-vulcanisation of rubber-Synthetic rubbers-preparation of neoprene and buna-N 8.3 Molecular mass of polymers-number average and weight average molecular masses- poly dispersity index(PDI) 8.4 Biodegradable polymers-PHBV, Nylon 2-nylon 6 8.5 Polymers of commercial importance-poly propene, poly styrene,poly vinyl chloride(PVC), urea-formaldehyde resin, glyptal, bakelite- their monomers, structures and uses</p>	10

CHAPTER – 9	PERIODS
<p>Chapter 9: BIOMOLECULES</p> <p>9.1 Carbohydrates - Classification of carbohydrates-Monosaccharides: preparation of glucose from sucrose and starch- Properties and structure of glucose- D,L and (+), (-) configurations of glucose- Structure of fructose Disaccharides: Sucrose- preparation, structure-Invert sugar- Structures of maltose and lactose-Polysaccharides: Structures of starch</p>	10

<p>cellulose and glycogen- Importance of carbohydrates 9.2 Aminoacids: Natural aminoacids-classification of aminoacids - structures and D and L forms-Zwitter ions Proteins: Structures, classification, fibrous and globular- primary, secondary, tertiary and quarternary structures of proteins- Denaturation of proteins 9.3 Enzymes: Enzymes,mechanism of enzyme action 9.4 Vitamins: Explanation-names- classification of vitamins - sources of vitamins-deficiency diseases of different types of vitamins 9.5. Nucleic acids: chemical composition of nucleic acids ,structures of nucleic acids, DNA finger printing biological functions of nucleic acids 9.6 Hormones:Definition, different types of hormones, their production, biological activity, diseases due to their abnormal activities</p>	
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CHAPTER – 10	PERIODS
<p>Chapter 10: CHEMISTRY IN EVERYDAY LIFE</p> <p>10.1 Drugs and their classification: (a) Classification of drugs on the basis of pharmacological effect(b) Classification of drugs on the basis of drug action (c) Classification of drugs on the basis of chemical structure (d) Classification of drugs on the basis of molecular targets 10.2 Drug-Target interaction-Enzymes as drug targets(a) Catalytic action of enzymes (b) Drug-enzyme interaction Receptors as drug targets 10.3 Therapeutic action of different classes of drugs: antacids, antihistamines, neurologically active drugs: tranquilizers, analgesics–non-narcotic,narcotic analgesics, antimicrobials-antibiotics,antiseptics and disinfectants- antifertility drugs 10.4 Chemicals in food-artificial sweetening agents, food preservatives, antioxidants in food 10.5 Cleansing agents-soaps and synthetic detergents</p>	10
CHAPTER – 11	PERIODS
<p>Chapter 11: HALOALKANES AND HALOARENES</p> <p>11.1 Classification and nomenclature 11.2 Nature of C-X bond 11.3.Methods of preparation : Alkyl halides and aryl halides-from alcohols, from hydrocarbons (a)by free radical halogenation –(b) by electrophilic substitution (c) by replacement of diazonium group(Sand-Meyer reaction) (d) by the addition of hydrogen halides and halogens to alkenes-by halogen exchange(Finkelstein reaction) 11.4 Physical properties-melting and boiling points,density and solubility11.5 Chemical reactions :</p>	10

<p>Reactions of haloalkanes (i) Nucleophilic substitution reactions (a) S_N2 mechanism (b) S_N1 mechanism (c) stereochemical aspects of nucleophilic substitution reactions -optical activity (ii) Elimination reactions (iii) Reaction with metals-Reactions of haloarenes: (i) Nucleophilic substitution (ii) Electrophilic substitution and (iii) Reaction with metals</p> <p>11.6 Polyhalogen compounds: Uses and environmental effects of dichloro methane, trichloromethane, triiodomethane, tetrachloro methane, freons and DDT</p>	
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CHAPTER – 12	PERIODS
<p>Chapter 12:</p> <p>ORGANIC COMPOUNDS CONTAINING C, H AND O (Alcohols, Phenols, Ethers, Aldehydes, Ketones and Carboxylic acids)</p> <p>ALCOHOLS, PHENOLS AND ETHERS</p> <p>12.1 Alcohols, phenols and ethers -classification 12.2 Nomenclature: (a) Alcohols, (b) phenols and (c) ethers 12.3 Structures of hydroxy and ether functional groups 12.4 Methods of preparation: Alcohols from alkenes and carbonyl compounds- Phenols from haloarenes, benzene sulphonic acid, diazonium salts, cumene 12.5 Physical properties of alcohols and phenols 12.6 Chemical reactions of alcohols and phenols (i) Reactions involving cleavage of O-H bond-Acidity of alcohols and phenols, esterification (ii) Reactions involving cleavage of C-O bond- reactions with HX, PX_3, dehydration and oxidation (iii) Reactions of phenols- electrophilic aromatic substitution, Kolbe's reaction, Reimer – Tiemann reaction, reaction with zinc dust, oxidation 12.7 Commercially important alcohols (methanol, ethanol) 12.8 Ethers-Methods of preparation: By dehydration of alcohols, Williamson synthesis- Physical properties-Chemical reactions: Cleavage of C-O bond and electrophilic substitution of aromatic ethers.</p> <p>ALDEHYDES AND KETONES</p> <p>12.9 Nomenclature and structure of carbonyl group 12.10 Preparation of aldehydes and ketones-(1) by oxidation of alcohols (2) by dehydrogenation of alcohols (3) from hydrocarbons -Preparation of aldehydes (1) from acyl chlorides (2) from nitriles and esters (3) from hydrocarbons-Preparation of ketones (1) from acyl chlorides (2) from nitriles (3) from benzene or substituted benzenes 12.11 Physical properties of aldehydes</p>	<p>20</p>

<p>and ketones 12.12 Chemical reactions of aldehydes and ketones- nucleophilic addition, reduction, oxidation, reactions due to - Hydrogen and other reactions (Cannizzaro reaction, electrophilic substitution reaction) 12.13 Uses of aldehydes and ketones</p> <p>CARBOXYLIC ACIDS</p> <p>12.14 Nomenclature and structure of carboxyl group 12.15 Methods of preparation of carboxylic acids- (1) from primary alcohols and aldehydes (2) from alkyl benzenes (3) from nitriles and amides (4) from Grignard reagents (5) from acyl halides and anhydrides (6) from esters 12.16 Physical properties 12.17 Chemical reactions: (i) Reactions involving cleavage of O-H bond-acidity, reactions with metals and alkalis (ii) Reactions involving cleavage of C-OH bond-formation of anhydride, reactions with PCl₅, PCl₃, SOCl₂, esterification and reaction with ammonia (iii) Reactions involving -COOH group-reduction, decarboxylation (iv) Substitution reactions in the hydrocarbon part - halogenation and ring substitution 12.18 Uses of carboxylic acids</p>	
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CHAPTER – 13	PERIODS
<p>Chapter 13: ORGANIC COMPOUNDS CONTAINING NITROGEN</p> <p>I. AMINES</p> <p>13.1 Structure of amines 13.2 Classification 13.3 Nomenclature 13.4 Preparation of amines: reduction of nitro compounds, ammonolysis of alkyl halides, reduction of nitriles, reduction of amides, Gabriel phthalimide synthesis and Hoffmann bromamide degradation reaction. 13.5 Physical properties 13.6 Chemical reactions: basic character of amines, alkylation, acylation, carbyl amine reaction, reaction with nitrous acid, reaction with aryl sulphonyl chloride, electrophilic substitution of aromatic amines- bromination, nitration and sulphonation</p> <p>II. DIAZONIUM SALTS</p> <p>13.7 Methods of preparation of diazonium salts (by diazotization) 13.8 Physical properties 13.9 Chemical reactions: Reactions involving</p> <p>III. CYANIDES AND ISOCYANIDES</p> <p>13.11 Structure and nomenclature of cyanides and isocyanides 13.12 Preparation, physical properties and chemical reactions of cyanides and isocyanides</p>	10

BOARD OF INTERMEDIATE EDUCATION, A.P, HYDERABAD
REVISION OF SYLLABUS
Subject -CHEMISTRY -I (w.e.f. 2012-13)

CHAPTERS	PERIODS
1. ATOMIC STRUCTURE 1.1 Sub- atomic particles 1.2 Atomic models- Rutherford's Nuclear model of atom 1.3 Developments to the Bohr's model of atom 1.3.1 Nature of electromagnetic radiation. 1.3.2 Particle nature of electromagnetic radiation- Planck's quantum theory. 1.4 Bohr's model for Hydrogen atom. 1.4.1 Explanation of line spectrum of hydrogen. 1.4.2 Limitations of Bohr's model 1.5 Quantum mechanical considerations of sub atomic particles. 1.5.1 Dual behaviour of matter. 1.5.2 Heisenberg's uncertainty principle. 1.6 Quantum mechanical model of an atom. Important features of Quantum mechanical model of atom. 1.6.1 Orbitals and quantum numbers. 1.6.2 Shapes of atomic orbitals. 1.6.3 Energies of orbitals. 1.6.4 Filling of orbitals in atoms. Aufbau Principle, Pauli's exclusion Principle and Hund's rule of maximum multiplicity. 1.6.5 Electronic configurations of atoms. 1.6.6 Stability of half filled and completely filled orbitals.	20
2. CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES 2.1 Need to classify elements 2.2 Genesis of periodic classification. 2.3 Modern periodic law and present form of the periodic table. 2.4 Nomenclature of elements with atomic number greater than 100	20

<p>2.5 Electronic configuration of elements and the periodic table</p> <p>2.6 Electronic configuration and types of elements s,p,d.and f blocks.</p> <p>2.7.1 Trends in physical properties: (a) Atomic radius (b) Ionic radius (c)Variation of size in inner transition elements. (d)Ionization enthalpy. (e) Electron gain enthalpy (f) Electro negativity.</p> <p>2.7.2 Periodic trends in chemical properties: (a) Valence or Oxidation states. (b) Anomalous properties of second period elements – diagonal relationship.</p> <p>2.7.3 Periodic trends and chemical reactivity</p>	
<p>3. CHEMICAL BONDING AND MOLECULAR STRUCTURE</p> <p>3.1 Kossel – Lewis approach to chemical bonding.</p> <p>3.2 Ionic or electrovalent bond - Factors favourable for the formation of ionic compounds-Crystal structure of sodium chloride-General properties of ionic compounds.</p> <p>3.3 Bond Parameters – bond length, bond angle, and bond enthalpy, bond order, resonance-Polarity of bonds dipole moment</p> <p>3.4 Valence Shell Electron Pair Repulsion (VSEPR) theories. Predicting the geometry of simple molecules.</p> <p>3.5 Valence bond theory-Orbital overlap concept-Directional properties of bonds-overlapping of atomic orbitals strength of sigma and pi bonds-Factors favouring the formation of covalent bonds</p> <p>3.6 Hybridisation- different types of hybridization involving s, p and d orbitals- shapes of simple covalent molecules.</p> <p>3.7 Coordinate bond –definition with examples.</p>	<p>20</p>

3.8 Molecular orbital theory – Formation of molecular orbitals, Linear combination of atomic orbitals (LCAO)-conditions for combination of atomic orbitals - Energy level diagrams for molecular orbitals -Bonding in some homo nuclear diatomic molecules- $H_2, He_2, Li_2, B_2, C_2, N_2,$ and O_2

3.9 Hydrogen bonding-cause of formation of hydrogen bond- Types of hydrogen bonds-inter and intra molecular-General properties of hydrogen bonds.

4. STATES OF MATTER: GASES AND LIQUIDS

4.1 Intermolecular forces

4.2 Thermal Energy

4.3 Intermolecular forces Vs Thermal interactions.

4.4 The Gaseous State.

4.5 The Gas Laws

4.6 Ideal gas equation.

4.7 Graham's law of diffusion – Dalton's Law of partial pressures.

4.8 Kinetic molecular theory of gases.

4.9 Kinetic gas equation of an ideal gas (No derivation) deduction of gas laws from Kinetic gas equation.

4.10 Distribution of molecular speeds – rms, average and most probable speeds-Kinetic energy of gas molecules.

4.11 Behaviour of real gases – Deviation from Ideal gas behaviour – Compressibility factor Vs Pressure diagrams of real gases.

4.12 Liquefaction of gases

4.13 Liquid State – Properties of Liquids in terms of Inter molecular interactions – Vapour pressure, Viscosity and Surface tension (Qualitative idea only. No mathematical derivation)

<p>5. STOICHIOMETRY</p> <p>5.1 Some Basic Concepts – Properties of matter – uncertainty in Measurement-significant figures, dimensional analysis.</p> <p>5.2 Laws of Chemical Combinations – Law of Conservation of Mass, Law of Definite Proportions, Law of Multiple Proportions, Gay Lussac’s Law of Gaseous Volumes, Dalton’s Atomic Theory, Avogadro Law, Principles, Examples.</p> <p>5.3 Atomic and molecular masses- mole concept and molar mass concept of equivalent weight.</p> <p>5.4 Percentage composition of compounds and calculations of empirical and molecular formulae of compounds.</p> <p>5.5 Stoichiometry and stoichiometric calculations.</p> <p>5.6 Methods of Expressing concentrations of solutions-mass percent, mole fraction, molarity, molality and normality.</p> <p>5.7 Redox reactions-classical idea of redox reactions, oxidation and reduction reactions-redox reactions in terms of electron transfer.</p> <p>5.8 Oxidation number concept.</p> <p>5.9 Types of Redox reactions-combination, decomposition, displacement. and disproportionation reactions</p> <p>5.10 Balancing of redox reactions – oxidation number method Half reaction (ion-electron) method.</p> <p>5.11 Redox reactions in Titrimetry.</p>	<p>15</p>
<p>6. THERMODYNAMICS</p> <p>6.1 Thermodynamic Terms.</p> <p>6.1.1 The system and the surroundings.</p> <p>6.1.2. Types of systems and surroundings.</p> <p>6.1.3 The state of the system.</p> <p>6.1.4 The Internal Energy as a State Function. (a) Work (b) Heat (c) The general case, the first law of Thermodynamics.</p> <p>6.2 Applications.</p>	<p>10</p>

6.2.1 Work

6.2.2 Enthalpy, H- a useful new state function

6.2.3 Extensive and intensive properties.

6.2.4 Heat capacity

6.2.5 The relationship between C_p and C_v .

6.3 Measurement of ΔU and ΔH : Calorimetry

6.4 Enthalpy change, $\Delta_r H$ of reactions – reaction Enthalpy

(a) Standard enthalpy of reactions.

(b) Enthalpy changes during transformations.

(c) Standard enthalpy of formation.

(d) Thermo chemical equations.

(e) Hess's law of constant Heat summation.

6.5 Enthalpies for different types of reactions.

(a) Standard enthalpy of combustion ($\Delta_c H^\circ$)

(b) Enthalpy of atomization ($\Delta_a H^\circ$), phase transition, sublimation and ionization.

(c) Bond Enthalpy ($\Delta_{\text{bond}} H^\circ$)

(d) Enthalpy of solution ($\Delta_{\text{sol}} H^\circ$) and dilution.

6.6 Spontaneity.

(a) Is decrease in enthalpy a criterion for spontaneity?

(b) Entropy and spontaneity, *the second law of thermodynamics.

(c) Gibbs Energy and spontaneity.

6.7 Gibbs Energy change and equilibrium.

6.8 Absolute entropy and the third law of thermodynamics.

7. CHEMICAL EQUILIBRIUM AND ACIDS-BASES

7.1 Equilibrium in Physical process.

7.2 Equilibrium in chemical process – Dynamic Equilibrium

7.3 Law of chemical Equilibrium - Law of mass action and Equilibrium constant.

7.4 Homogeneous Equilibria, Equilibrium constant in gaseous systems. Relationship between K_p and K_c

7.5 Heterogeneous Equilibria.

- 7.6 Applications of Equilibrium constant.
- 7.7 Relationship between Equilibrium constant K , reaction quotient Q and Gibbs energy G .
- 7.8 Factors affecting Equilibria.-Le-chatlieprinciple application to industrial synthesis of Ammonia and Sulphur trioxide.
- 7.9 Ionic Equilibrium in solutions.
- 7.10 Acids, bases and salts- Arrhenius, Bronsted-Lowry and Lewis concepts of acids and bases.
- 7.11 Ionisation of Acids and Bases –Ionisation constant of water and it's ionic product- pH scale-ionisation constants of weak acids-ionisation of weak bases-relation between K_a and K_b -Di and poly basic acids and di and poly acidic Bases-Factors affecting acid strength-Common ion effect in the ionization of acids and bases-Hydrolysis of salts and pH of their solutions.
- 7.12 Buffer solutions-designing of buffer solution-Preparation of Acidic buffer
- 7.13 Solubility Equilibria of sparingly soluble salts. Solubility product constant Common ion effect on solubility of Ionic salts.

8. HYDROGEN AND ITS COMPOUNDS

- 8.1 Position of hydrogen in the periodic table.
- 8.2 Dihydrogen-Occurance and Isotopes.
- 8.3 Preparation of Dihydrogen
- 8.4 Properties of Dihydrogen
- 8.5 Hydrides: Ionic, covalent, and non-stoichiometric hydrides.
- 8.6 Water: Physical properties; structure of water, ice.
Chemical properties of water; hard and soft water
Temporary and permanent hardness of water
- 8.7 Hydrogen peroxide: Preparation; Physical properties; structure and chemical properties; storage and uses.
- 8.8 Heavy Water
- 8.9 Hydrogen as a fuel.

9. THE s – BLOCK ELEMENTS

08

(ALKALI AND ALKALINE EARTH METALS)

Group 1 Elements

9.1 Alkali metals; Electronic configurations;

Atomic and Ionic radii; Ionization enthalpy; Hydration enthalpy; Physical properties; Chemical properties; Uses

9.2 General characteristics of the compounds of the alkali metals: Oxides; Halides; Salts of Oxy Acids.

9.3 Anomalous properties of Lithium:

Differences and similarities with other alkali metals.

Diagonal relationship; similarities between Lithium and Magnesium.

9.4 Some important compounds of Sodium:

Sodium Carbonate; Sodium Chloride; Sodium Hydroxide; Sodium hydrogen carbonate.

9.5 Biological importance of Sodium and Potassium.

Group 2 Elements:

9.6 Alkaline earth elements; Electronic configuration; Ionization enthalpy; Hydration enthalpy; Physical properties, Chemical properties; Uses.

9.7 General characteristics of compounds of the Alkaline Earth Metals: Oxides, hydroxides, halides, salts of Oxyacids (Carbonates; Sulphates and Nitrates).

9.8 Anomalous behavior of Beryllium; its diagonal relationship with Aluminum.

9.9 Some important compounds of calcium:

Preparation and uses of Calcium Oxide ; Calcium Hydroxide; Calcium Carbonate;Plaster of Paris; Cement.

9.10 Biological importance of Calcium and Magnesium.

<p>10. P- BLOCK ELEMENTS GROUP 13 (BORON FAMILY)</p> <p>10.1 General introduction – Electronic configuration, Atomic radii, Ionization enthalpy, Electro negativity; Physical & Chemical properties.</p> <p>10.2 Important trends and anomalous properties of boron.</p> <p>10.3 Some important compounds of boron – Borax, Ortho boric acid,diborane.</p> <p>10.4 Uses of boron, aluminium and their compounds.</p>	<p>08</p>
<p>11. p-BLOCK ELEMENTS - GROUP 14 (CARBON FAMILY)</p> <p>11.1 General introduction - Electronic configuration, Atomic radii, Ionization enthalpy, Electro negativity; Physical & Chemical properties.</p> <p>11.2 Important trends and anomalous properties of carbon.</p> <p>11.3 Allotropes of carbon.</p> <p>11.4 Uses of carbon.</p> <p>11.5 Some important compounds of carbon and silicon – carbonmonoxide, carbon dioxide,Silica, silicones, silicates and zeolites.</p>	<p>08</p>
<p>12. ENVIRONMENTAL CHEMISTRY</p> <p>12.1 Definition of terms: Air, Water and Soil Pollutions.</p> <p>12.2 Environmental Pollution</p> <p>12.3 Atmospheric pollution; Tropospheric Pollution; Gaseous Air Pollutants (Oxides of Sulphur; Oxides of Nitrogen; Hydro Carbons; Oxides of Carbon (CO; CO₂)). Global warming and Green house effect.</p> <p>12.4 Acid Rain- Particulate Pollutants- Smog.</p> <p>12.5 Stratospheric Pollution: Formation and breakdown of Ozone- Ozone hole- effects of depletion of the Ozone layer.</p>	<p>08</p>

12.6 Water Pollution: Causes of Water Pollution; International standards for drinking water.

12.7 Soil Pollution: Pesticides, Industrial Wastes.

12.8 Strategies to control environmental pollution- waste Management- collection and disposal.

12.9 Green Chemistry: Green chemistry in day-to-day life; Dry cleaning of clothes; Bleaching of paper; Synthesis of chemicals

13. ORGANIC CHEMISTRY-SOME BASIC PRINCIPLES AND TECHNIQUES AND HYDROCARBONS

13.1 General introduction.

13.2 Tetravalency of Carbon: shapes of organic compounds.

13.3 Structural representations of organic compounds.

13.4 Classification of organic compounds.

13.5 Nomenclature of organic compounds.

13.6 Isomerism.

13.7 Fundamental concepts in organic reaction mechanisms.

13.7.1 Fission of covalent bond.

13.7.2 Nucleophiles and electrophiles.

13.7.3 Electron movements in organic reactions.

13.7.4 Electron displacement effects in covalent bonds.

13.7.5 Types of Organic reactions.

13.8 Methods of purification of organic compounds.

13.9 Qualitative elemental analysis of organic compounds.

13.10 Quantitative elemental analysis of organic compounds.

HYDROCARBONS

13.11 Classification of Hydrocarbons.

13.12 Alkanes – Nomenclature, isomerism (structural and conformations of ethane only)

13.12.1 Preparation of alkanes

13.12.2 Properties – Physical properties and chemical Reactivity, Substitution reactions – Halogenation (free radical mechanism), Combustion, Controlled

<p>Oxidation, Isomerisation, Aromatization, reaction with steam and Pyrolysis.</p> <p>13.13 Alkenes- Nomenclature, structure of ethane, Isomerism (structural and geometrical).</p> <p>13.13.1 Methods of preparation.</p> <p>13.13.2 Properties- Physical and chemical reactions: Addition of Hydrogen, halogen, water, sulphuric acid, Hydrogen halides (Mechanism- ionic and peroxide effect, Markovnikov's , antiMarkovnikov's or Kharasch effect). Oxidation, Ozonolysis and Polymerization.</p> <p>13.14 Alkynes – Nomenclature and isomerism, structure of acetylene. Methods of preparation of acetylene.</p> <p>13.14.1 Physical properties, Chemical reactions- acidic character of acetylene, addition reactions- of hydrogen, Halogen, Hydrogen halides and water. Polymerization.</p> <p>13.15 Aromatic Hydrocarbons: Nomenclature and isomerism. Structure of benzene, Resonance and aromaticity.</p> <p>13.15.1 Preparation of benzene. Physical properties. Chemical properties: Mechanism of electrophilic substitution. Electrophilic substitution reactions- Nitration, Sulphonation, Halogenation, Friedel-Craft' alkylation and acylation.</p> <p>13.15.2 Directive influence of functional groups in mono substituted benzene, Carcinogenicity and toxicity.</p> <p style="text-align: right;">TOTAL PERIODS</p>	<p>180</p>
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Subject – MATHEMATICS –IA (w.e.f. 2012-13)

CHAPTERS	PERIODS
<u>ALGEBRA</u>	
1 <u>Functions :</u> 1.1 Types of functions – Definitions. 1.2 Inverse functions and Theorems. 1.3 Domain, Range, Inverse of real valued functions.	16
2 <u>Mathematical Induction</u> 2.1 Principle of Mathematical Induction & Theorems. 2.2 Applications of Mathematical Induction. 2.3 Problems on divisibility.	08
03. <u>Matrices:</u> 3.1 Types of matrices 3.2 Scalar multiple of a matrix and multiplication of matrices 3.3 Transpose of a matrix 3.4 Determinants 3.5 Adjoint and Inverse of a matrix 3.6 Consistency and inconsistency of Equations- Rank of a matrix 3.7 Solution of simultaneous linear equations	28
<u>VECTOR ALGEBRA</u>	
4. <u>Addition of Vectors :</u> 4.1 Vectors as a triad of real numbers. 4.2 Classification of vectors. 4.3 Addition of vectors.	18

<p>4.4 Scalar multiplication.</p> <p>4.5 Angle between two non zero vectors.</p> <p>4.6 Linear combination of vectors.</p> <p>4.7 Component of a vector in three dimensions.</p> <p>4.8 Vector equations of line and plane including their Cartesian equivalent forms.</p> <p>5 <u>Product of Vectors</u> :</p> <p>5.1 Scalar Product - Geometrical Interpretations - orthogonal projections.</p> <p>5.2 Properties of dot product.</p> <p>5.3 Expression of dot product in i, j, k system - Angle between two vectors.</p> <p>5.4 Geometrical Vector methods.</p> <p>5.5 Vector equations of plane in normal form.</p> <p>5.6 Angle between two planes.</p> <p>5.7 Vector product of two vectors and properties.</p> <p>5.8 Vector product in i, j, k system.</p> <p>5.9 Vector Areas.</p> <p>5.10 Scalar Triple Product.</p> <p>5.11 Vector equations of plane in different forms, skew lines, shortest distance and their Cartesian equivalents. Plane through the line of intersection of two planes, condition for coplanarity of two lines, perpendicular distance of a point from a plane, Angle between line and a plane. Cartesian equivalents of all these results</p> <p>5.12 Vector Triple Product – Results</p>	<p>28</p>
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<u>TRIGONOMETRY</u>	
6 <u>Trigonometric Ratios up to Transformations</u> :	20
6.1 Graphs and Periodicity of Trigonometric functions.	
6.2 Trigonometric ratios and Compound angles.	
6.3 Trigonometric ratios of multiple and sub-multiple angles.	
6.4 Transformations - Sum and Product rules.	
7 <u>Trigonometric Equations</u> :	
7.1 General Solution of Trigonometric Equations.	05
7.2 Simple Trigonometric Equations – Solutions.	
8 <u>Inverse Trigonometric Functions</u> :	
8.1 To reduce a Trigonometric Function into a bijection.	07
8.2 Graphs of Inverse Trigonometric Functions.	
8.3 Properties of Inverse Trigonometric Functions.	
9 <u>Hyperbolic Functions</u> :	
9.1 Definition of Hyperbolic Function – Graphs.	
9.2 Definition of Inverse Hyperbolic Functions – Graphs.	04
9.3 Addition formulas of Hyperbolic Functions.	
10 <u>Properties of Triangles</u> :	
10.1 Relation between sides and angles of a Triangle	
10.2 Sine, Cosine, Tangent and Projection rules.	
10.3 Half angle formulae and areas of a triangle	16
10.4 In-circle and Ex-circle of a Triangle.	
TOTAL	150

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Subject: MATHEMATICS -IB
(w.e.f.2012-13)

CHAPTERS	PERIODS
<u>COORDINATE GEOMETRY</u>	
1 <u>Locus</u> :	08
1.1 Definition of locus – Illustrations.	
1.2 To find equations of locus - Problems connected to it.	
2 <u>Transformation of Axes</u> :	08
2.1 Transformation of axes - Rules, Derivations and Illustrations.	
2.2 Rotation of axes - Derivations – Illustrations.	
3 <u>The Straight Line</u> :	25
3.1 Revision of fundamental results.	
3.2 Straight line - Normal form – Illustrations.	
3.3 Straight line - Symmetric form.	
3.4 Straight line - Reduction into various forms.	
3.5 Intersection of two Straight Lines.	
3.6 Family of straight lines - Concurrent lines.	
3.7 Condition for Concurrent lines.	
3.8 Angle between two lines.	
3.9 Length of perpendicular from a point to a Line.	
3.10 Distance between two parallel lines.	
3.11 Concurrent lines - properties related to a triangle.	
4 <u>Pair of Straight lines</u> :	24
4.1 Equations of pair of lines passing through origin, angle between a pair of lines.	
4.2 Condition for perpendicular and coincident lines, bisectors of angles.	
4.3 Pair of bisectors of angles.	
4.4 Pair of lines - second degree general equation.	

4.5	Conditions for parallel lines - distance between them, Point of intersection of pair of lines.	
4.6	Homogenizing a second degree equation with a first degree equation in X and Y.	
5	<u>Three Dimensional Coordinates</u> :	04
5.1	Coordinates.	
5.2	Section formulas - Centroid of a triangle and tetrahedron.	
6	<u>Direction Cosines and Direction Ratios</u> :	10
6.1	Direction Cosines.	
6.2	Direction Ratios.	
7	<u>Plane</u> :	04
7.1	Cartesian equation of Plane - Simple Illustrations.	
<u>CALCULUS</u>		
8.	<u>Limits and Continuity:</u>	
8.1	Intervals and neighborhoods.	
8.2	Limits.	15
8.3	Standard Limits.	
8.4	Continuity.	
9	<u>Differentiation</u> :	24
9.1	Derivative of a function.	
9.2	Elementary Properties.	
9.3	Trigonometric, Inverse Trigonometric, Hyperbolic, Inverse Hyperbolic Function - Derivatives.	
9.4	Methods of Differentiation.	
9.5	Second Order Derivatives.	
10	<u>Applications of Derivatives:</u>	28
10.1	Errors and approximations.	
10.2	Geometrical Interpretation of a derivative.	

10.3	Equations of tangents and normals.	
10.4	Lengths of tangent, normal, sub tangent and normal.	sub
10.5	Angles between two curves and condition for orthogonality of curves.	
10.6	Derivative as Rate of change.	
10.7	Rolle's Theorem and Lagrange's Mean value theorem without proofs and their geometrical interpretation.	
10.8	Increasing and decreasing functions.	
10.9	Maxima and Minima.	
TOTAL		150

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Subject – PHYSICS-II (w.e.f 2013-14)

CHAPTER - 1	PERIODS
Chapter ONE: WAVES 1.1 INTRODUCTION 1.2 Transverse and longitudinal waves 1.3 Displacement relation in a progressive wave 1.4 The speed of a travelling wave 1.5 The principle of superposition of waves 1.6 Reflection of waves 1.7 Beats 1.8 Doppler effect	12

CHAPTER - 2	PERIODS
Chapter TWO: RAY OPTICS AND OPTICAL INSTRUMENTS 2.1 INTRODUCTION 2.2 Reflection of Light by Spherical Mirrors 2.3 Refraction 2.4 Total Internal Reflection 2.5 Refraction at Spherical Surfaces and by Lenses 2.6 Refraction through a Prism 2.7 Dispersion by a Prism 2.8 Some Natural Phenomena due to Sunlight 2.9 OPTICAL INSTRUMENTS	08

CHAPTER - 3	PERIODS
Chapter THREE: WAVE OPTICS 3.1 Introduction 3.2 Huygens Principle 3.3 Refraction and reflection of plane waves using Huygens Principle 3.4 Coherent and Incoherent Addition of Waves 3.5 Interference of Light Waves and Young's Experiment 3.6 Diffraction 3.7 Polarisation	08

CHAPTER - 4	PERIODS
<p>Chapter FOUR: ELECTRIC CHARGES AND FIELDS</p> <p>4.1 INTRODUCTION</p> <p>4.2 Electric Charges</p> <p>4.3 Conductors and Insulators</p> <p>4.4 Charging by Induction</p> <p>4.5 Basic Properties of Electric Charge</p> <p>4.6 Coulomb's Law</p> <p>4.7 Forces between Multiple Charges</p> <p>4.8 Electric Field</p> <p>4.9 Electric Field Lines</p> <p>4.10 Electric Flux</p> <p>4.11 Electric Dipole</p> <p>4.12 Dipole in a Uniform External Field</p> <p>4.13 Continuous Charge Distribution</p> <p>4.14 Gauss's Law</p> <p>4.15 Application of Gauss's Law</p>	12

CHAPTER - 5	PERIODS
<p>Chapter FIVE:</p> <p>ELECTROSTATIC POTENTIAL AND CAPACITANCE</p> <p>5.1 INTRODUCTION</p> <p>5.2 Electrostatic Potential</p> <p>5.3 Potential due to a Point Charge</p> <p>5.4 Potential due to an Electric Dipole</p> <p>5.5 Potential due to a System of Charges</p> <p>5.6 Equipotential Surfaces</p> <p>5.7 Potential Energy of a System of Charges</p> <p>5.8 Potential Energy in an External Field</p> <p>5.9 Electrostatics of Conductors</p> <p>5.10 Dielectrics and Polarisation</p> <p>5.11 Capacitors and Capacitance</p> <p>5.12 The Parallel Plate Capacitor</p> <p>5.13 Effect of Dielectric on Capacitance</p> <p>5.14 Combination of Capacitors</p> <p>5.15 Energy Stored in a Capacitor</p> <p>5.16 Van de Graaff Generator</p>	12

CHAPTER - 6	PERIODS
<p>Chapter SIX: CURRENT ELECTRICITY</p> <p>6.1 INTRODUCTION</p> <p>6.2 Electric Current</p> <p>6.3 Electric Currents in Conductors</p> <p>6.4 Ohm's law</p> <p>6.5 Drift of Electrons and the Origin of Resistivity</p> <p>6.6 Limitations of Ohm's Law</p> <p>6.7 Resistivity of various Materials</p> <p>6.8 Temperature Dependence of Resistivity</p> <p>6.9 Electrical Energy, Power</p> <p>6.10 Combination of Resistors — Series and Parallel</p> <p>6.11 Cells, emf, Internal Resistance</p> <p>6.12 Cells in Series and in Parallel</p> <p>6.13 Kirchhoff's Laws</p> <p>6.14 Wheatstone Bridge</p> <p>6.15 Meter Bridge</p> <p>6.16 Potentiometer</p>	12

CHAPTER – 7	PERIODS
<p>Chapter SEVEN:</p> <p>MOVING CHARGES AND MAGNETISM</p> <p>7.1 INTRODUCTION</p> <p>7.2 Magnetic Force</p> <p>7.3 Motion in a Magnetic Field</p> <p>7.4 Motion in Combined Electric and Magnetic Fields</p> <p>7.5 Magnetic Field due to a Current Element, Biot-Savart Law</p> <p>7.6 Magnetic Field on the Axis of a Circular Current Loop</p> <p>7.7 Ampere's Circuital Law</p> <p>7.8 The Solenoid and the Toroid</p> <p>7.9 Force between Two Parallel Currents, the Ampere</p> <p>7.10 Torque on Current Loop, Magnetic Dipole</p> <p>7.11 The Moving Coil Galvanometer</p>	12

CHAPTER – 8	PERIODS
<p>Chapter EIGHT: MAGNETISM AND MATTER</p> <p>8.1 INTRODUCTION 8.2 The Bar Magnet 8.3 Magnetism and Gauss’s Law 8.4 The Earth’s Magnetism 8.5 Magnetisation and Magnetic Intensity 8.6 Magnetic Properties of Materials 8.7 Permanent Magnets and Electromagnets</p>	08

CHAPTER – 9	PERIODS
<p>Chapter NINE: ELECTROMAGNETIC INDUCTION</p> <p>9.1 INTRODUCTION 9.2 The Experiments of Faraday and Henry 9.3 Magnetic Flux 9.4 Faraday’s Law of Induction 9.5 Lenz’s Law and Conservation of Energy 9.6 Motional Electromotive Force 9.7 Energy Consideration: A Quantitative Study 9.8 Eddy Currents 9.9 Inductance 9.10 AC Generator</p>	08

CHAPTER – 10	PERIODS
<p>Chapter TEN: ALTERNATING CURRENT</p> <p>10.1 INTRODUCTION 10.2 AC Voltage Applied to a Resistor 10.3 Representation of AC Current and Voltage by Rotating Vectors — Phasors 10.4 AC Voltage Applied to an Inductor 10.5 AC Voltage Applied to a Capacitor 10.6 AC Voltage Applied to a Series LCR Circuit 10.7 Power in AC Circuit: The Power Factor 10.8 LC Oscillations 10.9 Transformers</p>	08

CHAPTER – 11	PERIODS
Chapter ELEVEN: ELECTROMAGNETIC WAVES 11.1 INTRODUCTION 11.2 Displacement Current 11.3 Electromagnetic Waves 11.4 Electromagnetic Spectrum	08

CHAPTER – 12	PERIODS
Chapter TWELVE: DUAL NATURE OF RADIATION AND MATTER 12.1 INTRODUCTION 12.2 Electron Emission 12.3 Photoelectric Effect 12.4 Experimental Study of Photoelectric Effect 12.5 Photoelectric Effect and Wave Theory of Light 12.6 Einstein's Photoelectric Equation: Energy Quantum of Radiation 12.7 Particle Nature of Light: The Photon 12.8 Wave Nature of Matter 12.9 Davisson and Germer Experiment	08

CHAPTER – 13	PERIODS
Chapter THIRTEEN: ATOMS 13.1 INTRODUCTION 13.2 Alpha-particle Scattering and Rutherford's Nuclear Model of Atom 13.3 Atomic Spectra 13.4 Bohr Model of the Hydrogen Atom 13.5 The Line Spectra of the Hydrogen Atom 13.6 DE Broglie's Explanation of Bohr's Second Postulate of Quantisation	08

CHAPTER – 14	PERIODS
<p>Chapter FOURTEEN: NUCLEI</p> <p>14.1 INTRODUCTION 14.2 Atomic Masses and Composition of Nucleus 14.3 Size of the Nucleus 14.4 Mass-Energy and Nuclear Binding Energy 14.5 Nuclear Force 14.6 Radioactivity 14.7 Nuclear Energy</p>	08

CHAPTER – 15	PERIODS
<p>Chapter FIFTEEN: SEMICONDUCTOR ELECTRONICS: MATERIALS, DEVICES AND SIMPLE CIRCUITS</p> <p>15.1 INTRODUCTION 15.2 Classification of Metals, Conductors and Semiconductors 15.3 Intrinsic Semiconductor 15.4 Extrinsic Semiconductor 15.5 p-n Junction 15.6 Semiconductor diode 15.7 Application of Junction Diode as a Rectifier 15.8 Special Purpose p-n Junction Diodes 15.9 Junction Transistor 15.10 Digital Electronics and Logic Gates 15.11 Integrated Circuits</p>	08

CHAPTER – 16	PERIODS
<p>Chapter SIXTEEN: COMMUNICATION SYSTEMS</p> <p>16.1 INTRODUCTION 16.2 Elements of a Communication System 16.3 Basic Terminology Used in Electronic Communication Systems 16.4 Bandwidth of Signals 16.5 Bandwidth of Transmission Medium 16.6 Propagation of Electromagnetic Waves 16.7 Modulation and its Necessity 16.8 Amplitude Modulation 16.9 Production of Amplitude Modulated Wave 16.10 Detection of Amplitude Modulated Wave</p>	04

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Subject - PHYSICS-I (w.e.f 2012-13)

CHAPTER-I	PERIODS
C H A P T E R 1 PHYSICAL WORLD 1.1 What is physics? 1.2 Scope and excitement of physics 1.3 Physics, technology and society 1.4 Fundamental forces in nature 1.5 Nature of physical laws	4

CHAPTER-II	PERIODS
C H A P T E R 2 UNITS AND MEASUREMENTS 2.1 Introduction 2.2 The international system of units 2.3 Measurement of length 2.4 Measurement of mass 2.5 Measurement of time 2.6 Accuracy, precision of instruments and errors in measurement 2.7 Significant figures 2.8 Dimensions of physical quantities 2.9 Dimensional formulae and dimensional equations 2.10 Dimensional analysis and its applications	9

CHAPTER-III	PERIODS
C H A P T E R 3 MOTION IN A STRAIGHT LINE 3.1 Introduction	10

3.2 Position, path length and displacement 3.3 Average velocity and average speed 3.4 Instantaneous velocity and speed 3.5 Acceleration 3.6 Kinematic equations for uniformly accelerated motion 3.7 Relative velocity	
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CHAPTER-IV	PERIODS
C H A P T E R 4 MOTION IN A PLANE 4.1 Introduction 4.2 Scalars and vectors 4.3 Multiplication of vectors by real numbers 4.4 Addition and subtraction of vectors. graphical method 4.5 Resolution of vectors 4.6 Vector addition. analytical method 4.7 Motion in a plane 4.8 Motion in a plane with constant acceleration 4.9 Relative velocity in two dimensions 4.10 Projectile motion 4.11 Uniform circular motion	14

CHAPTER-V	PERIODS
C H A P T E R 5 LAWS OF MOTION 5.1 Introduction 5.2 Aristotle's fallacy 5.3 The law of inertia 5.4 Newton's first law of motion 5.5 Newton's second law of motion	16

5.6 Newton's third law of motion	
5.7 Conservation of momentum	
5.8 Equilibrium of a particle	
5.9 Common forces in mechanics, friction	
5.10 Circular motion	
5.11 Solving problems in mechanics	

CHAPTER-VI	PERIODS
C H A P T E R 6 WORK, ENERGY AND POWER 6.1 Introduction 6.2 Notions of work and kinetic energy : The work-energy theorem 6.3 Work 6.4 Kinetic energy 6.5 Work done by a variable force 6.6 The work-energy theorem for a variable force 6.7 The concept of potential energy 6.8 The conservation of mechanical energy 6.9 The potential energy of a spring 6.10 Various forms of energy : the law of conservation of energy 6.11 Power 6.12 Collisions	18

CHAPTER-VII	PERIODS
C H A P T E R 7 SYSTEM OF PARTICLES AND ROTATIONAL MOTION 7.1 Introduction 7.2 Centre of mass, Centre of Gravity 7.3 Motion of centre of mass	19

<p>7.4 Linear momentum of a system of particles</p> <p>7.5 Vector product of two vectors</p> <p>7.6 Angular velocity and its relation with linear velocity, Kinematics of rotational motion about a fixed axis</p> <p>7.7 Torque and angular momentum</p> <p>7.8 Equilibrium of a rigid body</p> <p>7.9 Moment of inertia</p> <p>7.10 Theorems of perpendicular and parallel axes</p> <p>7.11 Dynamics of rotational motion about a fixed axis</p> <p>7.12 Angular momentum in case of rotations about a fixed axis</p> <p>7.13 Rolling motion</p>	
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CHAPTER-VIII	PERIODS
<p>C H A P T E R 8</p> <p>OSCILLATIONS</p> <p>8.1 Introduction</p> <p>8.2 Periodic and oscillatory motions</p> <p>8.3 Simple harmonic motion</p> <p>8.4 Simple harmonic motion and uniform circular motion</p> <p>8.5 Velocity and acceleration in simple harmonic motion</p> <p>8.6 Force law for Simple harmonic Motion</p> <p>8.7 Energy in simple harmonic motion</p> <p>8.8 Some systems executing Simple Harmonic Motion</p> <p>8.9 Damped simple harmonic motion</p> <p>8.10 Forced oscillations and resonance</p>	12

CHAPTER-IX	PERIODS
C H A P T E R 9 GRAVITATION 9.1 Introduction 9.2 Kepler's laws 9.3 Universal law of gravitation 9.4 The gravitational constant 9.5 Acceleration due to gravity of the earth 9.6 Acceleration due to gravity below and above the surface of earth 9.7 Gravitational potential energy 9.8 Escape speed 9.9 Earth satellite 9.10 Energy of an orbiting satellite 9.11 Geostationary and polar satellites 9.12 Weightlessness	12

CHAPTER-X	PERIODS
C H A P T E R 10 Mechanical Properties of Solids 10.1 Introduction 10.2 Elastic behaviour of solids 10.3 Stress and strain 10.4 Hooke's law 10.5 Stress-strain curve 10.6 Elastic moduli 10.7 Applications of elastic behaviour of materials	10

CHAPTER-XI	PERIODS
C H A P T E R 11 MECHANICAL PROPERTIES OF FLUIDS 11.1 Introduction 11.2 Pressure 11.3 Streamline flow 11.4 Bernoulli's principle 11.5 Viscosity 11.6 Reynolds number 11.7 Surface tension	12

CHAPTER-XII	PERIODS
C H A P T E R 12 THERMAL PROPERTIES OF MATTER 12.1 Introduction 12.2 Temperature and heat 12.3 Measurement of temperature 12.4 Ideal-gas equation and absolute temperature 12.5 Thermal expansion 12.6 Specific heat capacity 12.7 Calorimetry 12.8 Change of state 12.9 Heat transfer 12.10 Newton's law of cooling	16

CHAPTER-XIII	PERIODS
C H A P T E R 13 THERMODYNAMICS 13.1 Introduction 13.2 Thermal equilibrium 13.3 Zeroth law of thermodynamics 13.4 Heat, internal energy and work 13.5 First law of thermodynamics	18

13.6 Specific heat capacity 13.7 Thermodynamic state variables and equation of State 13.8 Thermodynamic processes 13.9 Heat engines 13.10 Refrigerators and heat pumps 13.11 Second law of thermodynamics 13.12 Reversible and irreversible processes 13.13 Carnot engine, Carnot's theorem	
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CHAPTER-XIV	PERIODS
C H A P T E R 14 KINETIC THEORY 14.1 Introduction 14.2 Molecular nature of matter 14.3 Behaviour of gases 14.4 Kinetic theory of an ideal gas 14.5 Law of equipartition of energy 14.6 Specific heat capacity 14.7 Mean free path	10
TOTAL	180

BOARD OF INTERMEDIATE EDUCATION, AP., HYDERABAD
Revision of Intermediate I Year Syllabus
Subject – Zoology-I Syllabus(2012-13)

UNIT-I	PERIODS
<p style="text-align: center;">UNIT- I: ZOOLOGY – Diversity of Living World</p> <p>1.1 What is life?</p> <p>1.2 Nature, Scope & meaning of zoology</p> <p>1.3 Branches of Zoology</p> <p>1.4 Need for classification- Zoos as tools for the study of taxonomy</p> <p>1.5 Basic principles of Classification: Biological system of classification- (Phylogenetic classification only)</p> <p>1.6 Levels or Hierarchy of classification</p> <p>1.7 Nomenclature – Bi & Trinominal</p> <p>1.8 Species concept</p> <p>1.9 Kingdom Animalia</p> <p>1.10 Biodiversity – Meaning and distribution (Genetic diversity, Species diversity, Ecosystem diversity(alpha,beta and gama), other attributes of biodiversity, role of biodiversity, threats to biodiveristy, methods of conservation, IUCN Red data books, Conservation of wild life in India – Legislation, Preservation, Organisations, Threatened species..</p>	16

UNIT-II		PERIODS
UNIT- II: STRUCTURAL ORGANIZATION IN ANIMALS		18
2.1	Levels of organization, Multicellularity: Diploblastic & Triploblastic conditions	
2.2	Asymmetry, Symmetry: Radial symmetry, and Bilateral symmetry (Brief account giving one example for each type from the representative phyla)	
2.3	Acoelomates, Pseudocoelomates and Eucoelomates :- Schizo & Entero coelomates (Brief account of formation of coelom)	
2.4	Tissues: Epithelial, Connective, Muscular and Nervous tissues. (make it a little more elaborative)	

UNIT - III		PERIODS
UNIT- III: ANIMAL DIVERSITY - I: INVERTEBRATE PHyla		18
General Characters – Strictly restrict to 8 salient features only		
Classification up to Classes with two or three examples – Brief account only		
3.1	Porifera	
3.2	Cnidaria	
3.3	Ctenophora	
3.4	Platyhelminthes	
3.5	Nematoda	
3.6	Annelida (Include Earthworm as a type study strictly adhering to NCERT text book)	
3.7	Arthropoda	
3.8	Mollusca	
3.9	Echinodermata	
3.10	Hemichordata	

UNIT-IV	PERIODS
<p style="text-align: center;">UNIT- IV: ANIMAL DIVERSITY - II: PHYLUM : CHORDATA</p> <p>General Characters – Strictly restrict to 8 points only Classification up to Classes - Brief account only with two or three examples</p> <p>4.0 Phylum : Chordata</p> <p>4.1 Sub phylum: Urochordata</p> <p>4.2 Sub phylum: Cephalochordata</p> <p>4.3 Sub phylum : Vertebrata</p> <p>4.4 Super class: Agnatha</p> <p>4.4.1 Class Cyclostomata</p> <p>4.5 Super class: Gnathostomata</p> <p>4.5.1 Super class pisces</p> <p>4.5.2 Class: Chondrichthyes</p> <p>4.5.3 Class: Osteichthyes</p> <p>4.6 Tetrapoda</p> <p>4.6.1 Class: Amphibia (Include Frog as a type study strictly adhering to NCERT text book)</p> <p>4.6.2 Class: Reptilia</p> <p>4.6.3 Class: Aves</p> <p>4.6.4 Class: Mammalia</p>	18

UNIT-V	PERIODS
<p style="text-align: center;">UNIT- V: LOCOMOTION & REPRODUCTION IN PROTOZOA</p> <p>5.1 Locomotion: Definition, types of locomotor structures pseudopodia (basic idea of pseudopodia without going into different types), flagella & cilia (Brief account giving two examples each)</p> <p>5.2 Flagellar & Ciliary movement – Effective & Recovery strokes in <i>Euglena</i>, Synchronal & Metachronal movements in Paramecium.</p>	12

5.3	Reproduction: Definition, types. Asexual Reproduction: Transeverse binary fission in <i>Paramecium</i> & Longitudinal binary fission in <i>Euglena</i> . Multiple fission,	
5.4	Sexual Reproduction.	

UNIT-VI		PERIODS
UNIT- VI: BIOLOGY & HUMAN WELFARE (25 pages only)		20
6.1	Parasitism and parasitic adaptation	
6.2	Health and disease: introduction (follow NCERT) Life cycle, Pathogenecity, Treatment & Prevention (Brief account only) 1 <i>Entamoeba histolytica</i> 2 <i>Plasmodium vivax</i> 3 <i>Ascaris lumbricoides</i> .4 <i>Wuchereria bancrofti</i>	
6.3	Brief account of pathogenecity, treatment & prevention of Typhoid, Pneumonia, Common cold, & Ring worm.	
6.4	Drugs and Alcohol absuse	

UNIT-VII	PERIODS
<p>UNIT- VII: Type study of Periplaneta americana</p> <p>7.1 Habitat and habits</p> <p>7.2 External features</p> <p>7.3 Locomotion</p> <p>7.4 Digestive system</p> <p>7.5 Respiratory system</p> <p>7.6 Circulatory system</p> <p>7.7 Excretory system</p> <p>7.8 Nervous system – sense organs, structure of ommatidium.</p> <p>7.9 Reproductive system</p>	15

UNIT-VIII	PERIODS
<p>UNIT- VIII: ECOLOGY & ENVIRONMENT</p> <p>8.1 Organisms and Environment: Ecology, population, communities, habitat, niche, biome and ecosphere (definitions only)</p> <p>8.2 Ecosystem: Elementary aspects only Abiotic factors- Light, Temperature & Water (Biological effects only), Ecological adaptations</p> <p>8.3 Population interactions</p> <p>8.4 Ecosystems: Types, Components, Lake ecosystem</p> <p>8.5 Food chains, Food web, Productivity and Energy flow in Ecosystem, Ecological pyramids – Pyramids of numbers, biomass and energy.</p> <p>8.6 Nutrient cycling – Carbon, Nitrogen, & Phosphorous cycles (Brief account)</p> <p>8.7 Population attributes: Growth, Natality and Mortality, Age distribution, Population regulation.</p> <p>8.8 Environmental issues</p>	40

157 PERIODS

Guidelines to authors:

1. In addition you may include a few local examples for better understanding examples cited in NCERT text books for all topics.
2. Topics to be dealt on par with NCERT text books.
3. Vision of the topic to be included at the beginning to stimulate the thinking of the students.
4. Very short, short, and long answer type of questions have to be given at the end of each chapter as model questions keeping the weightage in mind.
5. For every unit a back ground of the pioneering scientists (preferably of Indian origin) and his contributions may be included at the beginning to motivate students This is additional information and to be marked as "Not for Evaluation".
6. Try to present the content in simple language and lucid style wherever the subject matter is to be written afresh.
7. Get the key words typed in bold.
8. Type all scientific names in italics.
9. Coloured 'corolla' diagrams are to be incorporated wherever necessary.
10. Glossary: write precisely, if necessary adopt the relevant terms from standard text books.

Minimize the number. Do not exceed 3 sentences.

BOARD OF INTERMEDIATE EDUCATION, A.P., HYDERABAD

REVISION OF SYLLABUS

Subject – ZOOLOGY-II (w.e.f 2013-14)

UNIT-I Human Anatomy and Physiology-I	PERIODS
<p>Unit I A: Digestion and absorption</p> <p>Alimentary canal and digestive glands; Role of digestive enzymes and gastrointestinal hormones; Peristalsis, digestion, absorption and assimilation of proteins, carbohydrates and fats, egestion, Calorific value of proteins, carbohydrates and fats (for box item-not to be evaluated); Nutritional disorders: Protein Energy Malnutrition (PEM), indigestion, constipation, vomiting, jaundice, diarrhea, Kwashiorkor.</p> <p>Unit I B: Breathing and Respiration</p> <p>Respiratory organs in animals; Respiratory system in humans; Mechanism of breathing and its regulation in humans - Exchange of gases, transport of gases and regulation of respiration; Respiratory volumes; Respiratory disorders: Asthma, Emphysema, Occupational respiratory disorders – Asbestosis, Silicosis, Siderosis, Black Lung Disease in coal miners.</p>	<p>22</p>

UNIT II : Human Anatomy and Physiology-II	PERIODS
<p>Unit II A: Body Fluids and Circulation</p> <p>Covered in I year composition of lymph and functions; Clotting of blood; Human circulatory system – structure of human heart and blood vessels; Cardiac cycle, cardiac output, double circulation; regulation of cardiac activity; Disorders of circulatory system: Hypertension, coronary artery disease, angina pectoris, heart failure.</p> <p>Unit II B: Excretory products and their elimination</p> <p>Modes of excretion – Ammonotelism, Ureotelism, Uricotelism; Human excretory system – structure of kidney and nephron; Urine formation, osmoregulation; Regulation of kidney function –Renin-Angiotensin – Aldosterone system, Atrial Natriuretic Factor, ADH and diabetes insipidus; Role of other organs in excretion; Disorders: Uraemia, renal failure, renal calculi, nephritis, dialysis using artificial kidney.</p>	<p>22</p>

UNIT III: Human Anatomy and Physiology-III	PERIODS
<p>Unit IIIA: Muscular and Skeletal system</p> <p>Skeletal muscle – ultra structure; Contractile proteins & muscle contraction; Skeletal system and its functions; Joints. (to be dealt with relevance to practical syllabus); Disorders of the muscular and skeletal system: myasthenia gravis, tetany, muscular dystrophy, arthritis, osteoporosis, gout, regormortis.</p> <p>Unit III B: Neural control and co-ordination</p> <p>Nervous system in human beings – Central nervous system, Peripheral nervous system and Visceral nervous system; Generation and conduction of nerve impulse; Reflex action; Sensory perception; Sense organs; Brief description of other receptors; Elementary structure and functioning of eye and ear.</p>	20

UNIT IV: Human Anatomy and Physiology-IV	PERIODS
<p>Unit IVA: Endocrine system and chemical co-ordination</p> <p>Endocrine glands and hormones; Human endocrine system – Hypothalamus, Pituitary, Pineal, Thyroid, Parathyroid, Adrenal, Pancreas, Gonads; Mechanism of hormone action (Elementary idea only); Role of hormones as messengers and regulators; Hypo and Hyper activity and related disorders: Common disorders –Dwarfism, acromegaly, cretinism, goiter, exophthalmic goiter, diabetes, Addison’s disease, Cushing’s syndrome.(Diseases & disorders to be dealt in brief).</p> <p>Unit IVB: Immune system</p> <p>Basic concepts of Immunology - Types of Immunity - Innate Immunity, Acquired Immunity, Active and Passive Immunity, Cell mediated Immunity and Humoral Immunity, Interferon, HIV and AIDS.</p>	15

UNIT V: Human Reproduction	PERIODS
<p>Unit VA: Human Reproductive System</p> <p>Male and female reproductive systems; Microscopic anatomy of testis & ovary; Gametogenesis “ Spermatogenesis & Oogenesis; Menstrual cycle; Fertilization, Embryo development up to blastocyst formation, Implantation; Pregnancy, placenta formation, Parturition, Lactation (elementary idea).</p> <p>Unit VB: Reproductive Health</p> <p>Need for reproductive health and prevention of sexually transmitted diseases (STD); Birth control – Need and methods, contraception and medical termination of pregnancy (MTP); Amniocentesis; infertility and assisted reproductive technologies – IVF-ET, ZIFT, GIFT (elementary idea for general awareness).</p>	22

UNIT VI: Genetics	PERIODS
<p>Heredity and variation: Mendel's laws of inheritance with reference to <i>Drosophila</i>. (<i>Drosophila melanogaster</i> Grey, Black body colour; Long, Vestigial wings), Pleiotropy; Multiple alleles: Inheritance of blood groups and Rh-factor; Co-dominance (Blood groups as example); Elementary idea of polygenic inheritance; Skin colour in humans (refer Sinnott, Dunn and Dobzhansky); Sex determination – in humans, birds, <i>Fumea</i> moth, genic balance theory of sex determination in <i>Drosophila melanogaster</i> and honey bees; Sex linked inheritance – Haemophilia, Colour blindness; Mendelian disorders in humans: Thalassemia, Haemophilia, Sickle celled anaemia, cystiefibrosis PKU, Alkaptonuria; Chromosomal disorders –Down's syndrome, Turner's syndrome and Klinefelter syndrome; Genome, Human Genome Project and DNA Finger Printing,</p>	20

UNIT VII: Organic Evolution	PERIODS
<p>Origin of Life, Biological evolution and Evidences for biological evolution (palaeontological, comparative anatomical, embryological and molecular evidences); Theories of evolution: Lamarckism (in brief), Darwin's theory of Evolution -Natural Selection with example (Kettlewell's experiments on <i>Biston bitularia</i>), Mutation Theory of Hugo De Vries; Modern synthetic theory of Evolution - Hardy-Weinberg law ; Types of Natural Selection; Gene flow and genetic drift; Variations (mutations and genetic recombination); Adaptive radiation – viz., Darwin's finches and adaptive radiation in marsupials; Human evolution; Speciation – Allopatric, sympatric; Reproductive isolation.</p>	15

UNIT VIII: Applied Biology	PERIODS
<p>Apiculture; Animal Husbandry: Pisciculture, Poultry management, Dairy management; Animal breeding; Bio-medical Technology : Diagnostic Imaging (X-ray, CTscan, MRI), ECG, EEG; Application of Biotechnology in health: Human insulin and vaccine production ; Gene Therapy; Transgenic animals; ELISA; Vaccines, MABs, Cancer biology, stem cells.</p>	15