DEPARTMENT OF PRE-UNIVERSITY EDUCATION

(PRACTICAL SUBJECTS - 70 + 30) - 2021-22

SUB: BIOLOGY **CODE: 36** **CLASS: I PUC**

TERMS	CHAPTERS TO BE COVERED	PRACTICALS TO BE PERFORMED	TOTAL HOURS
1 16-08-2021 TO 15-09-2021	**UNIT-1: DIVERSITY IN THE LIVING WORLD** **1: The Living World** Introduction 1.1 What is living? 1.2 Diversity in the living world 1.3 Taxonomic categories 1.3.1 Species 1.3.2 Genus 1.3.3 Family 1.3.4 Order 1.3.5 Class 1.3.6 Phylum 1.3.7 Kingdom 1.4 Taxonomical AIDS 1.4.1 Herbarium 1.4.2 Botanical garden 1.4.3 Museum 1.4.4 Zoological parks 1.4.5 Key **2:Biological Classification** Introduction 2.1 Kingdom monera 2.1.1 Archaebacteria 2.1.2 Eubacteia 2.2 Kingdom protista 2.2.1 Chrysophytes 2.2.2 Dinoflagellates 2.2.3 Euglenoids	**Exercise-1 :** To study parts of a compound microscope **Exercise-2 :** To identify and study the morphology of representative types of bacteria, fungi and different plant groups **Exercise-3 :** To study some selected animals on the basis of their external features **Exercise-13 :** Preparation of herbarium sheets of flowering plants	**19**

	2.2.4 Slime moulds 2.2.5 Protozoans 2.3 Kingdom fungi 2.3.1 Phycomycetes 2.3.2 Ascomycetes 2.3.3 Basidiomycetes 2.3.4 Deuteromycetes 2.4 Kingdom plantae 2.5 Kingdom animalia 2.6 Viruses, viroids, prions and lichens **3: Plant Kingdom** Introduction 3.1 Algae 3.1.1 Chlorophyceae 3.1.2 Phaeophyceae 3.1.3 Rhodophyceae 3.2 Bryophytes 3.2.1 Liverworts 3.2.2 Mosses 3.3 Pteridophytes 3.4 Gymnosperms 3.5 Angiosperms 3.6 Plant life cycles and alternation of generations **4: Animal Kingdom** Introduction 4.1 Basis of classification 4.1.1 Levels of organisation 4.1.2 Symmetry 4.1.3 Diploblastic and triploblastic organisation 4.1.4 Coelom 4.1.5 Segmentation 4.1.6 Notochord 4.2 Classification of animals 4.2.1 Phylum - Porifera 4.2.2 Phylum - Coelenterata(Cnidaria)		

	4.2.3 Phylum - Ctenophora 4.2.4 Phylum - Platyhelminthes 4.2.5 Phylum - Aschelminthes 4.2.6 Phylum - Annelida 4.2.7 Phylum - Arthropoda 4.2.8 Phylum - Mollusca 4.2.9 Phylum - Echinodermata 4.2.10 Phylum - Hemichordata 4.2.11 Phylum - Chordata 4.2.11.1 Class - Cyclostomata 4.2.11.2 Class - Chondrichthyes 4.2.11.3 Class - Osteichthyes 4.2.11.4 Class - Amphibia 4.2.11.5 Class - Reptilia 4.2.11.6 Class - Aves 4.2.11.7 Class - Mammalia		
I -TEST	**13-09-2021 TO 15-09-2021** **(Based on the chapters covered in the first term)** **The pattern and design of the TEST will be on par with the board examination standards**		
FIRST ASSIGNMENT	**The assignment would comprise questions that test the logical thinking and reasoning ability of students**		
2 16-09-2021 TO 30-11-2021	**UNIT-2: STRUCTURAL ORGANISATION IN PLANTS AND ANIMALS** **5: Morphology of Flowering Plants** Introduction 5.1 The root 5.1.1 Regions of the root 5.1.2 Modifications of root 5.2 The stem 5.2.1 Modifications of stem 5.3 The leaf	**Exercise-4 :** Study of tissues and diversity in shapes and sizes of plant cells **Exercise-6 :** Study of mitosis **Exercise-7 :** To study modifications of root **Exercise-8 :** To study modifications of stem **Exercise-9 :** To study modifications of leaf	**36**

	5.3.1 Venation 5.3.2 Types of leaves 5.3.3 Phyllotaxy 5.3.4 Modifications of leaves 5.4 The inflorescence 5.5 The flower 5.5.1 Parts of a flower 5.5.1.1 Calyx 5.5.1.2 Corolla 5.5.1.3 Androecium 5.5.1.4 Gynoecium 5.6 The fruit 5.7 The seed 5.7.1 Structure of a dicotyledonous seed 5.7.2 Structure of a monocotyledonous seed 5.8 Semi-technical description of a typical flowering plant 5.9 Descriptions of some important families 5.9.1 Fabaceae 5.9.2 Solanaceae 5.9.3 Liliaceae **UNIT-3: CELL: STRUCTURE AND FUNCTIONS** **8: Cell: The Unit of Life** **Introduction** 8.1 What is a cell? 8.2 Cell theory 8.3 An overview of cell 8.4 Prokaryotic cells 8.4.1 Cell envelope and its modifications 8.4.2 Ribosomes and inclusion bodies 8.5 Eukaryotic cells 8.5.1 Cell membrane 8.5.2 Cell wall 8.5.3 Endomembrane system 8.5.3.1 The endoplasmic reticulum (ER) 8.5.3.2 Golgi apparatus	**Exercise-10 :** To study and identify different types of inflorescences **Exercise-11 :** Study and describe flowering plants of families Solanaceae, Fabaceae and Liliaceae **Exercise-20 :** To detect the presence of carbohydrates like glucose, sucrose and starch **Exercise-21 :** To detect the presence of proteins **Exercise-22 :** To detect the presence of fats(lipid) in different plants and animal materials **Exercise-23 :** Separation of plant pigments (chloroplast pigments) by paper chromatography **Exercise-24 :** To study the rate of respiration in flower buds or germinating seeds **Exercise-25 :** Observation and comment on the setup	

	8.5.3.3 Lysosomes 8.5.3.4 Vacuoles 8.5.4 Mitochondria 8.5.5 Plastids 8.5.6 Ribosomes 8.5.7 Cytoskeleton 8.5.8 Cilia and flagella 8.5.9 Centrosome and centrioles 8.5.10 Nucleus 8.5.11 Microbodies **9: Biomolecules** Introduction 9.1 How to analyse chemical composition? 9.2 Primary and secondary metabolites 9.3 Biomacromolecules 9.4 Proteins 9.5 Polysaccharides 9.6 Nucleic acids 9.7 Structure of proteins 9.8 Nature of bond linking monomers in a polymer 9.9 Dynamic state of body constituents – concept of metabolism 9.10 Metabolic basis for living 9.11 The living state 9.12 Enzymes 9.12.1 Chemical reactions 9.12.2 How do enzymes bring about such high rates of chemical conversions? 9.12.3 Nature of enzyme action 9.12.4 Factors affecting enzyme activity 9.12.5 Classification and nomenclature of enzymes 9.12.6 Co-factors **10: Cell Cycle and Cell Division** Introduction 10.1 Cell cycle 10.1.1 Phases of cell cycle		

	10.2 M phase 10.2.1 Prophase 10.2.2 Metaphase 10.2.3 Anaphase 10.2.4 Telophase 10.2.5 Cytokinesis 10.3 Significance of mitosis 10.4 Meiosis 10.4.1 Meiosis I 10.4.2 Meiosis II 10.5 Significance of meiosis **UNIT-4: PLANT PHYSIOLOGY** **13: Photosynthesis in Higher Plants** Introduction 13.1 What do we know? 13.2 Early experiments 13.3 Where does photosynthesis take place? 13.4 How many types of pigments are involved in photosynthesis? 13.5 What is light reaction? 13.6 The electron transport 13.6.1 Splitting of water 13.6.2 Cyclic and non-cyclic photo-phosphorylation 13.6.3 Chemiosmotic hypothesis 13.7 Where are the ATP and NADPH used? 13.7.1 The primary acceptor of CO_2 13.7.2 The Calvin cycle 13.8 The C_4 pathway 13.9 Photorespiration 13.10 Factors affecting photosynthesis 13.10.1 Light 13.10.2 Carbon dioxide concentration 13.10.3 Temperature 13.10.4 Water **14: Respiration in Plants** Introduction		

	14.1 Do plants breathe? 14.2 Glycolysis 14.3 Fermentation 14.4 Aerobic respiration 14.4.1 Tricarboxylic acid cycle 14.4.2 Electron transport system (ETS) and oxidative phosphorylation 14.5 The respiratory balance sheet 14.6 Amphibolic pathway 14.7 Respiratory quotient **15: Plant Growth and Development** Introduction 15.1 Growth 15.1.1 Plant growth generally is indeterminate 15.1.2 Growth is measurable 15.1.3 Phases of growth 15.1.4 Growth rates 15.1.5 Conditions for growth 15.2 Differentiation, dedifferentiation and redifferentiation 15.3 Development		
SECOND ASSIGNMENT	**The assignment would comprise questions that test the logical thinking and reasoning ability of students**		
MID-TERM EXAMINATION	**20-11-2021 TO 30-11-2021** **(Based on the chapters covered in the first and second terms)** **The pattern and design of the Examination will be on par with the board examination standards**		
3 01-12-2021 TO 30-01-2022	**15: Plant Growth and Development Continuation** 15.4 Plant growth regulators 15.4.1 Characteristics 15.4.2 The discovery of plant growth regulators 15.4.3 Physiological effects of plant growth regulators 15.4.3.1 Auxins 15.4.3.2 Gibberellins 15.4.3.3 Cytokinins	**Exercise-29 :** To detect the presence of urea in the given sample of urine **Exercise- 30 :** To test the presence of sugar in the given sample of urine **Exercise- 31 :** To detect the presence of albumin in the given sample of urine	**35**

	15.4.3.4 Ethylene 15.4.3.5 Abscisic acid 15.5 Photoperiodism 15.6 Vernalisation 15.7 Seed dormancy **UNIT-5: HUMAN PHYSIOLOGY** **17: Breathing and Exchange of Gases** Introduction 17.1 Respiratory organs 17.1.1 Human respiratory system 17.2 Mechanism of breathing 17.2.1 Respiratory volumes and capacities 17.3 Exchange of gases 17.4 Transport of gases 17.4.1 Transport of oxygen 17.4.2 Transport of carbon dioxide 17.5 Regulation of respiration 17.6 Disorders of respiratory system **18: Body Fluids and Circulation** Introduction 18.1 Blood 18.1.1 Plasma 18.1.2 Formed elements 18.1.3 Blood groups 18.1.3.1 ABO grouping 18.1.3.2 Rh grouping 18.1.4 Coagulation of blood 18.2 Lymph (tissue fluid) 18.3 Circulatory pathways 18.3.1 Human circulatory system 18.3.2 Cardiac cycle 18.3.3 Electrocardiograph (ECG) 18.4 Double circulation 18.5 Regulation of cardiac activity 18.6 Disorders of circulatory system	**Exercise-32 :** To detect the presence of bile salts in the given sample of urine **Exercise-33 :** To study the human skeleton **Exercise-34 :** To study different types of joints in human skeleton	

	19: Excretory Products and their Elimination Introduction 19.1 Human excretory system 19.2 Urine formation 19.3 Function of the tubules 19.4 Mechanism of concentration of the filtrate 19.5 Regulation of kidney function 19.6 Micturition 19.7 Role of other organs in excretion 19.8 Disorders of the excretory system **20: Locomotion and Movement** Introduction 20.1 Types of movement 20.2 Muscle 20.2.1 Structure of contractile proteins 20.2.2 Mechanism of muscle contraction 20.3 Skeletal system 20.4 Joints 20.5 Disorders of muscular and skeletal system **21: Neural Control and Coordination** Introduction 21.1 Neural system 21.2 Human neural system 21.3 Neuron as structural and functional unit of neural system 21.3.1 Generation and conduction of nerve impulse 21.3.2 Transmission of impulses 21.4 Central neural system 21.4.1 Forebrain 21.4.2 Midbrain 21.4.3 Hindbrain 21.5 Reflex action and reflex arc 21.6 Sensory reception and processing 21.6.1 Eye 21.6.1.1 Parts of an eye 21.6.1.2 Mechanism of vision		

	21.6.2 The ear 20.6.2.1 Mechanism of hearing **22: Chemical Coordination and Integration** Introduction 22.1 Endocrine glands and hormones 22.2 Human endocrine system 22.2.1 The hypothalamus 22.2.2 The pituitary gland 22.2.3 The pineal gland 22.2.4 Thyroid gland 22.2.5 Parathyroid gland 22.2.6 Thymus 22.2.7 Adrenal gland 22.2.8 Pancreas 22.2.9 Testis 22.2.10 Ovary 22.3 Hormones of heart, kidney and gastrointestinal tract 22.4 Mechanism of hormone action		
II - TEST	**28-01-2022 TO 31-01-2022** **(Based on the chapters covered in the third term)** **The pattern and design of the TEST will be on par with the board examination standards.**		
4 01-02-2022 TO 31-03-2022	**UNIT-2: STRUCTURAL ORGANISATION IN PLANTS AND ANIMALS** **6:Anatomy of Flowering Plants** **Introduction** 6.1 The tissues 6.1.1 Meristematic tissues 6.1.2 Permanent tissues 6.1.2.1 Simple tissues 6.1.2.2 Complex tissues 6.2 The tissue system 6.2.1 Epidermal tissue system 6.2.2 The ground tissue system 6.2.3 The vascular tissue system	**Exercise-5 :** Preparation of temporary slides of animal tissues and their study **Exercise-12 :** To study anatomy of stem and root of monocots and dicots **Exercise-14 :** Study of external morphology of animals through models **Exercise-15 :** To demonstrate osmosis by potato osmometer	**30**

	6.3 Anatomy of dicotyledonous and monocotyledonous plants 6.3.1 Dicotyledonous root 6.3.2 Monocotyledonous root 6.3.3 Dicotyledonous stem 6.3.4 Monocotyledonous stem 6.3.5 Dorsiventral (Dicotyledonous) leaf 6.3.6 Isobilateral (Monocotyledonous) leaf 6.4 Secondary growth 6.4.1 Vascular cambium 6.4.1.1 Formation of cambial ring 6.4.1.2 Activity of the cambial ring 6.4.1.3 Spring wood and autumn wood 6.4.1.4 Heartwood and sapwood 6.4.2 Cork cambium 6.4.3 Secondary growth in roots **7: Structural organisation in Animals** Introduction 7.1 Animal tissues 7.1.1 Epithelial tissue 7.1.2 Connective tissue 7.1.3 Muscle tissue 7.1.4 Neural tissue 7.2 Organ and organ system 7.3 Earthworm 7.3.1 Morphology 7.3.2 Anatomy 7.4 Cockroach 7.4.1 Morphology 7.4.2 Anatomy 7.5 Frogs 7.5.1 Morphology 7.5.2 Anatomy **UNIT-4: PLANT PHYSIOLOGY** **11: Transport in Plants** Introduction	**Exercise-16 :** Study of plasmolysis in epidermal peel of leaf **Exercise-17 :** Study of imbibition in raisins or seeds **Exercise-18 :** To study the distribution of stomata on the upper and lower surfaces of leaves **Exercise-19 :** To demonstrate difference in rate of transpiration between two surfaces of leaf **Exercise-26 :** To study the enzymatic action of salivary amylase on starch **Exercise-27 :** To study the effect of temperature on the activity of salivary amylase **Exercise-28 :** To study the effect of pH on the action of salivary amylase	

	11.1 Means of transport 11.1.1 Diffusion 11.1.2 Facilitated diffusion 11.1.2.1 Passive symports and antiports 11.1.3 Active transport 11.1.4 Comparison of different transport processes 11.2 Plant-water relations 11.2.1 Water potential 11.2.2 Osmosis 11.2.3 Plasmolysis 11.2.4 Imbibition 11.3 Long distance transport of water 11.3.1 How do plants absorb water? 11.3.2 Water movement up a plant 11.3.2.1 Root pressure 11.3.2.2 Transpiration pull 11.4 Transpiration 11.4.1 Transpiration and photosynthesis – a compromise 11.5 Uptake and transport of mineral nutrients 11.5.1 Uptake of mineral ions 11.5.2 Translocation of mineral ions 11.6 Phloem transport: Flow from source to sink 11.6.1 The pressure flow or Mass flow hypothesis **12: Mineral Nutrition** Introduction 12.1 Methods to study the mineral requirements of plants 12.2 Essential mineral elements 12.2.1 Criteria for essentiality 12.2.2 Role of macro- and micro-nutrients 12.2.3 Deficiency symptoms of essential elements 12.2.4 Toxicity of micronutrients 12.3 Mechanism of absorption of elements 12.4 Translocation of solutes 12.5 Soil as reservoir of essential elements 12.6 Metabolism of nitrogen		

	12.6.1 Nitrogen cycle 12.6.2 Biological nitrogen fixation **UNIT-5: HUMAN PHYSIOLOGY** **16 : Digestions and Absorption** Introduction 16.1 Digestive system 16.1.1 Alimentary canal 16.1.2 Digestive glands 16.2 Digestion of food 16.3 Absorption of digested products 16.4 Disorders of digestive system		
FINAL EXAMINATION	**24-03-2022 TO 30-03-2022** **(Based on the complete syllabus covered during the academic year)**		
		TOTAL TEACHING HOURS	**120**