BIOLOGICAL SCIENCE (BIOS)

CLASS – XI

Full Marks - 100

THEORY - 70 Marks

Unit-1	**DIVERSITY OF LIVING ORGANISMS**	**07 marks**
Unit-2	**STRUCTURAL ORGANIZATION OF PLANTS**	**12 marks**
Unit-3	**CELL: STRUCTURE & FUNCTION**	**15 marks**
Unit-4	**PLANT PHYSIOLOGY**	**18 marks**
Unit-5	**HUMAN PHYSIOLOGY**	**18 marks**

UNIT – I DIVERSITY OF LIVING ORGANISMS

1. Science of life

1.1 Science of Life – Introduction
1.2 Characteristics of life
1.3 Definition and concept of biodiversity

2. Taxonomy and Systematic

2.1 Taxonomy and Systematics – Definition
2.2 Taxonomic hierarchy-(Linnaeus) with Example 1
2.3 Bionomical nomenclature

3. Classification of Living Organisms

3.1 What is classification (Definition)
3.2 Need for classification
3.3 Five kingdoms of life and the basis of classification of five kingdoms.
3.4 Salient features and classification of Monera, Protoctista (Protista), Fungi and Lichens into major groups.
3.5 Virus and viriods – a brief General account.
3.6 Salient features and classification of plant into major group – Algae, Bryophytes Pteridophytes, Gymnosperms and Angiosperms (three to five salient and distinguishing features of each category and at least two examples of each category
3.7 Angiosperm – classification upto class, characteristic features (three to five) and examples.
3.8 Salient features and classification of Animals – major non chordata upto phyla And chordatas upto class level (three to five Salient features and at least two examples)
3.9 Tools for study of biodiversity – Museums, Zoos, Botanical Garden & Herberia.

Unit – II STRUCTURAL ORGANISATION IN PLANTS AND ANIMALS

4. Structural Organisation in Plants

4.1 Tissues (Definition)
4.2 Tissues in plants – Meristematic and Permanent (Structure and function)
4.3 Morphology of Root, Stem and leaf (including modifications, microscopic

Anatomy and functions)(To be dealt along with relevant practicals)

4.4 Inflorescenes (Major types – Racemose And Cymose)

4.5 Morphology of flower (including aestivation And placentation), fruit and seed (one Monocot-Maize and one Dicot-Gram)

5. Structural Organisation in Animals

5.1 Tissues in animals (structure, occurrence and function in brief).

5.2 Morphology, anatomy and functions of different systems (digestive, circulatory respiratory, nervous and reproductive) of an insect-cockroach.(brief account)

Unit-III CELL STRUCTURE AND FUNCTION

6. Cell

6.1 Cell theory and cell as the basic unit of life

6.2 Cell and its major parts - cell membranes and protoplasm (cytoplasm and nucleus)

6.3 Structure of a prokaryotic and eukaryotic cell (in brief).

6.4 Structure of plant cell and animal cell (in brief).

6.5 Cell envelop - cell membrane and cell wall (ultrastructure and function)

6.6 Cell organelles-Ultrastructure and function; Mitochondria, golgi bodies, endoplasmic reticulum, ribosomes, lysomes,vacuoles, plastids, micro bodies (peroxisomes, spherosomes and glyoxysomes).

6.7 Ultra structure and function of cytoskeleton, Cilia, flagella and centrioles.

6.8 Nucleus- nuclear membrane,nucleoplasm, Chromatin,nucleolus(ultrastructure and function)

7. Chemical constituents of living cell

7.1 Chemical constituents of living cell
7.2 Biomolecules-structure and function of protein, carbohydrate, lipid and nucleic acid.
7.3 Enzyme-types,properties and enzyme action (lock and key, induced fit model and allosterism)

8. Cell Division

8.1 Introduction
8.2 Definition and types
8.3 Cell cycle
8.4 Mitosis- Definition and significance (process not required)
8.5 Meiosis- Definition,types,process and Significance
8.6 Difference between mitosis and meiosis

Unit- IV PLANT PHYSIOLOGY

9. Movement of Water, Food, Nutrition And Gases

9.1 Introduction
Absorption of water,gases and nutrients.
9.2 Cell to cell transport- diffusion,facilitated diffusion,active transport
9.3 Plant-water relation- imbibitions,water potential,osmosis and plasmolysis.
9.4 Long distance transport-apoplast,symplast, root pressure transpiration pull, Uptake of mineral ions

9.5 Transpiration and guttation, opening and closing of stomata
9.6 Translocation- transport through xylem and phloem,
Mass flow hypothesis

10. Plant Nutrition And Minerals

10.1 Introduction
10.2 Essential minerals-macro and micro nutrients, their roles and deficiency symptoms (in tabular form)
10.3 Mineral toxicity
10.4 Elementary idea of the Hydroponics
10.5 Nitrogen metabolism-nitrogen cycle, biological nitrogen fixation.

11. Respiration

11.1 Introduction
11.2 Exchange of gases
11.3 Cellulare respiration-glycolysis, fermentation (anaerobic), T.C.A cycle and E.T.S (aerobic) Definition, process and significance
11.4 Energy relations-number of A.T.P molecules generated in respiration.
11.5 Amphibolic pathways
11.6 Respiratory quotient of nutrients

12. Photosynthesis

12.1 Introduction-Autotrophic nutrition: photo and chemo-autotrophic, nutritions.
12.2 Definition and the site of Photosynthesis.
12.3 Photosynthetic pigments
(elementary idea-structure not required)

12.4 Photochemical and biosynthetic phases of photosynthesis.
12.5 Cyclic and non cyclic photophosphorylation.
12.6 Chemo osmotic hypothesis
12.7 Photo respiration
12.8 C_3 and C_4 pathways
12.9 Factors Controlling photosynthesis

13. Plant Growth And Development

13.1 Introduction
13.2 Phases of plant growth and plant growth rate
13.3 Condition of growth.....(light, temperature, water,hormone,nutrients only)
13.4 Differentiation, De-differentiation, and Re-differentiation-definition and example only.
13.5 Sequence of developmental process in a plant cell through chart.
13.6 Growth regulations-auxin, gibberellins cytokinin, ethylene, A.B.A
13.7 Seed germination
13.8 Seed dormancy
13.9 Vernalisation
13.10 Photoperiodism-definition, types of plants on the basis of the length of the photoperiod.

Unit- V HUMAN PHYSIOLOGY

14. Digestion and Absorption

14.1 Introduction
14.2 Structure (in brief) of human Alimentary canal including dental arrangement and digestive glands.

14.3 Role of the digestive enzymes and the G -1 Hormone in digestion.
14.4 Peristalsis
14.5 Digestion, absorption and assimilation of protein, carbohydrate and fat
14.6 [Caloric value of proteins, carbohydrates and fats.] Box item-not to be evaluated.
14.7 Egestion
14.8 Nutritional and digestive disorders- PEM (protein energy malnutrition,) indigestion, constipation vomiting, jaundice, diarrhoea.

15. Breathing and Respiration

15.1 Introduction
15.2 Respiratory organs in animals (through chart, recall only)
15.3 Respiratory system in human (outline)
15.4 Mechanism of breathing and its regulation in human.
15.5 Exchange of gases, transport of gases and regulation of respiration.
15.6 Repertory volumes
15.7 Disorders related to respiration Asthma, emphysema, occupational respiratory disorders- (e.g. Silicosis, Asbestosis)

16. Body Fluids And Circulation

16.1 Introduction
16.2 Composition of Blood (Tabular form)
16.3 Blood groups, ABO Blood groups
16.4 Coagulation of blood
16.5 Composition of lymph and its function
16.6 Human circulatory system-(outline idea)
16.7 Structure of Human heart and blood vessels.

16.8 Cardiac cycle
16.9 Cardiac output (stroke volume and minute volume, determination of cardiac output- Fick's Principle)
16.10 E.C.G (brief idea, no analysis required)
16.11 Double circulation
16.12 Regulation of cardiac activity (neutral and hormonal) including factors regulating Blood Pressure
16.13 Disorders of the circulatory system hypertension, corornary artery disese, angina pectoris, heart failure.

17. Excretory Products And their Elimination

17.1 Introduction
17.2 Modes of excretion- Ammonotelism Ureotelism, Uricotelism (Definition and Examples)
17.3 Human excretory system- structure and function (Histology of nephron)
17.4 Urine formation and Osmo- regulation
17.5 Regulation of Kidney function, Renin, angiotensin, Antidiuretic factor A.D.H and diabetes insipidus
17.6 Role of other organs in excretion- Liver, skin , lung and salivary gland.
17.7 Disorders- Uraemia, renal failure, Renal calculi, Nephritis.
17.8 Dialysis and artificial kidney

18. Locomotion and Movement

18.1 Introduction- What is locomotion and movement?
18.2 Types of movement ciliary Flagellar and muscular.

18.3 Skeletal muscle-contractile proteins and muscle contraction.
18.4 Skeletal system and its function. (To be dealt with relevant portion of practical syllabus)
18.5 Joints
18.6 Disorders of muscular and skeletal system- Myasthenia gravis, tetany, Muscular dystrophy, arthritis osteoporosis and gout.

19. Neural control and coordination

19.1 Introduction- what is neural control and co-ordination
19.2 Neurones and nerves (Revisionary)
19.3 Nervous system in human
19.4 Central Nervous System, Peripheral Nervous System (P.N.S), and visceral Nervous System. Brain and its major parts- cerebral cortex, thalamus, hypothalamus and lymbic system, mid brain, pons, medulla, cerebellum and Spinal cord (function only), Mode of distribution and function of P.N.S and autonomic nervous system.
19.5 Generation and Conduction of nerve impulse.
19.6 Reflex action and Reflex Arc
19.7 Sense Organs- sensory perception outline structure and function of eye and ear.

20. Chemical Coordination And Regulation

20.1 Introduction- endocrine glands and hormones.
20.2 Human endocrine system- Hypothalamus, Pituitary, Pineal,

Thyroid, Parathyroid, Adrenal, Pancreas,Gonads (location and function only)

20.3 Mechanism of hormone action (elementary idea)

20.4 Role of hormones as messengers and regulators.

20.5 Hypo and Hyper activity of endocrine glands and related Disorders (common disorders e.g., Dwarfism Acromegaly Cretinism,Goiter, Exopthalmic goiter, Diabetes, Addisons disease.
(Important diseases related to physiology of all Systems of human are to be taught briefly.)