BOARD OF SCHOOL EDUCATION HARYANA

Syllabus and Chapter wise division of Marks (2023-24)

Class-XI **Subject- Biology** **Code: 865**

General Instructions:

1. There will be an Annual Examination based on the entire syllabus.
2. The annual examination (Theory) will be of 70 Marks whereas Practical examinations will be of 30 marks (internal). Therefore, Total annual evaluation (70+30) will be of 100 marks.

PRACTICALS

Evaluation Scheme	**Marks**
Marks allocated for SAT Weightage 1. Student Assessment Test Weightage of marks (06 marks of SAT, 02 marks of half yearly test, 02 marks for attendance and classroom participation) 2. Practical file/ Record 3. Project Record	**15** 10 03 02
Marks allocated for Annual Practical Examination	**15**
Experiments (two)	09 (4.5 marks for each experiment)
Activity (One from Syllabus)	03
Viva Voce (Based on Experiments and Activity)	03
Total marks	**30**

Course Structure (2023-24)

Class-XI **Subject- Biology** **Code: 865**

Sr. No.	Unit	Chapter	Marks
I	Diversity of Living Organisms	The Living World	15
		Biological Classification	
		Plant Kingdom	
		Animal Kingdom	
II	Structural Organization in Plants and Animals	Morphology of Flowering Plants	10
		Anatomy of Flowering Plants	
		Structural Organisation in Animals	
III	Cell: Structure and Function	Cell: The Unit of Life	15
		Biomolecules	
		Cell Cycle and Cell Division	
IV	Plant Physiology	Photosynthesis in Higher Plants	12
		Respiration in Plants	
		Plant Growth and Development	
V	Human Physiology	Breathing and Exchange of Gases	18
		Body Fluids and Circulation	
		Excretory Products and their Elimination	
		Locomotion and Movement	
		Neural Control and Coordination	
		Chemical Coordination and Integration	
Total			70
Practical			30
Grand Total			**100**

Unit I: Diversity in the living World

Chapter 1: The Living World

Diversity in the living world, **Taxonomic Categories**- Species, Genus, Family, Order, Class, Phylum, Kingdom.

Chapter 2: Biological Classification

Kingdom Monera: Archaebacteria, Eubacteria, **Kingdom Protista:** Chrysophytes, Dinoflagellates, Euglenoids, Slime-Moulds, Protozoans, **Kingdom Fungi**: Phycomycetes, Ascomycetes, Basidiomycetes, Deuteromycetes, **Kingdom Plantae**, **Kingdom Animalia**, **Viruses, Viroid, Prions, Lichens**.

Chapter 3: Plant Kingdom

Algae: Chlorophyceae, Phaeophyceae, Rhodophyceae; **Bryophytes**: liverworts, mosses, **Pteridophytes, Gymnosperms**, **Angiosperms**.

Chapter 4: Animal Kingdom

Basis of classification-levels of organization, symmetry, diploblastic and triploblastic organization,coelom, segmentation, notochord, **Classification of animals:** Phylum-Porifera, Coelenterates (cnidaria), Ctenophora, Platyhelminthes, Aschelminths, Annelida, Arthropoda, Mollusca, Echinodermata, Hemi-Chordata, Phylum Chordata- Subphyla: Urochordata, Cephalo-Chordata, Vertebrata-class-Cyclostomata, Chondrichthyes, Osteichthyes, Amphibia, Reptilia, Aves, Mammalia.

Unit II Structural Organisation in Plants and Animals

Chapter 5: Morphology of Flowering Plants

The root- regions of root; The Stem, **The leaf**- venation, types of leaves phyllotaxy; **The Inflorescence**; **The flower**, Parts of flower: calyx, corolla, androecium, gynoecium, **The Fruit**; **The seed**- structure of a dicotyledonous seed, structure of monocotyledonous seed. **Semi-technical description of a**

typical flowering plant, **Description of some Important families**- Solanaceae.

Chapter 6: Anatomy of flowering plants:

The tissue system- Epidermal tissue system, the ground tissue system, The vascular tissue system; **Anatomy of dicotyledonous and monocotyledonous plants** – Dicotyledonous root, Monocotyledonous root, Dicotyledonous stem, Monocotyledonous stem and Dorsiventral (Dicotyledonous) leaf, Isobilateral (Monocotyledonous) leaf.

Chapter 7: Structural Organisation in Animals:

Organ and organ systems, **Frogs-** morphology, anatomy.

Unit III: Cell: Structure and Functions

Chapter 8: Cell the Unit of Life

What is a cell? **cell theory**, **an overview of cell**, **prokaryotic cells**, cell envelope and its modifications, ribosome and inclusion bodies; **Eukaryotic cells**, cell membrane, cell wall, endomembrane system: endoplasmic reticulum (ER), Golgi apparatus, lysosomes, Vacuoles; Mitochondria, Plastids, Ribosomes, cytoskeleton, cilia and flagella, centrosome and centrioles, Nucleus, microbodies.

Chapter 9: Biomolecules

How to analyze chemical composition? **Primary and secondary metabolites**, **biomacromolecules**, **proteins**, **polysaccharides**, **nucleic acid**, **Structure of Proteins**, **Enzymes**- chemical reactions, how do enzymes bring about such high rate of chemical conversions? Nature of enzyme action, factors affecting enzymes activity- temperature and pH, concentration of substrate, Classification and nomenclature of Enzymes, co-factors.

Chapter 10: Cell Cycle and Cell division

Cell cycle, phases of cell cycle, **M phase**-Prophase, metaphase, anaphase, telophase, cytokinesis, **Significance of mitosis**; **Meiosis**- meiosis I, meiosis II, **Significance of meiosis**.

Unit IV: Plant Physiology

Chapter 11: Photosynthesis in Higher Plants:

What do we know? **Early experiments**, **Where does photosynthesis take place**? **How many types of pigments are involved in photosynthesis**? **What is light reaction**? **The electron transport**- splitting of water, cyclic and noncyclic photophosphorylation, chemiosmotic hypothesis, **Where are the ATP and NADPH used**?- the primary acceptor of CO2, The Calvin cycle, **The C4 pathway**, **Photorespiration**, **Factors affecting Photosynthesis**- Light, carbon dioxide concentration. temperature, water.

Chapter 12: Respiration in Plants:

Do plants breath? **Glycolysis**, **Fermentation**, **Aerobic Respiration**, Tricarboxylic acid cycle, electron transport system and oxidative phosphorylation, **The respiratory balance sheet**, **Amphibolic pathway**, **Respiratory quotient**.

Chapter 13: Plant Growth and Development:

Growth- Plant growth generally is indeterminate, growth is measurable, phases of growth, growth rates, conditions for growth, **Differentiation, dedifferentiation and redifferentiation**. **Development**, **Plant growth regulators**- Characteristics, discovery of plant growth regulators, physiological effects of plant growth regulators- auxins, gibberellins, cytokinin, ethylene, abscisic acid.

Unit V: Human Physiology

Chapter 14: Breathing and Exchange of Gases

Respiratory organs- Human respiratory system, **Mechanism of Breathing**- Respiratory volumes and capacities- tidal volume, IRV, ERV, RV, IC, EC, FRC, VC, TLC, **Exchange of Gases**, **Transport of gases**- transport of oxygen, transport of carbon-dioxide, **Regulation of respiration, Disorders of Respiratory system**.

Chapter 15: Body fluids and Circulation

Blood- Plasma, Formed elements, Blood groups- ABO grouping, Rh grouping; Coagulation of blood, **Lymph (Tissue fluid), Circulatory pathways**- Human circulatory system, Cardiac cycle, Electrocardiograph (ECG), **Double circulation**, **Regulation of cardiac activity, Disorders of circulatory system**.

Chapter 16: Excretory Products and their Elimination

Human Excretory system, Urine formation, Function of tubules, Mechanism of concentration of the filtrate, Regulation of Kidney function, Micturition, Role of other organs in excretion. Disorders of excretory system.

Chapter 17: Locomotion and Movement

Types of movement, **Muscle**, structure of contractile proteins, mechanism of muscle contraction; **Skeletal system**, **Joints**, **Disorders of muscular and skeletal system**.

Chapter 18: Neural control and coordination

Neural system, **Human Neural system**, **Neuron as structural and functional unit of neural system**, generation and conduction of nerve impulse, transmission of impulses, **Central Neural System**-Forebrain, midbrain, hindbrain.

Chapter 19: Chemical coordination and Integration:

Endocrine glands and hormones, Human endocrine system, the hypothalamus, the pituitary gland, the Pineal gland, thyroid gland, parathyroid gland, thymus, adrenal gland, Pancreas, Testis Ovary, **Hormones of heart, kidney and gastrointestinal tract, Mechanism of hormone action**.

Biology Practical Session (2023-24)

A: List of Experiments:

1. Study and describe locally available common flowering plants, from family Solanaceae (Poaceae, Asteraceae or Brassicaceae can be substituted in case of particular geographical location) including dissection and display of floral whorls, anther and ovary to show number of chambers (floral formulae and floral diagrams), type of root (tap and adventitious); type of stem (herbaceous and woody); leaf (arrangement, shape, venation, simple and compound).

2. Preparation and study of T.S. of dicot and monocot roots and stems (primary).

3. Study of osmosis by potato osmometer.

4. Study of plasmolysis in epidermal peels (e.g. Rhoeo/lily leaves or flashy scale leaves of onion bulb).

5. Study of distribution of stomata on the upper and lower surfaces of leaves.

6. Comparative study of the rates of transpiration in the upper and lower surfaces of leaves.

7. Test for the presence of sugar, starch, proteins and fats in suitable plant and animal materials.

8. Separation of plant pigments through paper chromatography.

9. Study of the rate of respiration in flower buds/leaf tissue and germinating seeds.

10. Test for presence of urea in urine.

11. Test for presence of sugar in urine.

12. Test for presence of albumin in urine.

13. Test for presence of bile salts in urine.

B. Study and Observe the following (spotting):

1. Parts of a compound microscope.

2. Specimens/slides/models and identification with reasons - Bacteria, Oscillatoria, Spirogyra, Rhizopus, mushroom, yeast, liverwort, moss, fern, pine, one monocotyledonous plant, one dicotyledonous plant and one lichen.

3. Virtual specimens/slides/models and identifying features of - Amoeba, Hydra, liver-fluke, Ascaris, leech, earthworm, prawn, silkworm, honey bee, snail, starfish, shark, rohu, frog, lizard, pigeon and rabbit.

4. Mitosis in onion root tip cells and animal cells (grasshopper) from permanent slides.

5. Different types of inflorescence (cymose and racemose).

6. Human skeleton and different types of joints with the help of virtual images/models only.

Month wise Syllabus Teaching Plan (2023-24)

Class-XI **Subject- Biology** **Code: 865**

Month	Chapter No.	Teaching Periods	Revision Periods	Practical Periods
April	Chapter-1: The Living World	03	01	02
	Chapter-2: Biological classification	07	02	06
May	Chapter-3: Plant kingdom	07	04	06
	Chapter-4: Animal Kingdom	10	02	08
June	**Summer Vacation:** Project work, Biology terminology exercise and diagram note book will be prepared by learners.			
July	Chapter-5: Morphology of Flowering Plants	07	02	10
	Chapter-6: Anatomy of Flowering Plants	07		
August	Chapter-7: Structural Organisation in animals	03	04	06
	Chapter-8: Cell: The Unit of Life	12		
	Chapter 9: Biomolecules	13		
September	Chapter-10: Cell Cycle and Cell Division	06	03	06
	Chapter-11: Photosynthesis in Higher Plants	08		
	Chapter-12: Respiration in Plants	08		
	Half Yearly Examination			

October	Chapter-13: Plant Growth and Development Chapter-14: Breathing and exchange of Gases	05 06		04
November	Chapter-15: Body Fluids and Circulation Chapter-16: Excretory Products and their Elimination	09 07	02	06 02
December	Chapter-17: Locomotion and Movement Chapter-18: Neural Control and Coordination	08 06	02	08
January	Chapter-19: Chemical Coordination and Integration	08		
February	Revision Classes			
March	Annual Examination			

Month wise Practical Syllabus

Note: In following month wise scheme letter A and B represent Part A (Major and minor experiments) and Part B (Spotting) respectively.

April:

Study and observe the following (spotting):

B1. Parts of a compound microscope. Temporary slide mount preparation to study structural organisation of any fungus like bread mould.

B2. Specimens/slides/models and identification with reasons - Bacteria, Oscillatoria, Spirogyra, Rhizopus, mushroom, yeast, liverwort, moss, fern, pine, one monocotyledonous plant, one dicotyledonous plant and one lichen.

May:

Study and observe the following:

B3: Virtual specimens/slides/models and identifying features of - Amoeba, Hydra, liver-fluke, Ascaris, leech, earthworm, prawn, silkworm, honey bee, snail, starfish, shark, rohu, frog, lizard, pigeon and rabbit.

B4: Mitosis in onion root tip cells and animal cells (grasshopper) from permanent slides.

July:

A2: Preparation and study of T.S. of dicot and monocot roots and stems (primary).

A3: Study of osmosis by potato osmometer.

A4: Study of plasmolysis in epidermal peels (e.g. Rhoeo/lily leaves or flashy scale leaves of onion bulb).

B5: Study and observe the different types of inflorescence (cymose and racemose).

A1: Study and describe locally available common flowering plants, from family Solanaceae (Poaceae, Asteraceae or Brassicaceae can be substituted in case of particular geographical location) including dissection and display of floral whorls, anther and ovary to show number of chambers (floral formulae and floral diagrams), type of root (tap and adventitious); type of stem (herbaceous and woody); leaf (arrangement, shape, venation, simple and compound)

August:

Virtual experiential learning of cell, cell organelle and associated concepts

A7: Test for the presence of sugar, starch, proteins and fats in suitable plant and animal materials.

September:

A5: Study of distribution of stomata on the upper and lower surfaces of leaves.

A6: Comparative study of the rates of transpiration in the upper and lower surfaces of leaves.

A8: Separation of plant pigments through paper chromatography.

A9: Study of the rate of respiration in flower buds/leaf tissue and germinating seeds.

October:

Investigatory project

November:

A10: Test for presence of urea in urine.

A11: Test for presence of sugar in urine

A12: Test for presence of albumin in urine.

A13: Test for presence of bile salts in urine.

B6: Human skeleton and different types of joints with the help of virtual images/models only.

December:

Case Study

Note:

- **Subject teachers are advised to direct the students to prepare notebook of the Terminology/Definitional Words used in the chapters for enhancement of vocabulary or clarity of the concept.**
- **The NCERT textbooks present information in boxes across the book. These help students to get conceptual clarity. However, the information in these boxes would not be assessed in the year-end examination.**

Prescribed Books:

1. Biology Class-XI, Published by BSEH © NCERT

QUESTION PAPER DESIGN (2023-24)

Class: 11 Subject: Biology Subject Code: 865

Type of Question	**Marks**	**Number of Ques.**	**Description**	**Total Marks**
Objective Questions	1 mark each	18	14 Multiple Choice Questions, 4 Assertion-Reason Questions	18
Very Short Answer Type Question	2 marks each	7	Internal choice will be given in any 2 questions	14
Short Answer Type Question	3 marks each	5	Internal choice will be given in any 2 questions	15
Case Study	4 marks each	2	Internal choice will be given only in one part of both questions	8
Long Answer Type Question	5 marks each	3	Internal choice will be given in all the questions	15
Total	**35**		**70**	

हरियाणा विद्यालय शिक्षा बोर्ड
तमसो मा ज्योतिर्गमय