LEARNING OUTCOMES

Chapter – 1 Biological Classification

The learner

1.1 Identifies contributions of Linnaeus, Whittaker and criteria of five kingdom classification.

1.2 Compares two kingdom, five kingdom and Six Kingdom classification.

1.3 Evaluates the merits and demerits of given classification.

1.4 Describes important characters of Kingdom Monera and its groups.

1.5 Describes important characters of Kingdom Protista and its groups.

1.6 Describes important characters, reproduction of Kingdom Fungi and its classification.

1.7 Lists the examples of organisms come under each group and their importance.

1.8 Describes the organisms which are excluded from the five kingdom classification.

Chapter – 2 Plant Kingdom

The learner

2.1 Identifies the contributions of scientists in classification and defines different systems of classification with examples.

2.2 Defines important branches of systematics.

2.3 Describes and illustrates the vegetative structure, classification, pigmentation, reproduction and economic importance of algae.

2.4 Illustrates the vegetative structure and identifies the classification, reproduction and economic importance of Bryophytes.

2.5 Illustrates the vegetative structure and explains the classification, reproduction and seed habit of pteridophytes.

2.6 Illustrates the vegetative structure and explains classification, reproduction of Gymnosperms.

2.7 Identifies the classes of angiosperms and explains the methods of reproduction.

2.8 Compares the life cycle patterns of different groups of plants and lists the plants which shows exceptions in each cycle.

Chapter – 3 Morphology of Flowering Plants

The learner

3.1 Identifies the different parts of a plant and distinguishes different types of root.

3.2 Identifies the various regions of root and explains different types of root modifications.

3.3 Identifies and differentiates stem modifications and their functions.

3.4 Recognises different parts of leaf and compares the venation in leaves.

3.5 Classifies simple and compound leaves and explains phyllotaxy.

3.6 Identifies different types of leaf modifications and states their functions.

3.7 Identifies and explains different types of inflorescence

3.8 Identifies different parts of a flower and compares different types of flowers.

3.9 Recognises the position of ovary and explains three types of flowers

3.10 Distinguishes four kinds of aestivation identifies and classifies different types of and roecium.

3.11 Identifies the parts of carpel and evaluates different types of placentation.

3.12 Identifies and lists the various parts of fruits and seeds.

3.13 Dissects flowers belong to the given families and constructs floral formula and floral diagram.

Chapter- 4 Anatomy of flowering plants

The learner

4.1 Recognises the definition of tissue and explains the different types of meristematic tissue.

4.2 Recognises the different types of simple tissues and their functions.

4.3 Identifies and explains the structure and functions of complex permanent tissues

4.4 Recognises the three types of tissue system

4.5 Prepares slide, observes, sketches and explains the anatomy of dicot and monocot stem

4.6 Prepares slides, observes, sketches and explains the anatomy of dicot and monocot root

4.7 Differentiates the structure of dorsiventral and isobilateral leaf.

4.8 Explains the process of secondary thickening in dicot stem.

4.9 Recognises the types of wood and identifies their importance.

4.10 Recognises the structure and activity of cork cambium.

4.11 Explains the process of secondary thickening in dicot root.

Chapter – 5 Cell : The Unit of Life

The learner

5.1 Recognises various scientists regarding the discovery of cell and cell theory.

5.2 Recognises different types of cells and their functions.

5.3 Identifies the structure of prokaryotic cell.

5.4 Identifies the structure of eukaryotic cell.

5.5 Compares the structure of prokaryotic and eukaryotic cell.

5.6 Describes the structure of cell wall and cell membrane and recognises its chemical composition.

5.7 Describes various organelles in the endomembrane system and identifies their functions.

5.8 Describes various cell organelles and identifies their functions.

5.9 Identifies the structure of cilia and flagella.

5.10 Describes the structure and functions of nucleus.

5.1 Distinguishes the structure and functions of chromosomes and constructs models of different types of chromosomes.

Chapter – 6 Cell Cycle and Cell Division

The learner

6.1 Identifies the need and significance of cell division and defines cell cycle.

6.2 Identifies the dfferent phases in the cell cycle.

6.3 Distinguishes the different stages of mitosis and illustrates the different stages.

6.4 Identifies the peculiarities of Prophase I.

6.5 Distinguishes the features in metaphase I, anaphase I, telophase I of meiosis I.

6.6 Distinguishes the features of prophase II, metaphase II, anaphase II and telophase II of meiosis II

6.7 Compares mitosis and meiosis.

6.8 Identifies the significance of mitosis and meiosis

Chapter 7 Transport in Plants

The learner

7.1 Defines translocation.

7.2 Defines diffusion and identifies factors that influence diffusion.

7.3 Compares diffusion and facilitated diffusion.

7.4 Differentiates active and passive transports.

7.5 States water potential and identifies the factors influencing water potential.

7.6 Explains the process of osmosis.

7.7 Identifies hypertonic, hypotonic and isotonic solutions and explains plasmolysis.

7.8 Demonstrates imbibition

7.9 Identifies apoplast and symplast pathways and explains the role of mycorrhiza.

7.10 Explains root pressure and cohesion - tension - transpiration pull model and explains transpiration.

7.11 Distinguishes passive and active absorption and explains translocation of mineral ions.

7.12 Explains the mass flow of substances through phloem

Chapter - 8 Mineral Nutrition

The learner

8.1 Identifies the relevance of hydroponics in mineral nutrition.

8.2 Identifies the essentiality criteria of mineral elements.

8.3 Distinguishes between micronutrients and macronutrients and identifies their role, deficiency symptoms and toxicity.

8.4 Recognises active and passive absorption of mineral ions through symplast and apoplast

8.5 Recognizes the importance of soil.

8.6 Illustrates nitrogen cycle

8.7 Identifies the role of various microorganisms in biological nitrogen fixation.

8.8 Recognises the formation of root nodules by the action of *Rhizobium.*

8.9 Explains the mechanism of action of nitrogenase enzyme and the role of leghaemoglobin.

8.10 Recognises the utilization of nitrogen by plants.

Chapter -9 Photosynthesis in Higher Plants

The learner

9.1 States the contributions of various scientists in photosynthesis and defines photosynthesis.

9.2 Identifies the various kinds of pigments involved in light reaction.

9.3 Analyses and interprets graphs showing action spectrum and absorption spectrum.

9.4 Describes the different processes involved in light reaction.

9.5 Identifies the significance of proton gradient and explains chemiosmosis.

9.6 Explains the different stages of dark reaction and compares it with light reaction.

9.7 Identifies alternate pathways of CO_2 fixation and discriminates C_3 and C_4 Pathways .

9.8 Identifies the process of photorespiration and states its demerits.

9.9 Evaluates the factors that influence the rate of photosynthesis.

Chapter – 10 Respiration in Plants

The learner

10.1 Identifies and explains the cellular respiration and its importance in organisms.

10.2 Differentiates the gaseous exchange in plants and animals.

10.3 Identifies the types of respiraton.

10.4 Explains the process of glycolysis.

10.5 Explains the metabolic fate of pyruvate.

10.6 Explains different types of anaerobic respiration.

10.7 Recognises the process of decarboxylation of pyruvic acid.

10.8 Explains TCA cycle and illustrates its pathway.

10.9 Explains ETS and sketches the pathway.

10.10 Evaluates the respiratory balance sheet of aerobic and anaerobic respiration.

10.11 Identifies respiration as an amphibolic pathway.

10.12 Illustrates the interrelationship among metabolic pathways showing the breakdown of different respiratory substrates.

10.13 Defines RQ and identifies respiratory substrates by calculating RQ.

Chapter - 11 Plant Growth and Development

The learner

11.1 Defines growth and recognises types of growth and phases of growth.

11.2 Distinguishes arithmetic growth and geometrical growth, absolute growth and relative growth.

11.3 Recognises necessary conditions for growth and differentiates differentiation, dedifferentiation and redifferentiation.

11.4 Explains development and plasticity.

11.5 Evaluates the contribution of scientists in the invention of plant growth regulators.

11.6 Identifies the nature, functions and applications of plant growth regulators.

11.7 Explains photoperiodism.

11.8 Classifies plants based on their photoperiodic responses and explains vernalisation and seed dormancy.