7.3 Mechanism of Enzyme Action
7.4 Factors that Affect the Activity of Enzymes
7.5 Enzyme Inhibition

Chapter 8 : Bioenergetics

8.1 ATP : The Cell's Energy Currency
8.2 Photosynthesis
8.3 Cellular Respiration

Chapter 9 : Plant Physiology

9.1 Nutrition in Plants
9.2 Transport in Plants
9.3 Transpiration
9.4 Transport of Water and Salts in Plants
9.5 Translocation of Food in Plants
9.6 Gaseous Exchange in Plants
9.7 Mechanisms for Exretion in Plants
9.8 Osmotic Adjustments in Plants

Chapter 10 : Reproduction in Plants

10.1 Types of Asexual Reproduction
10.2 Artificial Propagation
10.3 Sexual Reproduction in Plants

Chapter 11 : Biostatistics

11.1 Introduction of Biostatics
11.2 Mean, Median and Mode
11.3 Bar Chart

Prescribed Book: **Biology for Part – I (Class –IX) (9th)**
Authors: Dr. Raheela Nadeem, Dr. Robeela Shabbir, Dr. Adnan Ahmad Rana, Mr. Zunnorain Ahmed, Muhammad Naveed Asghar
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Part-II (Class-X)	**Marks: 60**	**Time: 2:00 Hours**

SECTION: 3
LIFE PROCESSES

Unit-10 : GASEOUS EXCHANGE

10.1 Gaseous Exchange in Plants
10.2 Gaseous Exchange in Humans
10.2.1 The Air Passageway 10.2.2 The Lungs
10.2.3 The Mechanism of Breathing
10.3 Respiratory Disorders (Bronchitis, Emphysema, Pneumonia, Asthma, Lung Cancer, Bad Effects of Smoking)

Unit-11 : HOMEOSTASIS

11.1 Homeostasis in Plants
11.1.1 Removal of Extra Carbon Dioxide and Oxygen
11.1.2 Removal of Extra Water
11.1.3 Removal of other Metabolic Wastes
11.1.4 Osmotic Adjustments in Plants

11.2 Homeostasis in Humans
- 11.2.1 Skin
- 11.2.2 Lungs

11.3 Urinary System of Humans
- 11.3.1 Structure of Kidney
- 11.3.2 Functioning of Kidney
- 11.3.3 Osmoregulatory Function of Kidney

11.4 Disorders of Kidney
- 11.4.1 Kidney Stones
- 11.4.2 Kidney Failure

Unit-12 : COORDINATION AND CONTROL

12.1 Types of Coordination (Coordinated Action)

12.2 Human Nervous System
- 12.2.1 Nerve Cell or Neuron
- 12.2.2 Divisions of the Nervous System
- 12.2.3 Reflex Action

12.3 Receptors in Humans
- 12.3.1 Eye
- 12.3.2 Ear

12.4 Endocrine System
- 12.4.1 Important Endocrine Glands
- 12.4.2 Feedback Mechanisms

12.5 Disorders of Nervous System
- 12.5.1 Paralysis
- 12.5.2 Epilepsy

Unit-13 : SUPPORT AND MOVEMENT

13.1 Human Skeleton
- 13.1.1 Role of Skeletal System
- 13.1.2 Bone and Cartilage
- 13.1.3 Components of Human Skeleton

13.2 Types of Joints
- 13.2.1 Roles of Tendons and Ligaments

13.3 Muscles and Movement

13.4 Skeletal Disorders
- 13.4.1 Osteoporosis
- 13.4.2 Arthritis

SECTION: 4
CONTINUITY IN LIFE

Unit-14 : REPRODUCTION

14.1 Reproduction

14.2 Methods of Asexual Reproduction
- 14.2.1 Binary Fission
- 14.2.2 Fragmentation
- 14.2.3 Budding
- 14.2.4 Spore Formation
- 14.2.5 Parthenogenesis
- 14.2.6 Vegetative Propagation

14.3 Sexual Reproduction in Plants
- 14.3.1 Sexual Reproduction in Flowering Plants
- 14.3.2 Pollination
- 14.3.3 Development and Structure of Seed
- 14.3.4 Germination of Seed

14.4 Sexual Reproduction in Animals
- 14.4.1 Formation of Gametes (Gametogenesis)
- 14.4.2 Fertilization
- 14.4.3 Reproduction in Rabbit
- 14.4.4 Growth in Human Population and its Consequences
- 14.4.5 Aids (A Sexually Transmitted Disease)

Unit-15 : INHERITANCE

15.1 Introduction to Genetics

15.2 Chromosomes and Genes

15.3 Mendel's Laws of Inheritance
15.3.1 Mendel's Law of Segregation
15.3.2 Mendel's Law of Independent Assortment
15.4 Co-Dominance and Incomplete Dominance
15.5 Variations and Evolution
15.5.1 Variations lead to Evolution
15.5.2 Artificial Selection

SECTION: 5
ECOLOGY

Unit-16 : MAN AND HIS ENVIRONMENT

16.1 Levels of Ecological Organization
16.1.1 Components of Ecosystem
16.2 Flow of Materials and Energy in Ecosystems
16.2.1 Flow of Energy 16.2.2 Flow of Materials
16.2.3 Ecological Pyramids 16.2.4 Biogeochemical Cycles
16.3 Interactions in Ecosystems
16.3.1 Raw materials 16.3.2 Process
16.4 Ecosystem Balance and Human Impacts
16.4.1 Global Warming 16.4.2 Acid Rain
16.4.3 Deforestation 16.4.4 Overpopulation
16.4.5 Urbanization
16.5 Pollution; Consequences and Control
16.5.1 Air Pollution 16.5.2 Water Pollution
16.5.3 Land Pollution
16.6 Conservation of Nature
16.6.1 Plans for the conservation of Nature

Unit-17 : BIOTECHNOLOGY

17.1 Introduction of Biotechnology Scope and Importance of Biotechnology
17.2 Fermentation
17.2.1 Fermentation in Biotechnology
17.2.2 Fermenter
17.3 Genetic Engineering
17.3.1 Objectives of Genetic Engineering
17.3.2 Basic Steps in Genetic Engineering
17.3.3 Achievements of Genetic Engineering
17.4 Single-Cell Protein

Unit-18 : PHARMACOLOGY

18.1 Medicinal Drugs (Principle usage of important Medicinal Drugs)
18.2 Addictive Drugs (Drug Addiction and associated problems)
18.3 Antibiotics and Vaccines

LIST OF PRACTICALS FOR CLASS-IX (PART-I)

1. Study of different types of bacteria, Amoeba, Paramecium, Volvox with the help of prepared slides and from fresh culture /charts.
2. Study of external morphology of mustard plant and microscopic examination of root, stem, leaf, flower, fruit and seeds.
3. Identification of major organs and organ systems in a dissected frog (Dissection by demonstrator / teacher).
4. Recognition of different animals and plants from fresh and preserved specimens on the basis of apparent distinguishing taxonomic characters.

5. Evaluation of graphs of a population of an insect (endangered due to excessive use of insecticides) and interpret the reasons for its endangered status.
6. Use of microscope to observe the movement of small objects.
7. Microscopic examination of an animal cell (e.g. from frog's blood) and a plant cell (e.g. from onion epidermis) using an appropriate temporary techniques such as iodine or methylene blue.
8. Identification of different parts of the cell from fresh preparations.
9. Preparation of the wet mounts of tissue from flowering plants and study of plant and animal tissues from charts and prepared slides.
10. Determination of the effect of tonicity on plasmolysis and deplasmolysis in plant cells or in red blood cell.
11. Data collection on the number of stomata per unit area on various plant leaves that grow in areas of differing humidity and compilation of data and graph it to determine whether there is a relationship between the variables.
12. Observation of various stages of mitosis and meiosis by slides, model and charts.
13. Preparations of root tip squashes and study stages of mitosis
14. To demonstrate working of an enzyme in vitro e.g. pepsin working on meat in test tube.
15. Experiment to test enzyme action by putting diastase in a starch solution in test tube at 37^0 C and after fifteen minutes performing iodine test for presence of starch.
16. To demonstrate the process of photosynthesis using aquatic plant, Hydrilla.
17. Identification and labeling of the cellular and tissue structure in the CS of a leaf through observation under the microscope.
18. To investigate the necessity of chlorophyll, light and carbon dioxide for photosynthesis.
19. To demonstrate the process of respiration in germinating seed by using limewater.
20. To investigate the release of carbon dioxide and heat during aerobic respiration in germinating seeds.
21. Food tests: Benedict's test for reducing sugar, iodine test for starch, spot test and emulsion test for fat, and Biuret test for protein in solution.
22. Microscopic examination of a transverse section of the small intestine to show the villi.
23. Measurement of differences in length / weight of raw potato strips in concentrated salt solution and water.
24. Observation of root hairs on growing root of onion, carrot etc.
25. Microscopic observations of the structure and number of stomata in the epidermal peel of a leaf.
26. To investigate the rate of water loss at the two surfaces of a leaf by using cobalt chloride paper.
27. To investigate transpiration in potted plant under a bell jar.
28. Identification of xylem and phloem tissues in the prepared slides of stem, root and leaf.
29. To investigate the pathway of water in parts of plant using a suitable stain and compare sizes of various types of cells.
30. Identification of red and white blood cells under the light microscope on prepared slides and in diagrams and photomicrographs.
31. To investigate the effect of physical activity on pulse rate.
    Experiment to show the capillary flow in fishtail or fin or frog's web.

LIST OF PRACTICALS FOR CLASS-X (PART-II)

1. Activity to compare the breathing rate at rest and after exercise.
2. Experiment to find out how much air a person can take into his / her lungs.
3. Demonstration of the presence of carbon dioxide in the exhaled air.
4. Demonstration of the presence of tar in cigarette smoke and also showing by charts and pictures the difference of lungs of smokers and non-smokers.
5. Examination of the structure of the kidney (Sheep kidney / model).
6. Observation and recording of the difference in quickness of response of the two types of co-ordination (by asking a student to say few words in front of class and observe the changes in heart beat).

7. Experiment to observe the contraction in the shin muscle of frog in a petri dish filled with methylene blue and using 12V.DC current.
8. Identify the different parts and draw a labeled diagram of longitudinal of eye of a sheep or bull.
9. Investigation of the nature of bone (by putting three pieces of the bone of lamb in water, NaOH and dilute HCL).
10. Observation of binary fission in Amoeba by using slides, photomicrograph and charts.
11. Observation of budding in yeast from prepared slides.
12. Examination of a bulb (onion), corm (colocasia), rhizome (ginger) and stem tuber (potato) and their cultivation to get new plants.
13. Propagation by stem cutting (rose or any locally available plant) and bryophyllum leaf.
14. Examination of mustard flower, gram seed and maize grain.
15. Investigation of the conditions for seed germination.
16. Recording the heights of class fellows to predict which kind of variation is it and presentation of the data of class fellows height in graphical form (either histogram or bar chart).
17. Investigation of an ecosystem e.g. an aquarium or a pond.
18. Investigation about the role of yeast and bacteria in the fermentation of flour and milk.

Prescribed Book: Biology for Part – II (Class –X)

Authors: Dr. Rass Masood , Dr. Farhat Iqbal , Dr. Saraphine Salik , Farhat Zahra

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