BIOLOGY

Theory Part-I	**60 Marks**	**Time:2:00 Hours**
Theory Part-II	**60 Marks**	**Time:2:00 Hours**
Practical	**30 Marks**	
Total	**150 Marks**	

PART – I (Class –IX) 60 Marks Time: 2:00 Hours

Unit 1 INTRODUCTION TO BIOLOGY

- **1.1)** Introduction to Biology
  - **1.1.1** Divisions and Branches of Biology
  - **1.1.2** Relationship of Biology to other Sciences
  - **1.1.3** Quran and Biology
- **1.2)** The Levels of Organization
  - **1.2.1** Cellular Organizations

Unit 2 SOLVING A BIOLOGICAL PROBLEM

- **2.1)** Biological Method
  - **2.1.1** Biological Problem, Hypothesis, Deductions and Experiments
  - **2.1.2** Theory, Law and Principle
- **2.2**) Data Organization and Data Analysis
- **2.3**) Mathematics as an Integral Part of Scientific Process

Unit 3 BIODIVERSITY

- **3.1)** Biodiversity
- **3.2)** Classification – Aims and Principles
- **3.3)** History of Classification Systems
  - **3.3.1** Two-Kingdom Classification System
  - **3.3.2** Three-Kingdom Classification System
  - **3.3.3** Five-Kingdom Classification System
- **3.4)** The Five Kingdoms
- **3.5)** Binomial Nomenclature
- **3.6)** Conservation of Biodiversity

- **3.6.1** Impact of human beings on Biodiversity
- **3.6.2** Deforestation Species in Pakistan
- **3.6.3** Steps for the Conservation of Biodiversity
- **3.6.4** Endangered Species in Pakistan

Unit 4 CELLS AND TISSUES

- **4.1)** Microscopy and the Emergence of Cell Theory
  - **4.1.1** Light Microscopy and Electron Microscopy
  - **4.1.2** History of the Formulation of Cell Theory
- **4.2)** Cellular Structures and Functions
  - **4.2.1** Cell Wall
  - **4.2.2** Cell Membrane
  - **4.2.3** Cytoplasm
  - **4.2.4** Cytoskeleton
  - **4.2.5** Cell Organelles
  - **4.2.6** Difference between Prokaryotic and Eukaryotic Cells
  - **4.2.7** Relationship between Cell Function and Cell Structure
- **4.3)** Cell size and Surface Area to Volume Ratio
- **4.4)** Passage of Molecules into and out of Cells
- **4.5)** Animal and Plant Tissues

Unit 5 CELL CYCLE

- **5.1)** Cell Cycle
- **5.2)** Mitosis
  - **5.2.1** Phases of Mitosis
  - **5.2.2** Significance of Mitosis
- **5.3)** Meiosis
  - **5.3.1** Phases of Meiosis
  - **5.3.2** Significance of Meiosis
- **5.4)** Apoptosis and Necrosis

Unit 6 ENZYMES

- **6.1)** Characteristics of Enzymes
  - **6.1.1** Factors Affecting the Rate of Enzyme Action
- **6.2)** Mechanism of Enzyme Action
- **6.3)** Specificity of Enzymes

Unit 7 BIOENERGETICS

- **7.1)** Bioenergetics and the Role of ATP
- **7.2)** Photosynthesis
  - **7.2.1** Mechanism of Photosynthesis
  - **7.2.2** Role of Chlorophyll and Light
  - **7.2.3** Limiting Factors in Photosynthesis
- **7.3)** Respiration
  - **7.3.1** Aerobic and Anaerobic Respiration
  - **7.3.2** Mechanism of Respiration
  - **7.3.3** The Energy Budget of Respiration

Unit 8 NUTRITION

- **8.1)** Mineral Nutrition in Plants
- **8.2)** Components of Human Food
  - **8.2.1** Effects of Water and Dietary Fibers
  - **8.2.2** Balanced Diet
  - **8.2.3** Problems Related to Nutrition
- **8.3)** Digestion in Human
  - **8.3.1** Human Alimentary Canal
  - **8.3.2** Role of Liver
- **8.4)** Disorders of Gut

Unit 9 TRANSPORT

- **9.1)** Transport in Plants
  - **9.1.1** Water and Ion Uptake
  - **9.1.2** Transpiration
  - **9.1.3** Transport of Water
  - **9.1.4** Transport of Food
- **9.2)** Transport in Human
  - **9.2.1** Blood
  - **9.2.2** Human Heart
  - **9.2.3** Blood Vessels
  - **9.2.4** General Plan of Human Blood Circulatory System
- **9.3)** Cardiovascular Disorders
  - **9.3.1** Atherosclerosis and Arteriosclerosis
  - **9.3.2** Myocardial Infarction