**[BIOLOGY](http://www.result.pk)**

[For Class IX (marks 65)](http://www.result.pk)

**[1. INTRODUCTION TO BIOLOGY](http://www.result.pk)**

[1.1 Introduction to Biology](http://www.result.pk)

[1.1.1 Definition of Biology](http://www.result.pk)

[1.1.2 Divisions and Branches of Biology](http://www.result.pk)

[1.1.3 Relation of Biology to other sciences](http://www.result.pk)

[1.1.4 Quran instructs to reveal the study of Life](http://www.result.pk)

[1.2 The Levels of Organization](http://www.result.pk)

**[2. SOLVING A BIOLOGICAL PROBLEM](http://www.result.pk)**

[2.1 Biological Method](http://www.result.pk)

[2.1.1 Scientific problem, Hypotheses, Deductions and Experiments](http://www.result.pk)

[2.1.2 Theory, Law and Principle](http://www.result.pk)

[2.1.3 Data organization and Data analysis](http://www.result.pk)

[2.1.4 Mathematics as an integral part of the Scientific Process](http://www.result.pk)

**[3. BIODIVERSITY](http://www.result.pk)**

[3.1 Definition and Introduction of Biodiversity](http://www.result.pk)

[3.2 Aims and Principles of Classification](http://www.result.pk)

[3.3 History of Classification Systems](http://www.result.pk)

[3.3.1 Two-Kingdom Classification System](http://www.result.pk)

[3.3.2 Three-Kingdom Classification System](http://www.result.pk)

[3.3.3 Five-Kingdom Classification System](http://www.result.pk)

[3.4 The Five Kingdoms](http://www.result.pk)

[3.5 Binomial Nomenclature](http://www.result.pk)

[3.6 Conservation of Biodiversity](http://www.result.pk)

**[4. CELLS AND TISSUES](http://www.result.pk)**

**[4](http://www.result.pk)**[.1 Microscopy and the Emergence of Cell Theory](http://www.result.pk)

[4.1.1 Light microscopy and Electron microscopy](http://www.result.pk)

[4.1.2 History of the formulation of cell theory](http://www.result.pk)

[4.2 Cellular Structures and Functions](http://www.result.pk)

[4.2.1 Structures and Functions of cell Organelles](http://www.result.pk)

[4.2.2 Relationship between cell Function and cell Structure](http://www.result.pk)

[4.2.3 Difference between Prokaryotic and Eukaryotic cells](http://www.result.pk)

[4.2.4 Relationship between cell Size and Shape and Surface Area to Volume ratio](http://www.result.pk)

[4.3 Passage of Molecules Into and Out of Cells](http://www.result.pk)

[4.4 Tissues (types of Plant Tissues and types of Animal Tissues)](http://www.result.pk)

**[5. CELL CYCLE](http://www.result.pk)**

[5.1 Cell Cycle (Interphase and Division)](http://www.result.pk)

[5.2 Mitosis](http://www.result.pk)

[5.2.1 Phases of Mitosis](http://www.result.pk)

[5.2.2 Significance of Mitosis](http://www.result.pk)

[5.3 Meiosis](http://www.result.pk)

[5.3.1 Phases of Meiosis](http://www.result.pk)

[5.3.2 Significance of Meiosis](http://www.result.pk)

[5.4 Necrosis and Apoptosis](http://www.result.pk)

**[6. ENZYMES](http://www.result.pk)**

[6.1 Definition & Characteristics of Enzymes](http://www.result.pk)

[6.2 Mechanism of Enzyme Action (Lock-n-Key Model)](http://www.result.pk)

[6.3 Specificity of Enzymes](http://www.result.pk)

**[7. BIOENERGETICS](http://www.result.pk)**

[7.1 Introduction and the Role of ATP](http://www.result.pk)

[7.2 Photosynthesis](http://www.result.pk)

[7.2.1 Introduction and Equation](http://www.result.pk)

[7.2.2 Role of Chlorophyll and Light](http://www.result.pk)

[7.2.3 Limiting Factors in Photosynthesis](http://www.result.pk)

[7.2.4 Adaptations in Leaf Structure for Photosynthesis](http://www.result.pk)

[7.3 Respiration](http://www.result.pk)

[7.3.1 Aerobic Respiration, Anaerobic Respiration](http://www.result.pk)

[7.3.2 Mechanism of Respiration (Glycolysis, Krebs Cycle, Electron Transport Chain)](http://www.result.pk)

**[8. NUTRITION](http://www.result.pk)**

[8.1 Introduction](http://www.result.pk)

[8.2 Nutrition in Plants](http://www.result.pk)

[8.2.1 Nutrition and Nutrients (Plant Nutrients and Modes of Nutrition)](http://www.result.pk)

[8.2.2 Mineral Nutrition in Plants (Role of Nitrates and Magnesium and effects of their deficiencies)](http://www.result.pk)

[8.3 Nutrition in Man](http://www.result.pk)

[8.3.1 Major Components of Food (Carbohydrates, Proteins and Fats)](http://www.result.pk)

[8.3.2 Effects of Vitamins (A, C and E) in terms of their; sources, metabolic functions and deficiencies](http://www.result.pk)

[8.3.3 Effects of Minerals (Calcium and Iron) in terms of their; sources, metabolic functions and deficiencies](http://www.result.pk)

[8.3.4 Effects of Water and Dietary fibers in terms of their; sources and metabolic functions](http://www.result.pk)

[8.3.5 Balanced Diet (Concept, Diet related to age, sex and activity)](http://www.result.pk)

[8.3.6 Problems related to Nutrition](http://www.result.pk)

[8.3.6.1 Protein Energy Malnutrition](http://www.result.pk)

[8.3.6.2 Mineral Deficiency Diseases (Scurvy, Rickets, Night blindness)](http://www.result.pk)

[8.3.6.3 Famine (Unequal distribution, Drought, Flooding, Increasing population)](http://www.result.pk)

[8.4 Digestion in Man](http://www.result.pk)

[8.4.1 Ingestion, Digestion, Absorption, Assimilation and Egestion](http://www.result.pk)

[8.4.2 Identification and Functions of the main regions of human Alimentary Canal](http://www.result.pk)

[8.4.3 Role of liver in digestion, glucose and amino acid metabolism and formation of urea](http://www.result.pk)

[8.4.4 Absorption of Food (Structure of Villus, Role of capillaries and lacteals)](http://www.result.pk)

[8.5 Disorders of Gut (Diarrhea, Constipation, Appendicitis, Threadworm diseases)](http://www.result.pk)

**[9. TRANSPORT](http://www.result.pk)**

[9.1 Introduction](http://www.result.pk)

[9.2 Transport in Plants](http://www.result.pk)

[9.2.1 Water and ion uptake (Structure and function of root hairs)](http://www.result.pk)

[9.2.2 Transpiration](http://www.result.pk)

[9.2.2.1 Introduction and Significance](http://www.result.pk)

[9.2.2.2 Factors affecting the rate of Transpiration](http://www.result.pk)

[9.2.3 Transportation of Food and Water](http://www.result.pk)

[9.2.3.1 Pathway of water and food in stem](http://www.result.pk)

[9.2.3.2 Structure and function of Xylem and Phloem](http://www.result.pk)

[9.3 Transport in Man](http://www.result.pk)

[9.3.1 Blood](http://www.result.pk)

[9.3.1.1 Components of Blood and their Functions](http://www.result.pk)

[9.3.1.2 Blood Groups and Blood Transfusion](http://www.result.pk)

[9.3.1.3 Disorders of Blood (Leukemia and Thalassemia)](http://www.result.pk)

[9.3.2 Human Heart](http://www.result.pk)

[9.3.2.1 Structure of Heart](http://www.result.pk)

[9.3.2.2 Functioning of Heart (Circulation through heart, Heartbeat, Heart rate)](http://www.result.pk)

[9.3.3 Blood Vessels](http://www.result.pk)

[9.3.4 General Plan of Human Blood Circulatory System](http://www.result.pk)

[9.3.5 Cardiovascular Disorders (Atherosclerosis, Arteriosclerosis, Myocardial Infarction)](http://www.result.pk)

**[RECOMMENDED REFERENCE BOOKS FOR CLASS IX](http://www.result.pk)**

 [The question paper will be syllabus oriented. However, the following book is recommended for reference and supplementary reading:](http://www.result.pk)

 [1. Biology](http://www.result.pk)

[Developed by the Punjab Textbook Board, Lahore and](http://www.result.pk)

[Published by PLD Publishers, Lahore](http://www.result.pk)