**PAPER-II**

**Total Marks: 100**

1. **Plant Physiology:** Plant water relations, osmotic quantities, absorptions,

transpiration, role of essential mineral elements, their uptake and distribution. Growth

and development, Plant hormones, Photoperiodism, Vernalization, Dormancy and seed

germination. Biochemistry of Carbohydrates, Proteins and Fats with reference to plants.

Enzymes. Plant pigments. Photophosphorylation; Path of carbon in photosynthesis;

Oxidative phosphorylation (respiration), Nitrogen and Fat metabolism.

2. **Ecology:** Influence of climatic, edaphic and biotic factors on plant growth.

Sampling techniques. Major formations in relation to climatic zones. Concepts of

ecosystems and their productivity, Ecological energetics, pyramids, food chains and

trophic levels. Salinity and Waterlogging in Pakistan: Causes and reclamation of

salinity, soil erosion, methods of control and conservation. Pollution and conservation of

natural resources. Vegetation of Pakistan.

3. **Cytology:** Detailed study of ultra-structure of cell and its components;

Chromosomes, Mitosis and meiosis, significance, Cancer and apoptosis.

4. **Genetics:**

a. **Mendelian Genetics:** Linkage, Crossing over, Sex-linked

inheritance, Mutation, Polyploidy.

b. **Biochemical Genetics:** Biochemical nature of hereditary

material, fine structure of genes: Transduction and Transformation.

c. **Molecular Genetics:** Replication, Transcription, Genetic

codes and Translation.

5. **Evolution:** Theories of Evolution, Lamarckism, Darwinism, Neo-Darwinism.

Hardy-Weinberg’s Law, Gene frequency, Adaptive mtations.

**RECOMMENDED BOOKS**

*1. Taiz, L. and E. Zeiger 2002. Plant Physiology. Third Edition sinauers Pub. Co.*

*Inc. California.*

*2. Salisbury, F.B. and C.W. Ross 1992. Plant Phsiology. Wadsworth publishing*

*company, Bemont, California.*

*3. Odum, E.P. 1985. Basic Ecology. W.B. Saunders.*

*4. Smith, R.L. 1998. Elements of Ecology. Harper & Row Publishers, New York.*

*5. Waisel, Y. 1972. Biology of Halophytes.*

*6. Gardner, E.J., Simmons, M. J. and Snustad, D.P. 1991. Principles of Genetics.*

*8th Edition. John Willey and Sons, New York.*

*7. Strickberger, M. V. 1985. Genetics. 3rd Edition. MacMillan Press Ltd., London.*

*8. Snustad, D.P. and Simmons, M. J. 2002. Principles of Genetics. 3rd Edition. John*

*Willey and Sons, New York.*

*9. Taylor, T.N. and Taylor, E.D. 1987. The Biology and Evolution of Fossil Plants,*

*Prentice Hall.*