Marks : 200

PAPER - I (Marks:100)

Course Outline

1. Thallophytes

(a) Phycology: Origin, evolution, distribution and classification with reference to range, structure, life history, ecology and economic importance of the main groups of algae.

(b) Mycology & Plant Pathology: Structure, development reproduction, classification; phylogeny, physiology and economic importance of the main groups of fungi, Diseases of economic importance and general principles of their control.

2. Bryology: Evolution of gametophytes and sporophytes.

3. Peteridophyta and Gymnosperms: General structure fife history and evolutionary tendencies, Ontogeny and structure of seed.

4. Anatomy and Embryology: Primary and secondary tissues, Meristems, tissue differentiation, normal and abnormal secondary growth, anatomy of leaf, stem and root, Micro and megasporogenesis, pollination mechanism, fertilization, development of embryo and endosperm, seed dispersal.

5. Taxonomy of Angiosperms: Systems of classification, Rules of botanical nomenclature, Concepts of speciation, Introduction to modern trends in plant taxonomy: Bio-systematic, chemotaxonomy and numerical taxonomy.

PAPER - II (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, Photophosphorelation, path of carbon in photosynthesis, oxidative phosophorelation (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, efficiency, pyramids, food chains and trophic levels.
3. Salinity and water logging in Pakistan, causes. reclamation, soil erosion, methods of control and conservation. Pollution and conservation of natural resources.
4. **Cytology:** Detailed study of ultrastructure of cell. Mitosis and meiosos. Significance of meiosis.
5. **Genetics**

1. Mendalian Genetics, Linkage, crossing over, sex linked genes, lethals, balanced lethals. Mutation, polyploidy.
2. Biochemical Genetics: Biochemical nature of hereditary material, genetic Code, Fine Structure of gene, transduction and transformation.

6. Evolution Theories of evolution, Neo-Darwinism Neo-Lamarckism. Adaptive mutations.

Suggested Books

1	An Introduction to Plant Diseases	Wheeler, B.E.J.
2.	An Introduction to Plant Anatomy	Eames, A.G. & Mc. Daniels, L.H.
3.	An Introduction to Embryology of Angiosperms	Maheshveri
4.	Plant Taxonomy and Biosystematics	Clive, A. Stace
5.	The Biology of the Algae (2/e)	Round, F.E.
6.	The Structure and Life of Bryophytes	Watson, E.V.
7.	The Morphology of Pteridophytes	Sporne, K.R.
8.	The Morphology of Gymnosperms	Sporne, K.R.
9.	Cytology	Wilson, G.B. & Morrison J.H.

10.	Diagnosis & Improvement of Saline & Alkali Soils	Richards, L.A. (ed)
11.	Plant Physiology (2/e)	Frank, B. Salisbury & Cleon W. Ross
12.	Plant & the Ecosystem	Billings, W.D.
13.	Principles of Genetics	Gardner, E.J.
14.	Morphology of Plants	Bold, Harold, C.
15.	Introduction to Fungi	Webster, J.
16.	Plant growth and development	Leopold, A.C. & Kriedmann, P.E
17.	Terrestrial Plant Ecology	Barbour, M.G. & Bark, J.H. Titts, W.D.