

SYLLABUS FOR THE SUBJECT OF AGRICULTURE PAPER-I

Total Marks: 100

Natural resources (land, water, biological and climatic) of Pakistan and their impact on crop production. Climatic factors and their relationship with crop growth processes like photosynthesis, respiration and transpiration. Agro-ecological zones of Pakistan and their features. Dry farming. Organic farming for agricultural environmental pollution management. Use of bio-fertilizers, biopesticides and natural products. Biological N₂ fixation and factors affecting biological N₂ fixation. Source-sink relationships in crop plants. Weed-crop interference; competition and allelopathic interactions.

Role of Agri. Extension in current and future agriculture in Pakistan. Methods and steps to evaluate extension activities. Global overview of Agri. extension. Types, principles, strategies and significance of audio-visual aids in Agri. Extension.

Importance, potential and principles of Agro-forestry. Various agro-forestry systems. Forest products and utilization features of range management in Pakistan. Major wildlife species found in Pakistan, their morphological features, behaviour and habitats. National forest policy and other land use policies. Biodiversity, its conservation, threats and losses, Impact of environmental changes on biodiversity.

Role of Indus Basin Irrigation System in the development of agriculture in Pakistan. Current and future scope of farm mechanization in Pakistan.

Food processing and preservation. Food industries of Pakistan and their role in the national economy. WTO implications to food business. Food analysis, contamination of foods business. Food analysis, contamination of foods and its control measures. Processing and uses of dairy products. Basic nutrition requirements of human body and their relationship with nutrition related diseases.

Indicators and issues of agriculture sector in Pakistan and their role in national economy. Land tenure systems and land reforms in Pakistan. Principles, objectives and functions of WTO. Role of IT in agriculture.

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PAPER-II

Total Marks: 100

Concept of genetics. Role of genetics in crop improvement. Chemical composition of hereditary material. Molecular basis of genetic code. Basic control system in gene expression. Variation-basis of plant breeding, its creation and exploitation. Breeding strategies. Breeding methods of self, cross and asexually propagated crops. Process of variety development.

Concept of modern breeding; doubled haploid breeding, marker-assisted breeding, mutation breeding, heteroploid breeding, hybrid breeding and transgenic breeding. Various techniques of developing transgenic plants and scope of transgenic plants in plant breeding. Impact of cultivation of transgenic crops on biodiversity. Role of agri-biotechnology in crop improvement. Breeding cultivars for marginal lands. Role of edible oilseeds in agriculture and economy of Pakistan. Development of low erucic acid and glucosinolate (double low) varieties in rapeseed and mustard crops.

Resistance breeding. Host-plant genetic resistance. Genetic and physiological mechanisms of stress tolerance in crop plants. Major insect pests of important agricultural crops. Principles and methods of insect control. Entomological industries; Apiculture, Sericulture and Lac-culture. Types of agricultural pollution and its management. Mode of action, hazards and safety measures of insecticides. IPM and economics of pest management.

Causes, nature of losses and economic importance of plant diseases, and principles of their control. Economic importance, transmission and control of plant viruses. Various methods to control and manage plant diseases. Methods of screening of crop germplasm for the sources of disease resistance. Physiological requirements and problems in mushroom cultivation. nutritional value of mushroom and remedial measures of mushroom poisoning.

Classification, propagation, management practices and post harvest handling of Horticultural crops. Role of tissue culture in agriculture. Cultivation, production, chemical and pharmacological properties of medicinal plants. Propagation methods, management practices and marketing of fruit and ornamental plants nurseries.

Soil formation and Soil profile. Types of soil, salt affected and waterlogged soils, and their reclamation and management. Factors affecting crop growth and growth expression models. Sources and significance of organic matter in agriculture. Soil fertility problems in Pakistani soils. Integrated plant nutritional system. Kinds and levels of soil survey, and application of GIS and remote sensing in soil survey. Types, control and management of soil erosion.

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