

PANJAB UNIVERSITY, CHANDIGARH

B.Sc. (General) [SEMESTER-VI]

PAPER-A : PLANT PHYSIOLOGY-II

Objectives : The main objective of this paper is to familiarize the students with growth and metabolic processes of the plants. It also deals with the plant development, differentiation and their regulatory mechanism along with basic concepts in tissue culture.

Teaching Methodology : Teaching methodology includes series of lectures making use of charts, transparencies, LCD, Models, slides, practical demonstrations, extension lectures from experts, field visits, discussions, quiz competitions etc. In practicals, students will familiarize with the various experiments pertaining to theory syllabus.

UNIT-I

Photosynthesis : Significance, historical aspect; photosynthetic pigments; action spectra and enhancement effects; concept of two photosystems, cyclic and non-cyclic photophosphorylation; Calvin cycle; C₄ pathway; CAM plants; photorespiration; factors affecting photosynthesis; transport of organic substances : Mechanism of phloem transport, source-sink relationship, factors affecting translocation.

UNIT-II

Respiration : ATP – The biological energy currency; aerobic and anaerobic respiration; Krebs cycle; electron transport mechanism (Chemi-osmotic theory); redox potential; oxidative phosphorylation; pentose phosphate pathway; respiratory quotient.

UNIT-III

Growth and Development : Definitions; phases of growth and development; kinetics of growth, factors affecting growth; plant movements; the concept of photoperiodism, physiology of flowering; florigen concept; roles of plant hormones – auxins, gibberellins, cytokinins, abscisic acid and ethylene, history of their discovery.

UNIT-IV

Biotechnology : Functional definition; basic aspects of plant tissue culture, its applications and somatic hybridization.

PAPER-B : ECONOMIC BOTANY

Objectives : The basic objective of this paper is aimed to give an insight into plant wealth such as medicinal plants; crop plants; beverages; spices; condiments; sugar; fiber; pulp and oil yielding plants of commercial and economic importance. Both the aspects of this paper give a sound basis of ecology and economic botany so that students can venture into fields like Environmental Biology, Conservation Biology, Forestry, Agriculture, Horticulture and Crop production etc.

Teaching Methodology : Teaching methodology includes series of lectures making use of charts, transparencies, LCD, Models, slides, practical demonstrations, extension lectures from experts, field visits, discussions, quiz competitions etc. In practicals, students would be provided with fresh/preserved materials for their morphological and anatomical studies making use of microscopes and binoculars and hands-on tools/equipment etc.

UNIT-I

Crop production : Area of cultivation, soil requirement, cultivation practices and high yielding varieties of :

- (i) Cereals (Wheat, Rice and Maize)
- (ii) Fibres (Cotton)
- (iii) Vegetables (Potato)

UNIT-II

Crop production : Area of cultivation, soil requirement, cultivation practices and high yielding varieties of :

- (i) Fruits (Mango, Grapes, Lemon)
- (ii) Sugar-yielding plants (Sugarcane)
- (iii) Oil-yielding plants (Groundnut, Mustard)

UNIT-III

Elementary knowledge of the following plants (Botanical names, families, parts used and economic importance) :

- (i) Wheat, Maize, Rice, Moong, Gram (Food).
- (ii) Teak, Shisham, Deodar, Sal (Timbers).
- (iii) Cotton, Jute, Coir, Flax (Fibres).
- (iv) Fennel, Coriander, Turmeric, Ginger, Mint, Clove (Spices and Condiments).

UNIT-IV

Elementary knowledge of the following plants (Botanical names, families, parts used and economic importance) :

- (i) Bamboo, Eucalyptus (Pulp plants).
- (ii) Liquorice, Belladonna, Aconite, Ashwagandha, Arjun, Poppy, Amla (Medicinal plants).
- (iii) Tea and Coffee (Beverages).

Forestry : Forest conservation, wood seasoning and its preservation.