

CBO-405 PLANT ANATOMY AND ECOLOGY

Unit-I Plant Anatomy

Meristems: Classification of Meristems; Apical Meristems: Theories of Shoot Apical Meristems: Apical Cell Theory, Histogenic layer theory, Anneau initial & meristem d'attente theory.

Root Apex: Theories of Root apex organization: Apical Cell Theory, Korper-Kappe theory, Concept of quiescent centre, development of lateral roots and root hairs.

Transition of vegetative shoot apex into reproductive shoot apex.

Development of Plant Tissues: Simple and Complex tissues.

Vascular Elements: Functional Differentiation.

Wood Anatomy: Ontogeny of secondary vascular tissues, Growth rings, Heart wood & Sap wood, Porous & non-porous wood, wood parenchyma.

Unit-II Plant Anatomy

Vascular Cambium: origin, structure, seasonal changes in cambium activity, cambium in wound healing and grafting, cambium in monocotyledons.

Anomalous Secondary Growth in *Aristolochia* stem, *Mirabilis* stem, *Bougainvillea* stem and *Chenopodium* stem.

Structural variability in Leaves of *Helianthus*, *Aloe*, *Calotropis*, *Typha*, *Nymphaea* and Maize.

Systematic Plant Anatomy: with special references to trichomes, stomata, leaf anatomy, nodal anatomy, cellular contents, wood anatomy and flower anatomy.

Main Reference(s):

Singh V, Pande P C and Jain D K (1998) **Anatomy of Seed Plants**, Rastogi Publications, Meerut (1st Edition's Reprint).

Pandey B P (1997) **Plant Anatomy**, S Chand & Co. Ltd, New Delhi. (1st Edition's Reprint).

E John Jothi Prakash (2000) **A Text Book of Plant Anatomy**, Emkay Publications, Delhi. (2nd Revised Edition).

Tayal M S (2001) **Plant Anatomy**, Rastogi Publications, Meerut (5th Edition's Reprint).

Unit-III Plant Ecology

Physiological characters and methods of plant community

Ecosystem - Structure and Function, Types-terrestrial (forest and grass land) and aquatic (fresh water, marine and estuarine), Energy flow, Productivity, Biogeochemical cycle (Carbon and Sulphur), Homeostasis, Optimization and Evolution

Environmental problems- Biodiversity, Biopiracy, Eco-terrorism, Desertification and Sustainable development

Environment pollution – Kinds, Sources, Effects on plants and ecosystem,

Conventional and Non-Conventional energy sources.

Unit-IV Plant Ecology

Phytogeography – Plant community of the world (terrestrial and aquatic biomes), Phyto-geographical region of world (vegetation belt), Bio-geographical zones (soil, climate, flora and vegetation) of India

Bioremediation and Environment clean up-Bioremediation, Need and Scope, Application, Future outlook and Phyto-remediation.

Conservation - Introduction, Forest conservation (Resources and importance),

National Parks and Biosphere Reserve conservation.

Main Reference(s):

Sharma P D (2003) **Ecology and Environment**, Rastogi Publications, Meerut. (7th Edition's Reprint).

Agrawal K C (2001) **Fundamentals of Environmental Biology**, Nidhi Publishers (India), Bikaner. (1st Edition).

Other Reference(s):

Subrahmanyam N S and Sambamurty A V S S (2000) **Ecology**, Narosa Publishing House, New Delhi. (1st Edition).

Kormondy E J (2002) **Concept of Ecology**, Prentice-Hall of India Pvt Ltd., New Delhi (12th Indian Edition Reprint).