Teaching Plan
S. Y. B. Sc. [Botany]: 2019 - 20
Plant Anatomy and Embryology
(Semester II, Paper I)

Sr. No	Month	Topics
1	Dec	**Plant anatomy:** **Introduction** Definition, scope of plant anatomy and types of tissues **Epidermal tissue system** Structure and function of epidermal tissue system, uniseriate and multiseriate epidermis, stomata: structure, types and functions, epidermal outgrowth: glandular and non-glandular. **Revision, Assignment**
2	Jan	**Mechanical tissue system** Principles involved in distribution of mechanical tissues – inflexibility, incompressibility, inextensibility and shearing stress, tissues providing mechanical support, their distribution in leaf, stem and root of dicots and monocots. **Vascular tissue system** Structure and function of xylem, phloem and cambium **Revision, Assignment**
3	Feb	**Normal secondary growth** Introduction, cambium and its role, process in stems of Helianthus annus and Annona sqamosa, extrastelar and intrastelar secondary growth, annual rings, periderm, bark, tylosis and lenticel **Revision, Assignment**
4	March	**Anomalous secondary growth** Introduction, causes, anomalous secondary growth in dicot stem (Bignonia) dicot root (Raphanus) and monocot stem (Dracaena) **Revision, Assignment** **Previous Years' Question Paper Discussion**

Sangeethajs

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1	Dec	**Plant Embryology** **Introduction** Definition and scope of plant embryology **Microsporangium and male gametophyte** a. Microsporangium: structure of tetrasporangiate anther, types of tapetum, sporogenous tissue; b. Microsporogenesis: process and its types, types of microspore tetrad; c. Male gametophyte: structure and development of male gametophyte. **Megasporangium and female gametophyte** a. Megasporangium: structure, types of ovules – anatropous, orthotropous, amphitropous, campylotropous, circinotropous **Revision, Assignment**
2	Jan	b. Megasporogenesis: tenuinucellate and crassinucellate ovules, types of megaspore tetrads. c. Female gametophyte: structure of typical embryo sac, types of embryo sacs with examples – monosporic, bisporic and tetrasporic. **Revision, Assignment**
3	Feb	**Fertilization** Mechanism of pollination- entomophily, anemophily, hydrophily, zoophily, germination of pollen grain, double fertilization (syngamy and triple fusion) and its significance. **Revision, Assignment**
4	March	**Endosperm and embryo** a. Endosperm: Types – nuclear, helobial and cellular. b. Embryogeny: structure of dicot and monocot embryo and seed formation. **Revision, Assignment** **Previous Years' Question Paper Discussion**

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Teaching Plan

S.Y.B.Sc. Botany: 2019 - 20

Plant Biotechnology

(Semester II, Paper II)

Sr. No.	Month	Topic	Teacher
1	Dec	**Introduction** Biotechnology- Definition, concept and scope; Interdisciplinary nature of biotechnology.	SMJ
1	Dec	**Enzyme Technology** Introduction, definition and properties of enzymes; Classification of enzymes; Industrial applications of enzymes; Production of amylase, proteases and lipase enzyme; Enzymes immobilization- concept and techniques of immobilization.	SMJ
2	Dec	**Fermentation Technology** Introduction; Liquid and solid state fermentations; Principles of microbial growth; Bioreactors used in fermentations- stirred tank and tubular tower and digestive tank fermenters; Media composition for liquid and solid state fermentations; Industrial applications of fermentation; Downstream processing- citric acid production.	SMJ
3	Dec & Jan	**Environmental Biotechnology** Introduction; Phytoremediation- definition and concept; Methods of phytoremediation- Rhizofilteration, phytoextraction, phytostabilization, phytovolatization, phytodegradation; Environmental sustainability.	SMJ
4	Jan	**Single cell protein** Introduction, Need of proteins in diet, Production of SCP from algae (*Spirulina*) and fungi (Yeast).The economic implications of SCP, Acceptability of SCP. **Revision, Question Paper Discussion and Internal Theory Examination**	SMJ
2	Jan	**Basics of plant genetic engineering** Introduction and structure of DNA, Structure of gene in prokaryotes and eukaryotes- Promoter, coding region and terminator, General method of gene isolation from the plants-DNA isolation, restriction enzymes, restriction digestion of DNA.	SMJ
3	Feb	**Basics of plant genetic engineering** DNA electrophoresis, southern hybridization, lygation of DNA fragments, Gene cloning- vectors used for gene cloning. **Methods of gene transfer in plants**	SMJ

		Direct gene transfer methods- Electroporation, biolystic gene transfer, liposome mediated transfer.	
4	Feb	**Methods of gene transfer in plants** Vector mediated gene transfer- Agrobacterium mediated gene transfer in plants, Ti-plasmid: structure and functions, Ti plasmid based vectors, advantages.	SMJ
5	Mar	**Application of plant genetic engineering in crop improvement.** Introduction, Insect pest resistance, abiotic stress tolerance, herbicide resistance, storage protein quality. **Nano-biotechnology** Definition and concept; Applications of nanotechnology in agriculture (fertilizers and pesticides). **Revision, Question Paper Discussion and Internal Theory Examination**	SMJ

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