

Vijayanagar Sri Krishnadevaraya University, Bellary
Botany Syllabus, B.Sc. III Semester

Code: BOT-301

Univ Code:

Contact Hours: 50 Hours

Workload: 4 hours per week

Credit Points:

Evaluation: Continuous Internal Assessment - 30 marks

Semester and Examination- 70 marks

Paper – III Histology, Anatomy, Embryology and Polynology

Theory:

Unit 1: HISTOLOGY: -

- a. Study of meristematic and permanent tissue, classification of meristems based on origin, function and position theories of Histogen and Tunica Corpus. Structure and function of Parenchyma, Collenchyma, Sclerenchyma, Xylem and phloem. **03 Hrs**
- b. Tissue system: Dermal tissue, structure and functions of epidermis and epidermal hairs including glandular hairs. **02 Hrs**
- c. Ground tissue system: Cortex, endodermis, Pericycle, pith and their structure and function. **01 Hrs**
- d. Vascular tissue system: Types of vascular bundle, radial, conjoint, collateral, Bicollateral and Concentric. **01 Hrs**

Unit 2: ANATOMY: -

- a. Internal structure of Dicot stem – *Tridax* and *Cucurbita*. Monocot stem, Grass, Maize. Dicot leaf – *Tridax* – Monocot leaf – Grass. Normal secondary growth in typical Dicot stem, formation of cambial ring, activity of cambium, secondary xylem. Secondary phloem, Vascular rays sap wood, Heart wood, growth rings, tyloses and periderm. **06 Hrs**
- b. Secondary growth - in typical Dicot root (Ex. *Cicer*). Anomalous secondary growth in the stem of *Bougainvillea* and *Boerhaavia*. **02 Hrs**

Unit 3: EMBRYOLOGY

- a. Historical accounts - Contribution of Indian embryologists P. Maheswari & B.G.L. Swamy **02 Hrs**
- b. Microsporogenesis – Development of anther, development of male gametophyte. **03 Hrs**
- c. Megasporogenesis - Types & Ovules, differentiation of archesporial initials, Formation of megaspores, Types of tetrads, Types of embryosacs Monosporic, Biosporic, (*Allium* type) and Tetrasporic (*Adox* type). Development of Monosporic type of embryosac (*Polygonum* type) Double fertilization, Triple fusion; its significance. **05 Hrs**
- d. Endosperm Types – Cellular, Helobial, free nuclear. Detailed study of cellular, type of endosperms, endosperm haustorium, vermiform appendage. **03 Hrs**
- e. Embryo Types – Dicot and Monocot, development of Dicot embryo – Crucifer type, suspensor, haustorium (definition with examples) **02 Hrs**
- f. Apomixis – a brief account **02 Hrs**
- g. Polyembryony types- causes, induction of polyembryology, significance **02 Hrs**
- h. Pollination types – Self and cross pollination, types of cross pollination and lever mechanism, sensor mechanism, contrivances for cross pollination **03 Hrs**

Unit 4: PALYNOLOGY –

1. Definition, Scope, Pollen morphology – Pollen, Structure, Size and shape of Pollen grains (Spherical, Prolate, subprolate and Periprostate), wall layers and their morphology. (Exine – ectoexine, endoexine) Nexine I, II, III and Intine), Pollen kit. 03 Hrs

Suggested Reference

- Bhojawani, S.S. and Bhatnagar, S.P. 2000. The Embryology of Angiosperms, 4th revised and enlarged edition. Vikas Publishing House, New Delhi.
- Cutter, E.G. 1969. Part. I. Cells and tissues. Edward Arnold, London.
- Cutter, E.G. 1971. Plant Anatomy: Experiment and interpretation. Part II. Organs Edward Arnold, London.
- Easu, K. 1977. Anatomy of seed plants. 2nd edition. John Wiley & Sons, New York.
- Fahn, A. 1974. Plant Anatomy. 2nd edition. Pergamon Press, Oxford.
- Mauseth, J.D. 1988. Plant Anatomy. The Benjamin/Cummings Publishing Co., Inc., Mento Park, California, USA.
- Raven, P.H., Evert, R.F. and Eichhorn, S.E. 1999. Biology of plants. 5th edition. W.H.
- Johri, B.M. 1984. Embryology of Angiosperms. Springer-Verlag, Berlin.
- Maheshwari, P. 1950. An Introduction to Embryology of Angiosperms. Tata McGraw Hill, New York.
- Shukla, A.K. 1999. Biology of Pollen. Atlas Books & Periodicals.
- Raghavan, V. 1986. Embryogenesis in Angiosperms: A Developmental and Experimental Study. Cambridge University Press. New York.

**B. Sc. III Semester Practical Model question Paper
(History, Anatomy, Embryology, Polynology)**

Time: 03 Hrs

Total Marks: 40

I.	Identify the specimen 'A' from given material	-	05	
II.	Mount and sketch of endosperm/embryo 'B' from given material	-		06
III.	Preparation of temporary stained material 'C'.	-	06	
IV.	Identify the slides D,E, F, G, H & I	-		18
V.	Record submission	-		05
			Total	40

**B.Sc. III Semester, Practical Scheme of Evaluation
(Histology, Anatomy, Embryology, Polynology)**

I.	Mount, identify, Sketch label the specimen 'A'			05
	Pollen Mounting	-	02	
	Identification	-	01	
	Sketch / Label	-	02	
II.	Mount and sketch the Endosperm / embryo – 'B' 06			
	Mounting	-	03	
	Identification	-	01	
	Sketch / Label	-	02	
III.	Preparation of temporary stained slide 'C' Sketch label and identify with reason 06			
	Preparation	-	03	
	Sketch / Label	-	01	
	Identification	-	01	
	Reason	-	01	
IV.	Identify the slide D,E , F G, H & I with sketch label with reasons 18			
	Identification	-	01	
	Sketch – Label	-	01	
	Reason	-	01	
	(Two from Histology/two from anatomy/ two from embryology)			
V.	Record submission 05			

Total Marks 40