

BOTANY
B.Sc. Part- III

Scheme		
Min Pass Marks: 36		Max Marks: 100
Paper I	3 Hrs duration	Max.Marks 33
Paper II	3 Hrs duration	Max Marks 33
Paper III	3 Hrs duration	Max. Marks 34
Practical Min. Marks: 18	4 Hrs. duration	Max. Marks 50
		3 hours
		4 hours

Duration of examination of each theory paper-

Duration of examination of practicals -

Note:

1. There will be 5 question in each paper all questions are compulsory. Candidate has to answer all questions in the main answer book only.
2. Q.No. will have 20 very short answer type Questions (not more than 20 words) of half marks each covering entire syllabus.
3. Each paper is divided into four units. There will be one question from each unit. These Q.No. 2 to 5 will have internal choice.

B.Sc. Part-III

Paper-I : Plant Morphology And Anatomy

Unit-I

The basic body plan of flowering plant- modular type of growth, diversity of plant form in annuals, biennials and perennials; branching pattern; monopodial and sympodial growth; canopy architecture; meristematic, simple, complex and secretory tissues, tissue systems.

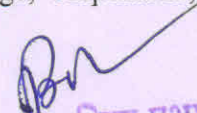
Unit-2

The shoot system: The shoot apical meristem and its histological organization; vascularization of primary shoot in monocotyledons and dicotyledons; cambium and its functions; formation of secondary xylem; a general account of wood structure growth rings; sapwood and heartwood; secondary phloem-structure and function; periderm. Anomalous secondary growth.

Unit-3

The leaf: origin, development, arrangement and diversity in size and shape: Stomata- Structure and types, stomatal index. Vascularisation of leaf-nodal structure and venation; Senescence and abscission.

The root system: Root apical meristem; differentiation of primary and secondary tissues and their functions; structural modification for storage, respiration, reproduction and root microbial interaction.


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Unit_4

Morphology and anatomy of seed (monocotyledons and dicotyledons): Significance of seed-suspended animation, dispersal strategies. Vegetative propagation.

Suggested readings:

- Cutter.F.G. 1969 *Part I cells and tissues* Edward Arnold. London.
- Cutter.E.G. 1971 *Plant Anatomy Experiment and interpretation. part II, Organs educated* Arnold; London
- Esan.K. 1977 *Anatomy of Seed Plants, 2nd edition* John Wiley & Sons, New York
- Fahm.A. 1985 *Plant Anatomy* Pergamon Press Oxford.
- Hartman H.T. and Kestler, D.E. 1976 *Plant Preparation Principles and of India Pvt. Ltd.* New Delhi.
- Manseth.J.D. 1988 *Plant Anatomy, The Benjamin/Cumming Publishing co. Inc.* Mento Park. California, USA

Suggested Laboratory Exercises:


1. Study of any Commonly occurring Plant to understand the body plan and modular type of growth.
2. Life forms exhibited by flowering plants visit to a forest or a garden)
3. L.S. of shoot tip to study the organization of meristem and origin of leaf primordial.
4. Monopodial and Sympodial types of branching in monocots & dicots.
5. Anatomy of Primary and Secondary growth in monocots and dicots using hand out sections of sunflower, maize, cucurbita stem and roots.
6. Anomalous secondary growth in stem, *Salvadora. Bignonia. Bougainvillia. Bouhaenia myctanthes Leptadema, Deacena.*
7. Study of diversity on leaf shape and size Internal structure of leaf-Dorsiventral and isobilateral leaves, study of stomatal types.
8. Examination of seed (monocot and dicots) Structure seed viability test.
9. Specimen study of modifications of plant parts for Negetive reproduction

B.Sc. Part-III

PAPER-II : Ecology and Economic Botany

Unit-I

Plants and Environment: Atmosphere (four distinct zone viz. stratosphere, troposphere, mesosphere, and thermosphere). Adaptation(Morphological, anatomical and physiological responses) of plants to water (Hydrophytes and Xerophytes). Light (global radiation, photosynthetically active radiation. Zonation in water body: littoral, limnetic and profoundal zones; Photoperiodism, heliophytes and sciophytes). Temperature (Raunker's classification of plants: megatherm, mesotherm, microtherm, heikistotherm; themoperiodicity and vernalisation). Soil (soil Profile, development-weathering and maturation). Soil texture, soil types, role of pH, organic matter, soil nutrients interactions among organisms (neutralism, amnsalism, allelopathy), competition, predation, parasitism, proto cooperation, mutualism), Environmental Protection act.


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UNIT-II

Population ecology, Community, Ecosystem and Phytogeography: Community characteristics: stratification, life forms and biological spectrum, frequency density and cover. Ecological succession: types (primary and secondary), mechanism, nivation, migration, ecesis, reaction and climax, xerosere, hydrosere; Ecosystems; Structure- abiotic and biotic components, trophic level, food chain, food web, ecological pyramids, energy flow (Box and Pipe model of Odum). Biogeochemical N₂ cycle & H₂O cycles of carbon and phosphorus, Vegetation types of Rajasthan. Endangered plants of Rajasthan.

UNIT-III

Basic concept of center of origin of cultivated plants. Food plants. Rice, wheat, maize, potato, sugarcane. Vegetables: general account with a note on radish, onion, garlic, cabbage, spinach, cauliflower, cucumber, tomato, lady finger and pea. Fruits: General account with a note on apple, banana, ber, mango, mulberry, jamun, watermelon, muskmelon, guava and orange. Vegetable oil: Ground nut, mustard and coconut.

UNIT-IV

Spices: General account with an emphasis on those cultivated in Rajasthan (Cumin, Capsicum, Coriander). Beverages: Tea and Coffee. Medicinal plants: General account with an emphasis on plant species cultivated in Rajasthan (Senna, Isabgol, Safed musli). Fibres: Cotton and jute. Wood: General account of sources of firewood, timber and bamboos; Rubber. Ethnobotany: A general account.

Practical Exercise:

1. Study frequency and density, abundance plant species of campus vegetation by quadrat method
2. Variation in soil moisture in relation to depth.
3. To estimate bulk density of grassland and woodland soil.
4. To estimate the porosity of grassland and woodland soil sample.
5. To determine moisture content of grassland and woodland soil.
6. To measure dissolved oxygen content in polluted and unpolluted water samples.
7. To measure temperature of different water bodies.
8. Water holding capacity of the soil.
9. Find out pH of soil sample by universal indicator method.
10. Find out pH of water sample by pH meter.
11. Find out transparency of waterbody by sechhidisk
12. Study morphology (external and internally) of hydrophytes (Hydrilla stem, Typha leaf and Nymphaea/Eichhornia petiole and xerophytes (Calotropis, Capparis and Casuarina stem, Nerium leaf with reference to their adaptations.
13. Study following specimen with special reference to:
 1. Botany of the economically important part.
 2. processing, if any involved.
 3. Specimen of cereals, pulses, spices beverage (Tea & coffee) beans, sugar, or seeds (mustard, groundnut)

14. Study of starch grain in potato and pea histochemical test cellulose, lignin, starch Fat, protein and tannin.
15. Submits specimens of locally important medicinal Plants.

B.Sc. Part-III
PAPER-III : Angiosperm - Taxonomy and Embryology

Unit-I

Introduction of Taxonomy, Units of classification, Concept of genus and species, Botanical Nomenclature, International code of Botanical Nomenclature.

Taxonomic Literature: Floras, Gardens, Herbaria, Monographs, Icones, Librery.

Types of systems of classification : Bentham and Hooker's, Engler's, Engler and Prantle's system.

Diversity of flowering plants illustrated by members and economic importance of the following families: Papaveraceae, caryophyllaceae, and Apiaceae, cucurbitaceae.

UNIT-II

Rubiaceae, Apocynaceae, Asclepiadaceae, Convolvulaceae, Acanthaceae, Lamiaceae, Chenopoliaceae, Euphorbiaceae, Liliaceae, Arecaceae.

UNIT-III

Ontogeny of the flower parts-development and variations. Structure of anther, Microsporogenesis, Tapetum-Types and functions, development of male gametophyte, structure of pollen grains.

Types of ovules and Megasporogenesis, development of female gametophyte (Embryosac). Pollination, Pollination types. Fertilization, double fertilization, significance of double fertilization.


UNIT-IV

Development of dicot and monocot embryo. Formation of embryo, Types of Embryo. Endosperm, Types of Endosperm, Endosperm haustoria. Polyembryony, Induced polyembryony, Parthenocarpy. Apomisis and Adventive embryony.

Taxonomy

The following are suitable for study of families.

1. Ranunculaceae: Ranunculus, Delphinium
2. Fabceae: Pisum Sativum,


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