

SEMESTER II**GENERIC ELECTIVE****1 Paper****Total 100 x 1 = 100 Marks****II. GENERIC ELECTIVE (GE 2)**

(Credits: Theory-04, Practicals-02)

Marks : 75 (ESE: 3Hrs) + 25 (Pr 3Hrs)=100**Pass Marks: Th ESE = 30 + Pr ESE =10***Instruction to Question Setter for**End Semester Examination (ESE):*

There will be two group of questions. **Group A is compulsory** and will contain two questions. **Question No.1 will be very short answer type** consisting of ten questions of 1 mark each. **Question No.2 will be short answer type** of 5 marks. **Group B will contain descriptive type** six questions of fifteen marks each, out of which any four are to answer.

Note: There may be subdivisions in each question asked in Theory Examinations.

PLANT ECOLOGY & TAXONOMY**Theory: 60 Lectures****Unit 1: Introduction****(2 lectures)****Unit 2: Ecological factors**

Soil: Origin, formation, composition, soil profile. Water: States of water in the environment, precipitation types. Light and temperature: Variation Optimal and limiting factors; Shelford law of tolerance. Adaptation of hydrophytes and xerophytes

(10 lectures)**Unit 3: Plant communities**

Characters; Ecotone and edge effect; Succession; Processes and types

(6 lectures)**Unit 4: Ecosystem**

Structure; energy flow trophic organisation; Food chains and food webs, Ecological pyramids production and productivity; Biogeochemical cycling; Cycling of carbon, nitrogen and Phosphorous

(8 lectures)**Unit 5: Phytogeography**

Principle biogeographical zones; Endemism

(4 lectures)**Unit 6 Introduction to plant taxonomy**

Identification, Classification, Nomenclature.

(2 lectures)**Unit 7 Identification**

Functions of Herbarium, important herbaria and botanical gardens of the world and India; Documentation: Flora, Keys: single access and multi-access

(4 lectures)**Unit 8 Taxonomic evidences**

Taxonomic evidences from palynology, cytology, phytochemistry and molecular data.

(6 lectures)

Unit 9 Taxonomic hierarchy

Ranks, categories and taxonomic groups

(2 lectures)**Unit 10 Botanical nomenclature**

Principles and rules (ICN); ranks and names; binominal system, typification, author citation, valid publication, rejection of names, principle of priority and its limitations.

(6 lectures)**Unit 11 Classification**

Types of classification-artificial, natural and phylogenetic. Bentham and Hooker (upto series), Engler and Prantl (upto series).

(6 lectures)**Unit 12 Biometrics, numerical taxonomy and cladistics**

Characters; variations; OTUs, character weighting and coding; cluster analysis; phenograms, cladograms (definitions and differences).

(4 lectures)**GE 2 LAB: PLANT ECOLOGY & TAXONOMY****60 Lectures**

1. Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and lux meter.
2. Determination of pH, and analysis of two soil samples for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency by rapid field test.
3. Comparison of bulk density, porosity and rate of infiltration of water in soil of three habitats.
4. (a) Study of morphological adaptations of hydrophytes and xerophytes (four each).
(b) Study of biotic interactions of the following: Stem parasite (*Cuscuta*), Root parasite (*Orobancha*), Epiphytes, Predation (Insectivorous plants)
5. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method. (species to be listed)
6. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distribution law
7. Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification):
Brassicaceae *Brassica, Alyssum / Iberis*; Asteraceae -*Sonchus/Launaea, Vernonia/Ageratum, Eclipta/Tridax*; Solanaceae -*Solanum nigrum, Withania*; Lamiaceae -*Salvia, Ocimum*; Liliaceae -*Asphodelus/ Lilium / Allium*.
8. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label (to be submitted in the record book).

Reference Books

- Kormondy, E.J. (1996). Concepts of Ecology. Prentice Hall, U.S.A. 4th edition.
- Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
- Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA, U.S.A.
- Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.