# RANI CHANNAMMA UNIVERSITY, BELAGAVI

## WEL-COME

**TO THE COURSE STRUCTRE AND SYLLABUS OF UNDERGRADUATE PROGRAMMES – B.Sc**

## V Semester

**w.e.f.**

**Academic Year 2016-17 and onwards**

**B.Sc. V Semester**

**(w.e.f : 2016 – 17)**

**Botany Paper – I**

## Paper-I: Plant Breeding, Tissue Culture and Horticultural Practices. 50 Hrs

**Objectives:** This paper includes some topics in horticulture like- Nursery, Green House Technology, Harvest and Weed Management. These will be of much help to the students residing in rural and urban areas to generate employment.

**Unit 1: Plant Breeding:** History and objectives. Introduction, Selection (Pure line, Mass Selection),

Hybridization- inter specific and inter generic. Mutational & Polyploidy breeding. Germ plasm and its maintenance. Pollen Bank, Quarantine method.

**10 Hrs.**

**Unit 2: Plant Tissue Culture:** Scope and Significance. Basic Aspects and Cellular totipotency (Shoot tip, Embryo and Haploid culture techniques). Differentiation and morphogenesis.

**10 Hrs.**

**Unit 3: Introduction to Horticulture, Nursery management and importance.**

Methods of propagation – vegetative – rhizome, bulb, corm and sucker (natural).

Artificial- Cutting, layering, grafting and budding. Bonsai – methods and importance.

Nursery management:

Introduction, types of nurseries and cultural practices. Seed (propagule) collection, storage and treatment. Manures, fertilizers and pesticides. Methods of irrigation – drip, sprinkler and flood

**12 Hrs.**

**Unit 4: Green House Technology** – Introduction, advantages and limitations.

Types of Green Houses- Green House structure, principle

Green house technology as applied to ornamental, vegetable and fruit plants.

**08 Hrs.**

**Unit 5: Harvest Technology and Weed Management:**

Harvest Technology**:** Flower and fruit plants management. Artificial ripening, maturity indices, methods of picking. Post-harvest technology and management of fruits: grading, processing, storage and packing.

Weed Management: Introduction and significance. Invasive weeds – concept and causes of their dominance. Weed control – physical, chemical and biological methods.

**10 Hrs.**

## Practicals :

1. Study of methods of propagation with help of tubers, bulbs rhizomes, corms suckers, runner and offset.
2. Study of propagation by cutting, layering, grafting and budding.
3. Methods of emasculation and bagging for cross-pollination.
4. Morphology and anatomy of dry and wet stigma.
5. Morphology and anatomy of solid and hollow styles.
6. Study of pollination types.
7. Demonstration of tissue culture techniques.
8. Visit to nursery - poly house /Green house and tissue culture lab.
9. Preparation of MS media for culture.
10. Bonsai techniques.

**Suggested Reading :**


1. Chahal – Principles and procedures of plant breeding – L.B. Publication.
2. Sinha and Sinha – Cytogenetics, Plant Breeding and evolution- Vikas Publication.
3. Joshi P. – Genetic Engineering and its applications- Panima Book Distribution, Bangalore.
4. Purohit, S.S. -Molecular basis of cytoplasmic male sterility in crop plants.
5. Sawahel and Wagley, 1997- Plant Genetic Engineering- daya Publishing House, New Delhi.
6. Vyas S.P. and Kohi, D.V. - Methods in Biotechnology and Bioengineering – Daya Publishing House, New Delhi.
7. Vasil.IK. and Thorpe T.A. 1997- Plant cell and Tissue Culture – Kluwer Academic Publishers, The Netherlands.
8. Bhojwani S.S. 1990- Plant Tissue Culture: Applications and Limitation- Elsevier Science Publishers, New York.
9. Text Book of Horticulture – K. Manibhushan Rao – Macmillan India Ltd.
10. Introduction to Horticulture – N. Kumar (First Edition, Rajlakshmi Publication, 1996)


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## Semester-V

## Botany Practical I

## (Plant Breeding, Tissue Culture & Horticultural Practices.)

**Time: 4 Hours** **Max Marks: 40**

Q.1. Estimate the percentage of pollen viability in the given specimen 'A'

08 Marks

Q.2. Carry out the Emasculation process in specimen 'B' and describe the hybridization technique (show it to the examiner)

08 Marks

Q.3. Demonstrate the vegetative propagation method C, and describe the procedure with diagram (show it to the examiner)

07 Marks

Q.4. Identify & comment D, E, F & G specimens/ slides.

12 Marks

Q.5. Journal 05. Marks

## B.Sc V Semester Practical Examination

## Subject: Botany Paper- I

## Instructions to Examiners.

**Time: 4Hours** **Max Marks: 40**

Q.1. The percentage of pollen viability in the specimen A. **08 marks**

(Preparation- 6 marks, tabulation and inference – 2marks)

Q.2. Emasculation process in Specimen B **08 marks**

(Preparation-4 marks, description-2 marks, oral-2 marks). .

Q.3. Vegetative propagation method C (cutting /Grafting/Layering ) **07 marks**

( Preparation-3 marks, diagram-1mark, description-2 marks ,oral-1mark )

Q.4. Specimens/slides- D, E, F and G **12 marks.**

(one each specimen/slide from pollination, tissue culture, type of stigma, type of style.

Identification-1mark, description -2 marks).

Journal **05 marks**.

## B.Sc. V Semester Theory Examination

## Sub: BOTANY Paper – I

## Pattern of Question Paper

**Time: 03 hours** **Max. Marks: 80**

**All questions are compulsory**

**Q. I Answer any ten out of twelve (01 to 12 sub questions)** **10 X 2 = 20**

**From Unit 1** Plant breeding: 02 sub questions.

**From Unit 2** Plant tissue culture: 02 sub questions.

**From Unit– 3** Introduction to Horticulture, Nursery management and importance-03 sub questions.

**From Unit 4** Green House Technology-02 sub questions.

**From Unit 5** Harvest Technology and Weed Management**:** 03 sub questions

**Q. II Answer any six out of eight (13 to 20 sub questions)** **6X 5 = 30**

**From Unit 1** Plant breeding: 01 sub question.

**From Unit 2** Plant tissue culture: 01 sub question.

**From Unit 3** Introduction to Horticulture, Nursery management and importance-03 sub questions.

**From Unit 4** Green House Technology-01 sub question.

**From Unit 5** Harvest Technology and Weed Management**:** 02sub questions

**Q. III Descriptive Answers.**

**21. From Unit 1** Plant breeding: 01 sub question. **1 X 10 = 10**

**OR**

**From Unit 2** Plant tissue culture: 01 sub question.

**22. From Unit 3** – Introduction to Horticulture, Nursery management and importance -01 sub question.

**1 X 10 = 10**

**OR**

. **From Unit 3** – Introduction to Horticulture, Nursery management and importance-01 sub question.

**23. From Unit 5** Harvest Technology and Weed Management**:** 01sub question. **1 X 10 = 10**

**OR**

**From Unit 5** Harvest Technology and Weed Management**:** 01sub question.

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# Semester V

# (w.e.f 2016-17)

# Botany Paper – II

**Paper-II: Ecology, Environmental Biology and Phytogeography** **50 hrs**

**Objectives:-**This paper has topics on pollution, pollution control and forestry. Considering the present scenario with respect to environment these topics are most valuable.

**Unit 1: Plant and environment:** Atmosphere (gaseous composition), water (properties of water cycle), light (global radiation, photo synthetically active radiation), temperature, soil (development, soil profiles, physico-chemical properties), and biota.

Morphological, anatomical and physiological responses of plants to water (hydrophytes, xerophytes and epiphytes), temperature (thermoperiodicity and vernalization), light (photoperiodism, heliophytes and sciophytes) and salinity.

**12 Hrs.**

**Unit 2: Population ecology and Ecosystems:** Growth curves; ecotypes; ecads, Ecological succession-hydrach and xerarch. Structure of Ecosystems (Pond and Forest): abiotic and biotic components; food chain, food web, ecological pyramids, energy flow.

**10 Hrs.**

**Unit 3: Phytogeography:** Botanical regions of world, Vegetation types of Karnataka and India.

**06 Hrs.**

**Unit 4: Conservation of Natural resources:** Different types of natural resources and their conservation,

Forest and Forest Management: Forest and its ecological significance, deforestation, forest management and social forestry. Natural depletion of vegetation endangered and threatened economic plants of India and red data book. Wild life management in India, Indian board of wild life, national park and sanctuary.

Energy resources: conventional and non conventional sources of energy.

Biodiversity: significance, types, depletion, conservation of biodiversity. **12 Hrs.**

**Unit 5: Pollution:** Introduction, causes, effects and control measures of Water pollution**,** Air pollution, Soil pollution, Acid rain, Global warming, and Ozone depletion.

Sewage water and waste water types. Methods of effluent treatment of industrial waste water, sludge disposal and its care related to environment. **10 Hrs.**

## Practical:

1. Study of frequency and density of herbaceous plants by quadrat method.
2. To determine moisture content and water holding capacity of different types of soils.
3. To estimate the alkalinity of water samples.
4. Ecological instruments.
5. Morphology and anatomical adaptations in three hydrophytes.
6. Morphology and anatomical adaptations in xerophytes: One succulent and one non-succulent, one epiphyte and one halophyte.
7. Waste water analysis, physical chemical parameter, pH, turbidity, TDS, BOD, COD, temperature and any other inorganic elements.
8. Visit to effluent treatment plant to study recycling of waste water near by industry and study the effect of industrial pollution nearby water bodies (Biomagnification & Eutrophication).
9. Assignment of Project related to practical number eight.

10. Study Tour of minimum two days to study forest types and ecological groups.

**Books for Reference:**


1. Sharma P.D. (1993)-Ecology and Environment – Rastogi Publication, New Delhi.
2. Mishra R. - Ecology Work Book- Oxford and IBH, New Delhi.
3. Agarwal K.C. (1993)- Environmental Bilogy- Agro Botanical Publishers, Jodhapur.
4. Mishra K.C. (1992)- Manual of Plant Ecology – Oxford & IBH Publication, New delhi.
5. Kochar P.L. (1980) – Plant Ecology – S. Nagin & Co., Jallandhar.
6. Kormandi E.J. (1984)- concept of Ecology- Printice Hall Ind., New Delhi.
7. Asthana R.K. (1998) – Environmental Problems and Solution- S.Chand & Co. Pvt, Ltd., New Delhi.
8. Verma P.S., V.K. Agarwal (1983) – Environmental Biology - S.Chand & Co. Pvt, Ltd., New Delhi.
9. Subramanyam N.S. A.V.S.S. Samburthy (2000)- Ecology- Narosa Publishing House, New Delhi.
10. Sharma O.P. (1993) – Ecology & Environmental Biology- Rastogi Publication, Meerut.
11. Nebel B.J. (1990) – Environmental Science – Printice Hall Indu. Pvt. Ltd. New Delhi.
12. Trivedi R.K. Etal (1987) – Practical Ecology – Anmol Publication, Jodhapur.
13. Rao K.S. (1971) - Fundamentals of Ecology – W.B. Saunders co. Philadelphia.
14. Shukla R.S. & Chandel P.S. (2000) – Plant Ecology – S.Chand & Co. Pvt. Ltd., New delhi.
15. Odum, E.P 1983. Basic Ecology, Saunders, Philadelphia.

16. Mackenzie,A et al. 1999.Instant Notes in Ecology. Viva Books Pvt.Ltd Delhi.

17. For laboratory exercises

a. Krebs, C.J. 1989. Ecological Methodology. Harper and Row, New York.

b. Ludwig, J.A. and Reynolds, J.F. 1988. Statistical Ecology. Wiley. New York.

c. Moore, P.W. and Chapman, S.B. 1986. Methods in plant Ecology. Blackwell scientific publications.

**Semester-V**

**Botany Practical II**

**(Ecology, Environmental Biology and Phytogeography.)**

**Time: 4 Hours** **Max Marks: 40**

Q.1. Give the external and internal features of ecological adaptations with neat labelled diagrams of specimen- A and mention the habitat to which it belongs. 08 Marks

Q.2. Determine the moisture content & water holding capacity of sample 'B'. 05 Marks

Q.3. Analyse sewage & waste water sample- C (pH, turbidity, TDS,). 06 Marks

Q.4. a. Identify and describe the features of ecological interest in slide D. 03 Marks

b. Describe the use and working mechanism of ecological instrument E. 03 Marks

Submission of Project (Industrial visit) 05 Marks
Submission of Study tour report (Viva voce on Ecology/vegetation types studied during tour & project) 05 Marks

Journal 05 Marks

**B.Sc V Semester Practical Examination**

**Subject: Botany Paper- II**

**Instructions to Examiners.**

**Time: 4Hours** **Max Marks: 40**

Q.1. Ecology specimen -A **08 marks**

(External and internal ecological adaptations- 5 marks, diagram-2 marks, mentioning habitat- 1mark)

Q.2. Moisture content /water holding capacity of sample -B **05 marks**

(Performing experiment and procedure-3 marks, calculation and result-2marks).

Q.3. Analysis of sewage and waste water sample -C. **06 marks**

(PH-2marks, turbidity-2marks, TDS-2marks).

Q.4. a-Ecological slide- D. **03 marks.**

(Identification -1mark, description -2 marks)

b- Ecological instrument-E **03marks**

(Identification-1mark, working mechanism and use -2marks

Submission of project **05 marks.**

Study tour report ( Viva voce) **05 marks.**

Journal **05 marks.**

**B.Sc.V Semester Theory Examination**

**Sub: BOTANY Paper – II**

**Pattern of Question Paper**

**Time: 03 hours** **Max. Marks: 80**

All questions are compulsory

**Q. I Answer any ten out of twelve (01 to 12 sub questions)** 10 X 2 = 20

From Unit 1: Plant and environment- 03 sub questions.

From Unit 2: Population ecology and Ecosystems-04 sub questions.

From Unit 3: Phytogeography-01 sub question.

From Unit 4: Conservation of Natural resources-02 sub questions.

From Unit 5: Pollution-02 sub questions.

Q. II Answer any six out of eight (13 to 20 sub questions) 6X 5 = 30

From Unit 1: Plant and environment- 02 sub questions.

From Unit 2: Population ecology and Ecosystems-02 sub questions.

From Unit 3: Phytogeography-01 sub question.

From Unit 4: Conservation of Natural resources-02 sub questions.

From Unit 5: Pollution-01 sub question.

Q. III Descriptive Answers.

**21.** From Unit 1: Plant and environment- 01 question. 1 X 10 = 10

OR

From Unit 2: Population ecology and Ecosystems-01 question.

**22.** From Unit 3: Phytogeography-01 question.

OR

From Unit 4: Conservation of Natural resources-01 question. 1 X 10 = 10

**23.** From Unit 5: Pollution-01 question. 1 X 10 = 10

OR

Short notes From Unit 1: Plant and environment & From Unit 4: Conservation of Natural resources -01 question each. 2 x 5 = 10

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