



PERIYAR UNIVERSITY

PERIYAR PALKALAI NAGAR

SALEM - 636011

DEGREE OF BACHELOR OF SCIENCE
CHOICE BASED CREDIT SYSTEM

Syllabus for

B. SC. BOTANY

(SEMESTER PATTERN)

**For Candidates admitted in the Colleges affiliated to
Periyar University from 2017 - 2018 onwards)**

REGULATIONS

Objectives of the course:

This course will enable the students

To gain knowledge of the importance of plants in conserving food and fuel.

To acquire skills in drawing by actual observation at its original and natural condition.

To know the nutritive value of food and maintain 'Health and Care Problems'

To create awareness in the understanding of extinct plants.

To create awareness of natural resources and methods of Conservation.

To develop student skills of growing various horticultural plants thereby to raise a nursery.

To train in techniques of Vegetative propagation and gardening.

To motivate for self-employment by knowledge and practicing in the preparation of Mushroom technology.

'Earn while learn' can be done with the acquirement of basic knowledge in growing some medicinal plants.

To gain knowledge for exploration of new plants of unknown value and known plants of unknown value of their secondary metabolites.

To gain a knowledges of the techniques of producing desirable plants through the study of molecular biology and genetic engineering.

SCOPE

This course considers the patterns of plant diversity and the processes that generate and maintain plant diversity. It is an interdisciplinary approach in which major groups of plants are overviewed in holistic manner.

This course also considers the Biology of plants. Different branches of Botany are given due importance as they deserve. Practical's are framed with an aim to improve skills in microcopy, observation, drawing, and laboratory exercise. During field trips the students are exposed to basic ecological principles and interactions.

Students who complete this course will have better understanding on the types and sources of plants by diversity and the role of human and non-human factors in plant diversity. Students will better understanding plants and their importance in Biosphere as life sustaining components.

Students who complete this course can pursue research. As topics from relevant course are included there is a scope for the student to have opportunity in employment in state and central governments. Also the student has a scope for self-employment.

1. ELIGIBILITY

Refer this office circular No: PU/R/AD-1/UG/PG/Programmes Eligibility/2019 Dated: 16-04-2019.

2. DURATION OF THE COURSE

The course for the degree of Bachelor of Science shall consist of three academic years divided into six semesters. Each Semester consists of 90 working days. Practical examinations will be at the end of even semesters

3. FEATURES OF CBCS:

Under Choice Based Credit System (CBCS), a set of papers consisting of Core papers, Elective papers, Skill based elective papers and Non -major elective papers are offered. Beside the Core Papers, which are totally related to the major subject, the students have the advantage of studying supportive papers and non -major papers. This provides enough opportunity to the students to learn not only the major subject but also inter disciplinary and application oriented subjects.

4. CREDITS:

In CBCS, each paper is assigned with a certain number of Credits depending upon the workload of the students. The total Credits to be earned by a student to qualify for the degree is 140. The credit of the paper is fixed by giving due weightage to the syllabus content and contact hours per week.

PASSING MINIMUM

THEORY

University Examination (EA) 75 Marks

Internal Assessment (CIA) 25 Marks

Classification of Internal Assessment Structure

Marks

Internal Assessment

| | | |
|---------------------------|---|-----------------|
| Test | - | 15 Marks |
| Assignment | - | 5 Marks |
| Attendance | - | 5 Marks |
| Total | - | 25 Marks |
| <hr/> | | |
| Passing Minimum (CIA) 40% | - | 10 Marks |
| Passing Minimum (UE) 40% | - | 30 Marks |
| Total | - | 40 Marks |

PRACTICAL

University Examination (EA) 60 Marks

Internal Assessment (CIA) 40 Marks

Classification of Internal Assessment Structure

Marks

| | | |
|---|---|-----------------|
| Submission | - | 10 Marks |
| Test | - | 10 Marks |
| Attendance | - | 5 Marks |
| Continues assessment in Practical class | - | 10 Marks |
| Total | - | 40 Marks |
| <hr/> | | |
| Passing Minimum (CIA) 40% | - | 16 Marks |
| Passing Minimum (EA) 40% | - | 24 Marks |
| Total | - | 40 Marks |

The candidate shall be declared to have passed the examination if the candidates secure not less than 30 marks out of 75 marks in the University examination in each theory paper and 10 marks out of 25 marks in the Internal Assessment and in total not less than 40 marks.

For the practical paper 24 marks out of 60 marks in the University examination and the record notebook taken together and 16 marks out of 40 marks in the Internal Assessment and in total 40 marks. There is no passing minimum for the record notebook. However submission of a record notebook is a must

CLASSIFICATION OF SUCCESSFUL CANDIDATES

Candidates who secure not less than 60% of the aggregate marks in the whole Examination shall be declared to have passed the examination in First class.

All other successful candidates shall be declared to have passed in the Second class.

Candidates who obtain 75% of the marks in the aggregate shall be deemed to have passed the examination in First Class with Distinction provided they pass all the examinations prescribed for the course at the first appearance.

Other successful candidates who secure below 50% shall be declared to have passed the examination in Third class

Candidates who pass all the examinations prescribed for the course in the first instance and within a period of two academic years from the year of admission to the course only are eligible for University Ranking

7. MAXIMUM DURATION FOR THE COMPLETION OF THE UG PROGRAMME

The maximum duration for completion of the UG Programme shall not exceed twelve semesters.

COMMENCEMENT OF THIS REGULATION

These regulations shall take effect from the academic year 2017-18, i.e., for students who are to be admitted to the first year of the course during the academic year 2017-2018 and thereafter.

TRANSITORY PROVISION

Candidates who were admitted to the UG Course of study before 2017-18 shall be permitted to appear for the examinations under those regulations for a period of three years i.e., up to and inclusive of the examination of **April / May 2021**. Thereafter, they will be permitted to appear for the examination only under the regulations then in force.

Course Structure (CBCS)

B.Sc BOTANY COURSE STRUCTURE FROM THE YEAR 2021-2022 ONWARDS

| Sem | Part | Course | IntHrs | Credit | Exam Hrs | Marks | | | |
|-----|-------|---|--------|---|--|-------|-----|-------|--|
| | | | | | | CIA | EA | Total | |
| I | | | | | | | | | |
| | I | Language paper I | 6 | 3 | 3 | 25 | 75 | 100 | |
| | II | Communicative English paper I | 6 | 3 | 3 | 25 | 75 | 100 | |
| | | Professional English I | 6 | 4 | 3 | 25 | 75 | 100 | |
| | III | Core Course I (Plant Diversity I) | 5 | 5 | 3 | 25 | 75 | 100 | |
| | | Core Course II (Major Practical I) | 3 | (Practical Assessment and credit carried to II sem Core Course II) | | | | | |
| | | First Allied -I | 4 | 3 | 3 | 25 | 75 | 100 | |
| | | First Allied –I Practical | 3 | Practical Assessment and credit carried to II sem Allied Course II | | | | | |
| | IV | Environmental Studies | 1 | | | | | | |
| | IV | Value Education | 2 | 2 | 3 | 25 | 75 | 100 | |
| | TOTAL | 36 | 20 | | | | 600 | | |
| II | I | Language paper II | 6 | 3 | 3 | 25 | 75 | 100 | |
| | II | Communicative English paper II | 6 | 3 | 3 | 25 | 75 | 100 | |
| | | Professional English II | 6 | 4 | 3 | 25 | 75 | 100 | |
| | III | Core Course III (Plant Diversity II) | 5 | 3 | 3 | 25 | 75 | 100 | |
| | III | Core course II (Major Practical I) | 3 | 3 | 3 | 40 | 60 | 100 | |
| | III | First Allied -III | 4 | 4 | 3 | 25 | 75 | 100 | |
| | III | First allied –I (Practical) | 3 | 3 | 3 | 40 | 60 | 100 | |
| | IV | Environmental Studies | 1 | 2 | 3 | 25 | 75 | 100 | |
| | IV | SBEC I Mushroom Technology | 2 | 2 | 3 | 25 | 75 | 100 | |
| | | 36 | 27 | | | | 800 | | |
| III | I | Language paper III | 6 | 3 | 3 | 25 | 75 | 100 | |
| | II | Communicative English -III | 6 | 3 | 3 | 25 | 75 | 100 | |
| | III | Core course –IV (Anatomy and Embryology of Angiosperms) | 4 | 4 | 3 | 25 | 75 | 100 | |
| | III | Core course V (Major Practical II) | 3 | 3 | (Practical Assessment and credit carried to IV Sem Core Course V) | | | | |
| | III | Second Allied –I | 4 | 4 | 3 | 25 | 75 | 100 | |
| | III | Second Allied practical II | 3 | (Practical Assessment and credit carried to IV Sem Second allied II) | | | | | |
| | IV | SBEC –II (Horticulture) | 2 | 2 | 3 | 25 | 75 | 100 | |
| | IV | NMEC-I (Mushroom Culture) | 2 | 2 | 3 | 25 | 75 | 100 | |
| | | | 21 | | | | 600 | | |
| IV | I | Language paper IV | 6 | 3 | 3 | 25 | 75 | 100 | |
| | II | Communicative English -IV | 6 | 3 | 3 | 25 | 75 | 100 | |
| | III | Core course –VI (Plant Diversity III) | 4 | 4 | 3 | 25 | 75 | 100 | |
| | III | Core course V (Major Practical II) | 3 | 3 | 3 | 25 | 75 | 100 | |
| | III | Second Allied –II | 4 | 4 | 3 | 25 | 75 | 100 | |
| | III | Second Allied Practical II | 3 | 3 | 3 | 40 | 60 | 100 | |
| | IV | SBEC –III (Plant Tissue Culture) | 2 | 2 | 3 | 25 | 75 | 100 | |
| | IV | NMEC-II Herbal Botany | 2 | 2 | 3 | 25 | 75 | 100 | |
| | TOTAL | 30 | 24 | | | | 800 | | |
| V | III | Core course VII (Morphology &Taxonomy of Angiosperms) | 5 | 5 | 3 | 25 | 75 | 100 | |

| | | | | | | | | |
|----|-----|--|-----|--|---|----|----|------|
| | III | Core course VIII (Cytology and Genetics) | 5 | 5 | 3 | 25 | 75 | 100 |
| | III | Core course IX (Bio Instrumentation and Bio Statistics) | 5 | 5 | 3 | 25 | 75 | 100 |
| | III | Core course X (Major Practical III)(Core course VII, VII& IX) | 3+3 | (Practical Assessment and credit carried to VI Sem Core Course X) | | | | |
| | III | Major Elective course I (Plant Biotechnology) | 5 | 5 | 3 | 25 | 75 | 100 |
| | IV | SBEC-IV – (Agricultural Microbiology) | 2 | 2 | 3 | 25 | 75 | 100 |
| | IV | SBEC-V-(Plant Breeding &Plant utilization as food) | 2 | 2 | 3 | 25 | 75 | 100 |
| | | TOTAL | 30 | 24 | | | | 600 |
| VI | III | Core course XII (Plant Physiology) | 5 | 5 | 3 | 25 | 75 | 100 |
| | III | Core course XIII (Plant Ecology and Plant Geography) | 5 | 5 | 3 | 25 | 75 | 100 |
| | III | Core course XIV (Plant Protection) | 5 | 5 | 3 | 25 | 75 | 100 |
| | III | Core course X (Major Practical III)(Core course VII, VII& IX) | | 4 | 3 | 40 | 60 | 100 |
| | III | Core course XI (Major Practical IV) (Core course X, XI & XII) | 3+3 | 4 | 4 | 40 | 60 | 100 |
| | III | Major elective course (Biochemistry) | 5 | 5 | 3 | 25 | 75 | 100 |
| | IV | NMSDC VI- Medical coding | 2 | 2 | 3 | 25 | 75 | 100 |
| | IV | SBCE VII- Seed Technology | 2 | 2 | 3 | 25 | 75 | 100 |
| | IV | Extension Activities | | 1 | | | | |
| | | TOTAL | 30 | 32 | | | | 800 |
| | | GRAND TOTAL | | 148 | | | | 4200 |

B. Sc. BOTONY

SEMESTER -I

CORE – I ALGAE PLANT DIVERSITY –I

(ALGAE & BRYOPHYTES)

UNIT -I

15 Hrs.

General characteristics and classification (F.E. Fritsch). Habit and habitats of freshwater, marine and soil algae. Pigmentation and Reserve food in algae. Economic importance of Algae – Agar-Agar, Carrageenan, Single cell protein(SCP)- *Chlorellin*, Algae in sewage Disposal , Algae as Food and Fodder , Diatomite.

UNIT- II

15 Hrs.

A detailed study of Structure, Reproduction and life cycle of the following algae genera: *Oscillatoria*, *Anabaena*, *chlamydomonas* , *Volvox* and *Oedogonium*

UNIT- III

15Hrs

A detailed study of Structure, Reproduction and life cycle of the following algae genera - *Caulerpa*, *Chara*, *Cyclotella*, *Sargassum* and *Polysiphonia*

BRYOPHYTES

UNIT -IV

15Hrs

Bryophytes - General characteristics, Occurrence, Distribution and classification (Rothmaler, 1951)
A detailed study of the Structure, Reproduction and life cycles of the following genera – *Marchantia*

UNIT -V

15Hrs

A detailed study of the Structure, Reproduction and life cycles of the following genera *Porella*, *Anthoceros* and *Polytrichum*). Economic Importance of Bryophytes.

PRACTICAL

3 Hrs. /Week

Micro preparation and detailed microscopic analysis of vegetative and reproductive parts of the following Algae - *Oscillatoria*, *Anabaena*, *Chlamydomonas*, *Volvox*, *Oedogonium*, *Caulerpa*, *Chara*, *Cyclotella*, *Sargassum* and *Polysiphonia*

Micro preparation and detailed microscopic analysis of vegetative and reproductive parts the following Bryophytes – *Marchantia*, *Porella* , *Anthoceros* and *Polytrichum*3. Study the Economic importance of Algae (Spotter - Agar-Agar, Carrageenan, SCP (*Spirulina*) - *Chlorellin*, Gelling agent (*Ulva*), Fodder (*Sargassum*) - Diatomite.

ALGAE Text Book

Sharma, O.P (2011). Algae, Tata McGraw Hill Education Private limited, New Delhi.

Vashishta, BR, Sinha AK, and SinghVP (2011). Botany For Degree Students Algae, S. Chand. Pub. New Delhi

Pandey, BP (1994). Algae.S. Chand & Company Ltd. New Delhi.

Kumar, HD (1999). Introductory Phycology. 2ndedition. Affiliated East-West. Press Pvt. Ltd. Delhi.

5. Annie R, Kumaresan V, Arumugam N (2014). Saras Publication; 1 Edition, Nagercoil, Tamilnadu

Reference books:

Bold, HC & Wynne, MJ (1985). Introduction to the Algae. Prentice Hall of India, New Delhi.

Fritsch, FE (1945). Structure and reproduction of Algae. Cambridge University press.

Round, FE.(1984). The Ecology of Algae. Cambridge University Press.

Lee, RD (2008). Phycology 4th Edition, Cambridge University Press, New York

BRYOPHYTES Text Books

Sharma, OP (2013). Bryophytes , McGraw Hill education (India) Pvt.Ltd, New Delhi

Parihar, NS (1991). An introduction to Embryophyta. Vol. I. Bryophyta. Central Book Depot, Allahabad.

Vashishta, PC (1999). Bryophyta, S.Chand & Company, New Delhi.

Vashishta, Sinha AK (2011). Bryophytes, S.Chand & Company ltd., New Delhi

Reference Books

Rashid, A (1998). An Introduction to Bryophyta, Vikas Pub.Ltd, Newdelhi

Prem Puri (1981). Bryophytes: Morphology, Growth and differentiation. Atma Ram and Sons, New Delhi.

Cavers, F (1971). The interrelationship of Bryophyta, Dawsons of Pall Mall, London.

Smith, AJE (1982). Bryophyte Ecology. Chapman and Hall. London

Watson EV (1968). British Mosses and Liverworts, Hutchinson and Co., London.l

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SEMESTER –II

CORE – III - PLANT DIVERSITY –II

(FUNGI, LICHENS, BACTREIA AND VIRUSES) FUNGI

UNIT- I

15 Hrs.

A study of the general characteristics and mode of life of fungi: vegetative organization, nutrition, asexual reproduction, sexual reproduction, Heterothallism and Parasexuality and life cycles in Fungi - Haplontic, Diplontic and haplodiplontic. Classification of fungi (C.J. Alexopoulos and Mims, 1979). Economic importance of Fungi.

UNIT -II

15 Hrs.

Detailed study of occurrence, Morphology, Reproduction, Life cycle and Economic importance of the following genera: *Albugo*, *Saccharomyces*, *Aspergillus*, *Neurospora*, *Peziza*,

UNIT -III

15Hrs

Detailed study of Occurrence, Morphology, Reproduction, Life cycle and Economic importance of the following genera: *Puccinia*, *Polyporus* and *Cercospora*

LICHENS AND VIRUSES

UNIT- IV

15Hrs

Lichens: General characteristics, Occurrence, Distribution, Classification, Reproduction and Economic importance of Lichens. Detailed study of *Usnea*

Viruses: General characters of Plant viruses – General account of Bacteriophages – Cyanophages, Mycophages. Mycoplasma (PPLO) – Reproduction of T4 phage

BACTERIA

UNIT -V

15Hrs

Bacteria – Major characteristics, Occurrence and Distribution, Classification. Morphology of Bacterial cell – Ultra structure of Bacterial cell – Cell wall. Mode of nutrition in bacteria – Photosynthetic and chemosynthetic. Growth – Reproduction in Bacteria – Economic importance of bacteria.

PRACTICAL :

3hrs /Week

Micro preparation and Detailed microscopic analysis of Vegetative and Reproductive Parts of the following Fungi- *Albugo*, *Saccharomyces*, *Aspergillus*, *Neurospora*, *Peziza*, *Puccinia*, *Polyporus* and *Cercospora*.

2. Micro preparation and detailed microscopic analysis of vegetative and Reproductive Parts of the *Usnea*.
3. Study of viruses using electron micrographs (photographs).
4. Study of Structure of Bacteria using permanent slides / photographs.

FUNGI Textbooks

- Sharma, OP (2011). Fungi and allied microbes The McGraw –Hill companies, New Delhi
- Alexopoulos, CJ. Mims, CW (1979). Introductory Mycology, Wiley Eastern Ltd., New Delhi
- Dube, HC. (1990). An Introduction of Fungi. Vikas Publication House Ltd, New Delhi
- Dube, HC (1983). Introduction of Modern Mycology. Blackwell Science Publication. Oxford
- Sharma, PD (2003).The Fungi. Rastogi Publications, Meerut

Reference book

- Burnett, J.H. (1971).The fundamentals of Mycology. ELBS Publication, London
- Bessey, E.A (1979). Morphology and Taxonomy of fungi, Vikas publishing House Pvt. Ltd, New Delhi.
- Mehrotra, RS, Aneja KR (1990).An Introduction to Mycology , New Age International Pub, New Delhi
- Sundararajan, S. (2004). Practical manual of fungi , Anmol publications Pvt.ltd New Delhi
- Webster,J (1970) introduction to fungi , Cambridge university press ,London

LICHENS

Reference Books

- Muthukumar, S. and Tarar, JL (2006).Lichen Flora of Central India, Eastern book Corporation , New Delhi.
- Dharani Dhar Awasthi (2000). A Handbook of Lichens Vedams eBooks (P) Ltd. New Delhi
- Hale, ME. (1983). The Biology of Lichens. Edward Arnold, London
- Nash TH (1996). Lichen Biology. Cambridge University Press, London

BACTERIA Text books

- Sharma ,PD. (1992). Microbiology , Rastogi & Co., Meerut
- Tauro, P, Kapoor, KK, Yadav KS (1996). An Introduction to Microbiology, New age International (P) Ltd.Pub. New Delhi.

Pelzer, MJ, Chan, ECS and Krieg, NR .(1983). Microbiology , Tata MaGraw Hill Publishing House , New Delhi

Power and Dagainwala .(1994). General Microbiology , Himalayan publishing House, New Delhi

Reference Books

Stainer,RY, Adelberg,EA and Ingram, JL (1978). General Microbiology, Mac Millan & Co, London.

VIRUSES Text Books

Biswas,SB, Biswas, A(1997). An introduction to viruses (4th Edition .Vikas .pub.House . Pvt. Ltd, New Delhi

Reference Books

Cooper, JJ (1995). Viruses and the environment (2nd edition) Chapman & Hall, London

Nayudu MV(2008) . Plant viruses, Tata McGraw-Bill Education, New Delhi

Mandahar CI (1987). Introduction to plant viruses, S. Chand & Company Pvt. Ltd., New Delhi.

B. Sc. BOTONY

SEMSETRE- II

SKILLED BASED ELECTIVE COURSE – I

MUSHROOM CULTURE TECHNOLOGY

UNIT - I

6 Hrs.

Introduction - history - scope of edible mushroom cultivation - Types of edible mushrooms available in India - temperate mushroom, sub-tropical mushroom and tropical mushroom. Detail study of *Pleurotus citrinopileatus*, *Agaricus bisporus*.

UNIT -II

6 Hrs.

Pure culture - preparation of medium (PDA and Oatmeal agar medium) sterilization - preparation of test tube slants to store mother culture – culturing of *Pleurotus* mycelium on Petri plates, preparation of mother spawn in saline bottle and polypropylene bag and their multiplication.

UNIT -III

6 Hrs

Cultivation Technology : Infrastructure: substrates (locally available) Polythene bag, vessels, Inoculation hood, inoculation loop, low cost stove, sieves, culture rack, mushroom unit (Thatched house), water sprayer, tray, small polythene bag. Mushroom bed preparation - paddy straw, sugarcane trash. Factors affecting the mushroom bed preparation - Low cost technology.

UNIT -IV

6 Hrs.

Storage and nutrition: Short-term storage (Refrigeration - upto 24 hours) Long term Storage (canning, pickles, papads), drying, storage in salt solutions. Nutrition - Proteins - amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content - Vitamins. Medicinal values of mushrooms

UNIT- V

6 Hrs.

Food Preparation: Types of foods prepared from mushroom; Soup, Cutlet, Omelets, Samosa, Pickles, Curry. Value added products of mushroom. – mushroom soup powder, mushroom biscuit, mushroom nuggets, mushroom ketchup, candy, murabba, chips etc,. Research Centers - National level and Regional level. Cost benefit ratio - Marketing in India and abroad, Export Value.

References:

Marimuthu, T, Krishnamoorthy, AS, Sivaprakasam, K. and Jayarajan. R (1991). Oyster Mushrooms, Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.

Swaminathan, M. (1990) Food and Nutrition. Bappco, The Bangalore Printing and Publishing Co. Ltd., Bangalore.

Tewari, Pankaj Kapoor, S.C., (1988). Mushroom cultivation, Mittal Publications, Delhi.

Nita Bahl (1984-1988) Hand book of Mushrooms, II Edition, Vol. I & Vol. II.

Manjit singh, Bhuvnesh vijay, Shwet kamal, GC Wakchaure (Eds.) (2011).

Mushrooms - cultivation, marketing and consumption. Directorate of Mushroom research, ICAR, Chambaghat, Solan , HP-173213.

B. Sc. BOTONY

SEMESTER –III

CORE – IV - ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS ANATOMY

UNIT – I

10 Hrs.

Meristems: Classification, distribution, structure and function. Shoot apex and Root apex organization. Theories: Histogen, Tunica – Corpus and quiescent center. Simple permanent tissues: Parenchyma, Collenchyma, Sclerenchyma. (Fibers and Sclereids)

UNIT – II

15 Hrs.

Complex tissues: Xylem – Tracheids, Vessels, Xylem fibres and Xylem parenchyma. Secondary Xylem, Annual rings, Heart wood and Sap wood, Tyloses. Phloem: Sieve elements, companion cells, phloem fibre and phloem parenchyma. Secondary phloem. Stomatal types: Anomocytic, Anisocytic, Paracytic, Diacytic and Graminaceous. Trichomes- Types.

UNIT – III

15 Hrs.

Primary and secondary structure of Dicot Stem & Root. Anomalous secondary growth in stems of *Bignonia*, *Nyctanthes*, *Dracaena*. Primary structure of monocot stem and root. Structure of Dicot and Monocot leaf. Nodal anatomy – Uni, tri and multilacunar node.

EMBRYOLOGY OF ANGIOSPERMS

UNIT – IV

10 Hrs.

Structure and development of Anther. Development of male gametophyte. Types of ovules. Nucellus. Development of Female gametophyte: Monosporic (*Polygonum*).

UNIT – V

10 Hrs.

A brief account on pollination, Fertilization, Double fertilization and Triple fusion.

Endosperm: Nuclear, Cellular, Helobial and Ruminant. Endosperm haustoria. Development of Embryo in Dicot (*Capsella-bursa pastoris*). Polyembryony.

PRACTICALS

ANATOMY OF ANGIOSPERMS

Study of simple and complex tissues by using permanent slides.

Study of primary structure and sectioning of Dicot stem, root, leaf, Monocot stem, root and leaf.

Normal secondary thickening in Dicot stem and root.

Anomalous secondary structures – *Bignonia*, *Nyctanthes*, *Dracaena*.(Permanent slides)

Stomatal types: Anomocytic, Anisocytic, Paracytic, Diacytic and Gramineous. (Peel out From leaf).

EMBRYOLOGY OF ANGIOSPERMS

Structure of Anther (Young and Mature from *Datura* or *Cassia* flower)

Types of ovules: Anatropous, Orthotropous, Circinotropous, Amphitropous, Campylotropous.
(Permanent slides).

Stages in Microsporogenesis and Megasporogenesis (Permanent slides onion flower Bud).

Structure of Male gametophyte and Female gametophyte (Permanent Slides/photographs).

Dissection of embryo and observe the globular and Heart shape

Structure of Endosperm. Nuclear (Coconut water) cellular endosperm (Cucumber seed) Ruminant
(fruit of *Arecha catechu*)

ANATOMY

Text Book

Pandey B,P., (2015)(Edn.) Plant Anatomy S. Chand Publ. New delhi.

Vashista P.C (1984). *Plant Anatomy* –Pradeep publication , Jalandhar

Pijushroy,(2010).Plant Anatomy, New central Book Agency ,Pvt Lit, New Delhi.

Reference Book

Cutter, E.G. (1970). *Plant Anatomy: Experimental and interpretation*. Edward, Arnold Pub. Ltd., London.

Cutter, E.G. (1971). *Plant Anatomy*, Edward Arnold Pub. Ltd., London.

Cutter, E.G. (1978). *Plant Anatomy, Experimental and Interpretation*. Edward Arnold Pub.Ltd., London

Esau, K.(1960). *Plant Anatomy*, Wiley Eastern Private Ltd., New Delhi.

Esau, K.(1977). *Anatomy of seed plants*. Wiley Eastern Publication, New Delhi.

Fahn, A.(1989). *Plant Anatomy*. Macmillan Publication (P) Ltd, Singapore

Coutler E.G (1969) *Plant Anatomy-Part I Cells and Tissues* –Edward Arnold London

EMBRYOLOGY Text Book

Bhatnagar, SP, Dantu P.K, Bhojwani SS (2014) The Embryology of Angiosperms 6th edition Vikas Publishing House. Delhi

Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms, 5th Edition, Vikas Publishing House. Delhi.

Pandey , AK (2000). Introduction to Embryology of Angiosperms 1st Edition :CBS; New Delhi

Maheswari, P.(1976). An introduction to the Embryology of Angiosperms.TATA McGraw-Hill Publishing Co., Ltd., New Delhi.

Reference book

Johri, B.M. I (1984). Embryology of Angiosperms, Springer-Verlag

Shivanna, K.R. (2003). Pollen Biology and Biotechnology. Oxford and IBH Publishing Co. Pvt. Ltd. Delhi.

Swamy ,B.G.L and Krishnamurthy ,K.V From flower to fruit .Tata McGraw Hill Co. Pvt. Ltd, New Delhi

Davis, G.L. (1966). Systematic Embryology of the Angiosperms.

Dwivedi, J.N. (1988). Embryology of Angiosperms. Rastogi & Co., Meerut.

Rahavan, V. (1976). Experimental Embryogenesis in Vascular plants, Academic Press, London.

B. Sc. BOTONY**SEMESTER –III****SKILLED BASED ELECTIVE COURSE – II****HORTICULTURE****UNIT - I****6Hrs**

Fundamentals of Horticulture: Definition, Branches, Importance and Scope. Classification of Horticultural Crops- fruits and vegetables. Gardening: Definition, objectives and scope - different types of gardening.-Formal, informal and kitchen garden

UNIT - II**6Hrs**

Plant propagation: Cutting, layering, Budding and grafting. Selection and significant of Stock and scion. Role of plant growth regulator in Horticulture: Induction of Rooting, flowering, Fruit set, Fruit development.

UNIT - III**6Hrs**

Soil bed preparation, Potting, Repotting, Weeding, Pruning, Topiary. Lawn making: Types of lawn grasses, maintenance of lawn. Hedge plant and its importance.

UNIT - IV**6Hrs**

FLORICULTURE: Importance and Scope of Floriculture. Commercial Floriculture: Production and packaging of cut flowers; Flower arrangements; Methods to prolong vase life; Cultivation of Important cut flowers (Chrysanthemum, Jasmine, Rose).Ikebana.

UNIT - V

Ornamental gardens: Flowering annuals; Herbaceous, perennials; Divine vines; Shade and ornamental trees; Ornamental bulbous and foliage plants; Cacti and succulents; Palms. Ornamental garden: Green House, Water garden, Rockery, Bonsai techniques.

HORTICULTURE Text Book

- Kumar, N., (1997). Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
2. Edmond Musser & Andres (1994) Fundamentals of Horticulture, McGraw Hill Book Co., New Delhi.
- Manibhushan Rao, K. Text book of Horticulture. Macmillan India Ltd.4. Chadha K.L.(2003). Hand book of Horticulture, ICAR publication , New delhi.

Reference books

Randhava, GS (1973). Ornamental horticulture in India. Today and Tomorrow Printers and Publishers, New Delhi.

Williams, CN., Uzo, JO , Peregrine, WTH (1991). Vegetable production in Tropics. Longman Scientific & Technical, Essex (UK).

Yawalkar, KS (1961). Vegetable crops of India. Agri-Horticultural Publishing House, Dharmapath, Nagpur.

B. Sc. BOTONY**SEMSETRE- III****NON – MAJOR ELECTIVE COURSE –I****MUSHROOM CULTIVATION****UNIT - I****6Hrs**

Introduction, History. Nutritional and medicinal value of edible mushrooms; Poisonous mushrooms. Types of edible mushrooms available in India - *Pleurotus citrinopileatus*, *Agaricus bisporus*

UNIT - II**6Hrs**

Pure culture: Preparation of Medium (Potato dextrose and Oatmeal Agar medium), Sterilization – culturing of *Pleurotus* mycelium on test tube Slants, Petri plate -Preparation of mother spawn in saline bottle and poly propylene bag –substrate for spawn preparation(cereal grain, coir pith)

UNIT - III**6 Hrs**

Cultivation Technology : Infrastructure: substrates (locally available) Polythene bag, vessels, Inoculation hook, inoculation loop, low cost stove, sieves, culture rack, mushroom unit (Thatched house) water sprayer, tray, small polythene bag. Mushroom bed preparation - paddy straw, sugarcane trash, maize straw, banana leaves. Factors affecting the mushroom bed preparation - Low cost technology.

UNIT - IV**6 Hrs**

Storage and nutrition: Short-term storage (Refrigeration - upto 24 hours) Long term Storage (canning, pickles, papads), drying, storage in salt solutions. Nutrition - Proteins -amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content – Vitamins.

UNIT - V**6 Hrs**

Food Preparation: Types of foods prepared from mushroom. Research Centres - National level and Regional level. Cost benefit ratio - Marketing in India and abroad, Export Value.

Reference Books

Marimuthu, T. Krishnamoorthy, A.S. Sivaprakasam, K. and Jayarajan. R (1991) Oyster Mushrooms, Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.

Swaminathan, M. (1990) Food and Nutrition. Bappco, The Bangalore Printing and Publishing Co. Ltd., Bangalore .

Tewari, Pankaj Kapoor, S.C., (1988). Mushroom cultivation, Mittal Publications, Delhi.

Nita bahl 2009. Hand book on Mushrooms. Oxford & IBH Publishers New Delhi

Tripathi.D.P 2005. Mushroom Cultivation. Oxford & IBH Publishers New Delhi

Muthusamy. A.D & Yesuraja.I 1999. Mushrooms Culture. TNAU Publishers New Delhi.

B. Sc. BOTONY**SEMESTER –IV****CORE – VI - PLANT DIVERSITY- III****(PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY)****PTERIDOPHYTES****UNIT - I****15Hrs**

Pteridophytes: General characteristics, classification (Reimers 1954). Sporangial organization – Homospory, Heterospory and seed habit, Apospory and Apogamy. Stelar evolution. Ecological and economical importance of Pteridophytes.

UNIT - II**10Hrs**

Morphology, Anatomy, Reproduction and life cycle of *Lycopodium*, *Selaginella*, *Equisetum*

UNIT - III**10 Hrs**

Morphology, Anatomy, Reproduction and life cycle of *Gleichenia*, *Adiantum* and *Marsilea*.

UNIT - IV**10 Hrs****GYMNOSPERMS**

Gymnosperms - General Characteristics, Classification (Pilger and Melchior, 1954). Morphology, Anatomy and reproduction of *Cycas* and *Pinus*. Economical importance.

UNIT - V**5 Hrs**

GYMNOSPERM AND PALEOBOTANY: Detailed study of the *Gnetum*.

Paleobotany – geological time scale, Radiocarbon dating, Fossilization process. Types of fossils. Brief study of the following fossils- *Lepidodendron*, *Lepidocarpon*, *Calamites*, *Williamsonia*

PRACTICAL**3Hrs /Week**

Study of the Habit, TS of leaf and Stem, Morphology of Reproductive structures of Following Pteridophytes. *Lycopodium*, *Selaginella*, *Equisetum*, *Gleichenia*, *Adiantum* and *Marsilea*

Study of the Habit, TS of leaf and stem, Morphology of Reproductive structures of following gymnosperm genera *Cycas*, *Pinus* and *Gnetum*

Study the following fossil members, *Lepidodendron*, *Lepidocarpon*, *Calamites*, *Williamsonia* through permeant slides

PTERIDOPHYTES

Text books

- Vashishta , P.C , Sinha and Anilkumar (2010). Pteridophytes, S.Chand &company Ltd, New Delhi
- Sharma, O.P. (2012). Textbook of Pteridophyta, TATA MacMillan India Ltd., New Delhi
- Smith,G.M (1955). Cryptogamic Botany Vol. II, Tata Mcgraw Hill Publishing Co., Ltd., New Delhi.
- Rasheed, A. (1999). An Introduction to Pteridophyta, Vikas Publishing Co., NewDelhi.
- Vashishta.P.C .(1990). Pteridophyta , S.Chand & Co. Ltd, New Delhi
- Johri, R.M. Sneh Lata and Sandhya Sharma, (2004). A Textbook of Pteridophyta. Vedams Books (P) Ltd., New Delhi

Reference books

- Eames, A.J.(1936). Morphology of Vascular Plants - Lower groups, Tata Mcgraw Hill Publishing company Ltd., New Delhi.
- Sporne,K.R. (1972) . The Morphology of Pteridophytes, B.I. Publications, Madras
- Sporne, KR. (1970). The morphology of Pteridophytes (The structure of Ferns and Allied Plants) Hutchinson University, London.
- Bower. F O (1939) . The Ferns (Vol. I,II,III), Today & tomorrow's Printers, New Delhi

GYMNOSPERMS Text books

- Sharma, OP (2015). Gymnosperms, Pragati Prakashan, Meerut, India
- Bhatnagar and Moitra, (1996). Gymnosperms. New age International Publishers, New Delhi.
- Johri , RM, Lata S , Tyagi K (2005), A text book of Gymnosperms , Dominate pub and Distributer, New Delhi
- Biswas, C. and Johri, B.M. (2004). The Gymnosperms. Narosa Publishing House, New Delhi.
- Vashista P.C. (1990) . Gymnosperms, S. Chand & Co. Ltd., New Delhi

Reference books

1. Bierhost, D.W. (1971). Morphology of Vascular plants. McMillan Company, New York.

Chamberlain, C.J. (1934). *Gymnosperms: Structure and Evolution*. Chicago Reprinted 1950) New York.

Delveloryas, T. (1962). *Morphology and evolution of fossil plants*.

Doyle, W.T. (1970). *Non Vascular Plants: Form and function*. Belmont, California.

Foster and Gifford, Jr., (1962). *Comparative Morphology of Vascular Plants*. Allied Pacific Pvt. Ltd., Bombay.

PALEOBOTANY Reference Books

Atchlay W.R & Woodnuff DS. (1981). *Evolution and speciation*, Cambridge University Press, Cambridge.

Kimura, M. (1983). *The natural theory of molecular evolution*, Cambridge University Press, Cambridge.

Arora M.P. (1990). *Evolutionary biology*, Himalaya Publication House, Delhi.

Kirkaldy, J.E. (1963). *The study of Fossils*. Hutchinson Educational, London

B. Sc. BOTONY

SEMESTER –IV

SKILLED BASED ELECTIVE COURSE -III

PLANT TISSUE CULTURE

UNIT - I

6 Hrs

Introduction to Plant Tissue culture - Historical background, Principle – Totipotency - differentiation – dedifferentiation and re-differentiation; vascular differentiations.

Laboratory organization, Tools and techniques, methods of sterilization. Laboratory contaminants - its control and measures.

UNIT - II

6 Hrs

Media and Culture Preparation: Role of Micro and Macro nutrients, Vitamins, Hormones and carbon source in tissue culture, Media preparation- pH, Temperature, Solidifying agents,. M.S. Media preparations. Maintenance of cultures, Environmental Conditions, Explants selection.

UNIT - III

6 Hrs

Types of culture - Cell, tissue and organ culture – Callus induction, subculture and maintenance. Isolation of single cells, selection and types of cells. Cell suspension cultures - Batch, continuous. Synchronization of suspension culture.

UNIT - IV

6 Hrs

Protoplast : Isolation, Culture and Fusion, Somatic hybridization and Cybridization. Organogenesis - Anther culture and production of haploids - Somatic embryogenesis Synthetic seed production - Cryopreservation.

UNIT - V

6Hrs

Application of tissues and Cell culture – Micropropagation – Clonal propagation – Production of genetically variable plants – Resistance to herbicides, insecticides, virus and other diseases. Production of secondary metabolites – Gene conservation bank.

Text Book

Dubey, R.C., (2001). A text book of biotechnology. S. Chand & Co., New Delhi.

Gupta, P.K. (1994). Elements of Biotechnology. Rastogi Publications, Meerut.

Ignacimuthu, S.J.(2003). Plant Biotechnology. Oxford & IBH Publishing, New Delhi.

John Jothi Prakash, E. (2005). Outlines of Plant Biotechnology. Emkay Publishers, New Delhi.

Kalyankumar De (2008). Plant tissue culture. New Central Book Agency, Calcutta.

Sathyanarayana BN and Vergheese DB (200). Plant tissue culture - Practices and new experimental protocols, ILK Publ. New Delhi.

Reference Books

Bhojwani, SS. and Razdan, MK. (2004). Plant Tissue Culture, Read Elsevier India Pvt. Ltd.

Purohit SS (2010). Plant tissue culture, Student edition, Jodhpur

Dix, PJ (1990). Plant cell line and selection. VCH Publ.

Islam, AS (1996). Plant tissue culture. Oxford & IBH Publ.

Hammond, J.C. McGarvey and V. Yusibov, (2009). Plant Biotechnology, Springer Verlag. New York.

B. Sc. BOTONY

SEMESTER –IV

NON –MAJOR ELECTIVE COURSE–II

HERBAL BOTANY

UNIT - I

6 Hrs.

Herbal medicines: History and scope – Indian system of medicines – Siddha, Ayurvedha and Unani systems. Classification of Crude drugs

UNIT - II

6 Hrs.

Organized drugs –Drugs obtained from Wood – *Ephedra* . Drugs obtained from Barks – *Cinchona* . Drugs obtained from Roots and Rhizomes – *Catheranthus* , *Rauwolfia* and *Ginger*.

UNIT- III

6 Hrs.

Drugs obtained from leaves - *Aloe vera*, *Gymnema sylvestre*, *Ocimum sanctum*. Drugs Obtained from Flower - *Syzygium aromaticum*. Drugs from fruits - *Coriandrum sativum* . Drugs from Seed - *Strychnos nux vomica*. Plants and Herbs – *Bacopa monnieri*, *Andrographis paniculata*

UNIT - IV

6 Hrs.

Pharmacological action of plant drugs-action on the autonomic nervous system, central nervous system(*Mucuna pruriens*, *Withania somnifera*). Heart muscle, Blood vessels (*Terminalia arjuna*, *Azadirachta indica*),. Gastro-intestinal tract (*Curcuma longa*, *Foeniculum vulgare*)

UNIT - VI

6 Hrs.

Collection of crude drugs-Harvesting of crude drugs-Drying of crude drugs (Natural drying and artificial drying)-Garbling- packing of crude drugs-Storage of crude drug. Marketing. Drug adulteration.

Text books

John Jothi Prakash, E. (2003). Medicinal Botany and Pharmacognosy. JPR Publication, Vallioor, Tirunelveli.

Gokhale, SB., Kokate, CK. and Purohit, AP (1995). Pharmacognosy. Nirali Prakashan, Pune.

Prajapathi, Purohit, Sharma and Kumar. (2003). A Hand book of Medicinal plants. Agrobios Publications, Jodhpur.

Kumar,NC (1993). An Introduction to Medical Botany and Pharmacognosy

Chopra, RN, Nayar S.L and Chopra,I.C (1956). Glossary of Indian medicinal plants, C.S.I.R, New Delhi.

Reference Book

Kanny, Lall, Dey and Raj Bahadur, (1984). The indigenous drugs of India, International Book Distributors.

Sivarajan V.V and Balachandran Indra (1994). Ayurvedic drugs and their plant source. Oxford IBH Publishing Co.

Wallis,T.E (2005) Text Book of Pharmacognosy by CBS Pub. Delhi.

Kirthikar and Basu.(2012) Indian Medicinal Plants

Mohammed Ali, (2008–Vol-1). Pharmacognosyby CBS Publishers and Distributors

Ashutosh Kar, (2007). Pharmacognosy and Pharmaco Biotechnology - New Age. Publisher New Delhi.

B. Sc. BOTONY

SEMESTER – V

CORE – VII - MORPHOLOGY AND TAXONOMY OF ANGIOSPERMS

UNIT - I

10 Hrs

The plant body (Parts). Root types and Modification. Stem – Types Aerial and underground Stem modification. Leaf Morphology – Types, Venation, Phyllotaxy

UNIT - II

15Hrs.

Inflorescence: Racemose types - Cymose types - Special type. Morphology of flower- Flower as modified-shoot-detailed structure of flowers-floral parts-their arrangement, Relative position symmetry, Aestivation and placentation types- Floral Diagram and Floral Formula. Fruits: Types and classification

UNIT - III

15Hrs.

Aim, Scope and Significance of taxonomy, System of Classification- Artificial (Linnaeus), Natural system (Bentham and Hooker) and Phylogenetic (Engler and Prantl), Angiosperm Phylogeny Group system 2009 (APGIII) (Introduction only). Only outline of Classification with merits and Demerits need be indicated

Plant nomenclature - Binomial, ICBN/ICN – Principles -Rule of priority and author citation. Types concept. Herbarium technique- Preparation of herbarium, their preservation. Important ; herbaria, Flora and uses.

UNIT - IV

20 Hrs.

Detailed study of families: Study the following families of Bentham and Hooker's System with special reference to their morphological and floral characters. Special attention should be given to common and economically important plants within the families, Annonaceae, Capparidaceae, Rutaceae, Leguminosae (Mimosaceae, Caesalpinaceae and Fabaceae), Myrtaceae, Cucurbitaceae, Apiaceae,

UNIT - V

20 Hrs.

Detailed study of families : Study the following families of Bentham and Hooker's System with special reference to their morphological and floral characters. Special attention should be given to common and economically important plants within the families: Apocyanaceae, Asclepiadaceae, Verbenaceae , Lamiaceae, Euphorbiaceae, Orchidaceae, Liliaceae, Poaceae.

PRACTICAL

3hrs / Week

Describe the plant parts with suitable plants- Technical term habit, habitat form, types of leaves, with leaf shape, margin, texture, modification of leaf.

Study the Types and modification of root and stem with suitable example Identify the following inflorescence and fruits:

Inflorescence - Simple raceme, Spike, Corymb, Head, simple cyme, Cyathium and Hypanthodium.

Fruits - Simple: Berry, Drupe, Pepo, hesperidium. (Indehiscent) – Nut. Dry- Legume, capsule (loculicidal). Aggregate

Floral formula from floral description.

Identify the families mentioned in the syllabus by noting their vegetative and floral Characters.

Students must describe the floral parts, draw the L.S., floral diagram and write the floral formula of at least one flower from each family

Study the products of plants mentioned in the syllabus of economic botany with Special reference to the morphology, botanical name and family.

Prepare herbarium of 20 plants with field notes (internal assessment).

Conduct field trips for a minimum of 3 to 5 days under the guidance of a teacher and Submit field report.

Text Book

Lawrence, GHM. (1995). The Taxonomy of vascular Plants (Vol I-IV) ,Central Book, Dept., Allahabad

Heywood VH. (1967). Plant Taxonomy, Edward Arnold , London

Jeffery C. (1982). An introduction to Plant Taxonomy, J& A Churchill Ltd., London

Mathew, K.M. (1983). The Flora of Tamil Nadu Carnatic, The Rapinat Herbarium, Trichy

Sivaraajan ,V.V.(1989). Introduction to Principle of Plant Taxonomy, Oxford and IBH, New Delhi.

Pandey, B.P.(1997).Taxonomy of Angiosperms , S.Chand & Co., New Delhi.

Singh, V. & Jain, K.K. (1989). Taxonomy of Angiosperms – Rastogi, Meerut

Vashista, P.C. (1990). Taxonomy of Angiosperms – S.Chand & Co., New Delhi

9 . Sharma, O.P. (1996). Plant Taxonomy. TATA McGraw Hill, New Delhi

Gurcharan Singh () Plants Systematics 3 edition

Reference books

Hutchinson, J. (1973). The Families of Floweing plants , Oxford University press, London

- Gamble, J.S., Fisher, L.E.F. (1967). The Flora of The presidency of madras (Vol-III) BSI, Calcutta
- Davis, P.H and Heywood, V.M. (1965). Principles of Angiosperm Taxonomy, Oliver and Boyd Edinburgh
- Simpson M.G.(2006). Plant systematics, Elsevier Academic Press, USA
- Takhtajan, A.L. (1969). Flowering Plants – Origin and dispersal – Oliver & Boyd
- Gangulee H.C., Das, K.S and Datta C.T (1964) college Botany –Vol I, basant Panchami, Calcutta
- Narayanaswamy R.V and Rao, K.N (1976). Outline of botany. S. Viswanthan printer and publisher, Chennai
- Heywood V.H. 1967. Plant Taxonomy. London: Edward Arnold.
- Hill A.F. 1982. Economic Botany.: Mc Graw Hill, New York.
- Jain S.K. and Rao R.R. 1976. A hand book of field and herbarium technique. Today and tomorrow's Publishers, New Delhi.
- Jeffery C. (1968) An Introduction to Plant Taxonomy, J and A Churchill. London.
- Naik V.N. (1984) Taxonomy of angiosperms. Tata Mc Graw- Hill Publishing Company, New Delhi.
- Sambamurthy A..S.S. 2005; Taxonomy of Angiosperms, I.K. International Pvt. Ltd, New Delhi.

B. Sc. BOTONY**SEMESTER –V****CORE – VIII - CYTOLOGY AND GENETICS CYTOLOGY****UNIT - I****15 Hrs.**

History and Development of cell biology – Ultra structure of a Plant cell, Cell wall, Plasma membrane. Cell organelles – Endoplasmic reticulum, Golgi complex, Chloroplast, Mitochondria, Nucleus, Lysosome and Ribosomes. Cellular inclusions - Starch grains, Aleurone grains, Inulin Crystals, Raphides and Cystoliths.

UNIT - II**15 Hrs.**

Chromosomes – Morphology, Structure of Polytene, Lampbrush and B-Chromosomes.

Nucleic acid – Structure and types of DNA and RNA, Nucleosomes. Replication - DNA. RNA Structure and types. Cell division – Amitosis, mitosis and meiosis.

Gene regulation – Lac operon.

GENETICS**UNIT - III****15 Hrs**

Mendelian genetics – Mendel's laws of inheritance –Monohybrid, Dihybrid Cross. Incomplete dominance and Complementary interaction of genes, Epistasis and lethal alleles. Multiple alleles- general account : ABO blood group in man.

UNIT - IV**15 Hrs**

Linkage and crossing over, Cytological basis of crossing over, mapping of genes on chromosomes, Sex linkage in *Drosophila*(Eye color) and Humans (color blindness). Cytoplasmic inheritance (Plastid inheritance- , Mitochondria- male sterility in maize)

UNIT - V**15Hrs**

Sex determination in plants. Mutations. Chromosome aberrations- deficiencies, duplications, inversions, translocations. Polyploid types- aneuploids, euploids and allopolyploids. Population genetics- Hardy – Weinberg principle.

PRACTICAL

3hrs / week

To observe the plant cell structure with onion epidermal peel out.

Study of the photomicrographs of cell organelles

Microscopic view of cell organelles in plant cells – Chloroplast (Hydrilla leaf)

Starch grains (Potato), Aleurone grains (wheat), Inulin Crystals (potato), Raphides (Petiole – Colocasia /Nymphaea) and Cystoliths –(leaf peel out -Ficus/Momordica).

Study the polytene and lamp brush chromosome structure through photograph

Identification of different stages of mitosis by using squash and smear techniques –Onion Root tip.

Simple problems of monohybrid and Dihybrid ratios and factor interaction

Construction of chromosome map – three point test cross

Text Book

Rastogi, SC (1992) .Cell biology , Tata McGrew-Hill,New Delhi

Sundararajan ,S (2000). Cytology , Anmol publication (P) ltd, New Delhi

Gupta, PK.(2002).Genetics.Rastogi publishers,Meerut

Meyyan RP (2000) genetics , Saras Publication ,Nagercoil

Reference book

Strickberger,M.W(1999).Genetics.Prentice Hall of India Pvt Ltd.New Delhi

Singh.B.D (2000).Fundamentals of Genetics.Kalyani Publishers, NewDelhi

Mirra,S (1994).Genetics- A Blue print of life.Tata McGraw Hill, New Delhi

Dyansager,V.R (1986.Cytology and Genetics.Tata McGrew-Hill,New Delhi.

Karp,G (1995)Cell and Molecular Biology,John Wiley and Sons,New York

Lewin (2007). Gene IX. Jones and Barlett Pub. ISBN. O 7637 5222 3

Brown,T.A.(2006). Genomes 3, Garland science, New Yark.

B. Sc. BOTONY**SEMESTER –V****CORE IX - BIOINSTRUMENTATION AND BIOSTATICTIS****UNIT - I****15 Hrs**

Basic principles of Light microscopes – Compound microscope, Phase contrast microscope, Scanning and Transmission Electron microscopes. Micrometry - Principle and Applications of Stage and Ocular micrometer. Haemocytometer.

UNIT - II**15 Hrs**

Micro technique – preparation for microscopic observation – Whole mount, Smears, Squash, sections.

Microtomy: Fixation, Dehydration, Infiltration, Embedding, Sectioning.

Microtome's – Types- Principles and operating mechanisms of Rotary Microtome.

Stains and Staining techniques - Preparation of following stains: Safranin, Cotton blue in lactophenol, Acetocarmine, Methylene blue and Crystal violet.

UNIT - III**15 Hrs**

Centrifugation: Principles, components, mechanism and application of clinical, Refrigerated and ultra-centrifuges. Chromatography: Basic principles, types – Paper, Column, Thin layer. Electrophoresis (SDS –PAGE). Blotting techniques – Southern, Northern and Western Blotting.

UNIT - IV**15 Hrs**

Principle and Application of Colorimetry and Spectrophotometer. Basic principles of pH meter and its operation, types of Electrodes, Measurement of pH.

UNIT - V**15 Hrs**

Biostatistics – Statistics data, population, samples, parameters; Representation of Data: Tabular, Graphical; Measures of central tendency: Arithmetic mean, mode, median; Measures of dispersion: Range, mean, Standard deviation, Variation.

PRACTICAL**3hr / Week**

Parts of microscope and its operation

Measurement of Microscopic objects using Micrometer

Demonstrate the counting of Spore /Miro algae by using Haemocytometer

Familiarize stains, fixatives and mounting media

Demonstrate the Preparation of specimen and sectioning using microtome

Chromatography –Separation of pigments - TLC,

Demonstration of the working of different kinds of centrifuges

Determination of the concentration of a sample solution using colorimeter/ Spectrophotometer

Measure the pH in different water sample using pH meter

Study of blotting techniques: Southern, Northern and Western, through photographs.

Work out the problems related to mean, median, mode, standard deviation.

Text Book

Patki L.R, Bhalchandra B.L, Jeevaji I.H.(1987). An introduction to Microtechnique, S.Chand and company (Pvt)ltd, New Delhi

Marimuthu, R. (2008). Microscopy and Microtechnique. MJP Publishers,Chennai

3. Wilson K, Walker, J. (1994). Principle and techniques of practical biochemistry,4th ed) Cambridge university press, Cambridge

Palanivelu P (2013). Analytical Biochemistry and Separation techniques , 20th century publications ,Palkalai nage ,Madurai

Khan, I.A., and Khannum, A., (1994).Fundamentals of Biostatistics, Vikas Pub., Hyderabad

Sundar Rao P.S.S and Richard J(2011) introduction to Biostatistics and research methods , PHI learning private Ltd., New delhi

References Books

Johansen, DA (1940). Plant Microtechnique, TATA McGraw Hill Book Co., Ins., New Delhi.

Peter Gray (1964). Hand book of Basic Microtechnique. McGraw hill publication ,New York

Cooper.TG (1991).The Tools of Bio - chemistry, John Wiley & sons, London

Dey P.M. and Harborne, JB (2000). Plant Biochemistry Harcourt Asia Pvt. Ltd.

Plummer DT (2003).An introduction to practical Biochemistry. 3rd Edn. Tata McGraw Hill Publishing Company Ltd. New Delhi

Zar, JH (1984). Biostatistics Analysis, Prentice Hall International, England Cliffs, New Jersey.

B. Sc. BOTONY**SEMESTER –V****MAJOR ELECTIVE COURES- I****PLANT BIOTECHNOLOGY****UNIT - I****15Hrs.**

Biotechnology – History, definition, scope, significance. Recombinant DNA technology – Enzymes . Cloning vectors – Plasmid, Cosmids, Bacteriophages, Phasmids, BAC, YAC, Shuttle vector. Transposons, Applications of Genetic Engineering.

UNIT - II**15 Hrs.**

Gene transfer in plants-Aims, strategies for development of transgenic plants-Direct gene transfer methods- Biolistics – Electrophoration ,lipofection , Microinjection. Vector mediated gene transfer in higher plants – *Agrobacterium* mediated gene transfer – T DNA , Ti Plasmid and Ri plasmid derived vector system

UNIT - III**15 Hrs.**

Techniques and application of biotechnology – Polymerase chain reaction- Principle, Enzymes, types - Real time PCR and Application –DNA Sequencing – Sanger's method . Molecular f analysis of gene – molecular marker – RAPD –RFLP – brief account DNA finger printing and Bar coding of plants

UNIT - IV**15 Hrs.**

Genes of agronomic interest and transgenic crops: Golden rice, Bt cotton and Bt brinjal Terminator seed technology- antisense RNA (flavr savr) and RNAi technology – Disease resistance ,herbicide resistance enhancement of shelf life of flowers and fruits. Medical biotechnology – Insulin, Monoclonal antibodies and Hybridoma techniques.

UNIT - V**15Hrs.**

Environmental Biotechnology : Biodiversity and conversation . Waste management - Solid waste – wastewater, Biogas, Bioremediation. Industrial biotechnology – Bioethanol, pharmaceutical product. Food biotechnology –SCP . Improved food and food products

TEXT BOOKS :

Kumaresan, V(2009) .Biotechnology”, Saras Publications, Nagercoil,

Dubey, RC (2004)A text book of Biotechnology”3rd Edition , S.Chand & Company Ltd, New Delhi.

- Gupta, PK.(2004).Elements of Biotechnology”,I st edition Rastogi publications – Meerut
4. Purohit, SS.(2005), Biotechnology Fundamentals & Applications” 3rd Edition. Mrs. Saraswathi Purohit for student Edition, India.
- Razdan, MK (2008) Introduction to plant tissue culture” ,2nd edition Oxford & IBH publishing Co. Pvt. Ltd., New Delhi.

Reference Book

- Brown TA (2006) gene cloning and DNA analysis ; Blackwell scientific publishers
- Prime rose SB, Twyman RM & old RW (2001) .principle of gene manipulation; an Introduction to genetic engineering. 6th Ed Blackwell oxford
- Wilson K & walker J (2008) principle and techniques of Biochemistry an dmolecular Biology . Cambridge university Press.
- Smith JE(2005) Biotechnology , Cambridge university press, UK.

B. Sc. BOTONY**SEMESTER –V****SKILL BASED ELECTIVE COURSE -IV****AGRICULTURAL MICROBIOLOGY****UNIT - I****6Hrs**

General characterization – Soil microflora- Bacteria, fungi, Actinomycetes, Algae, Phosphate solubilizing bacteria . Rhizosphere and non rhizosphere concept. Role of Rhizosphere microorganisms in soil fertility.

UNIT - II**6Hrs**

Nitrogen cycle in nature- biological N₂ fixation. Symbiotic and non-symbiotic bacteria. *Rhizobium* and *Azospirillum* - Isolation, Mass Production and Field application.

UNIT - III**6Hrs**

Azotobacter - Isolation, Mass production and Field application. Cyanobacteria (blue green algae), *Azolla* and *Anabaena azollae* association, nitrogen fixation, factors affecting growth, Blue green algae and *Azolla* in rice cultivation

UNIT - IV**6Hrs**

Mycorrhizal association, types of mycorrhizal association, taxonomy, occurrence and distribution, phosphorus nutrition, growth and yield – colonization of AM – isolation and inoculum production of AM, and its influence on growth and yield of crop plants.

UNIT - V**6Hrs**

Organic farming- green manuring and organic fertilizers, recycling of biodegradable municipal, agricultural and industrial wastes- Biocompost making methods, types and method of vermicomposting- field application.

Reference Book

Dubey, RC (2005).Text book of Biotechnology S.Chand & Co, New Delhi.

Kumaresan, V(2005). Biotechnology, Saras Publications, New Delhi.

John Jothi Prakash, E (2004) .Outlines of Plant Biotechnology. Emkay Publication, New Delhi.

Sathe, TV (2004) Vermiculture and Organic Farming. Daya publishers.

Subha Rao, NS (2000). Soil Microbiology, Oxford & IBH Publishers, New Delhi.

Vayas,SC, Vayas, S. and Modi, HA (1998) Bio-fertilizers and organic Farming Akta Prakashan, Nadiad.

B. Sc. BOTONY

SEMESTER V

SKILL BASED ELECTIVE COURSE – V

PLANT BREEDING AND PLANT UTILIZATION AS FOOD PLANT BREEDING

UNIT - I

6Hrs

Plant Breeding: Historical aspect of plant breeding , Objectives of plant breeding. Breeding Methods: Plant introduction - Types and procedures - Centers of diversity and origin of cultivated plants. Acclimatization .Selection methods, (pure line, clonal and mass)

UNIT - II

6 Hrs.

Hybridization: Types and procedure of hybridization. Heterosis, Hybrid vigour. Somatic hybridization. Anther culture and its Role in plant breeding. Role of mutation and polyploidy in plant breeding.

PLANT UTILIZATION AS FOOD.

UNIT - III

6Hrs

Cereals: A list of major cereals and millets, nutritive value of cereals. *Oryza*-origin, Distribution, botany, method of cultivation, uses, improved varieties, rice conversion, nutritional value.

Pulses: Major pulse crops of our country, nutritive value of pulses. Origin, distribution, Botany, ecology, cultivation, uses of Red gram.

UNIT - IV

6 Hrs

Sugar Crop: A list of common sugar yielding plants. Sugarcane: Origin, distribution, botany, ecology, cultivation, extraction of juice, uses, by-products of sugar industry, improved varieties.

Oil Crop: Classification of vegetable fatty oils and its uses, important fatty oil yielding plants. Groundnut: Origin, Botany of the plant, pod structure, ecology, cultivation, important varieties, oil extraction, uses.

UNIT - V

6 Hrs

Fruit Crops: General properties and nutritive value of fruits. Origin, Distribution, Ecology, Botany and uses of Papaya.

Vegetables: Types, the importance of vegetables in human diets. Origin, distribution, Ecology and uses of Onion.

Text Books

- Chauduri, HK. (1971).Elementary Principles of Plant Breeding, Oxford and IBH Co., New Delhi.
- Hill, A. (adapted by O.P. Sharma) (1976) Economic Botany, Tata McGraw Hill Publishing Co., Ltd., New Delhi.
- Govind Prakash and Sharma, S.K. (1979).Introductory Economic Botany, Jai Prakash Nath& Co., Meerut.
- Pandey, BP(1980) Economic Botany, S.Chand and Co., New Delhi.
- Singh, SP, Lakshmi Ram Singh, Srivastava, JP. (1999). Plant Breeding, Aman Publishing House, Meerut.
- Singh, BD (2002).Plant Breeding, Kalyani Publishers, Ludhiana.
- Gupta, SK(2010) practical plant breeding, Second edition, Agrobios (India) ,Jodhpur

Reference Books

- Allard, R.W. 1960, Principles of Plant Breeding. John Willey and Sons, Inc.
- Kachroo, P.1970, Pulse Crops of India. I.C.A.R. New Delhi.
- Sambamurthy, A.V.S.S. and Subrahmanyam, N.S. 1989. A Text Book of Economic Botany, Wiley Eastern Ltd., New Delhi.
- Choudhury, B. 1992. Vegetables. National Book Trust, New Delhi.
- Ranjit Singh, 1992. Fruits. National Book Trust. New Delhi.
- Wealth of India (Vol. 1-10), 1992. CSIR, New Delhi.

B. Sc. BOTONY

SEMESTER –VI

CORE – XI - PLANT PHYSIOLOGY

UNIT - I

15 Hrs

Plant water relations- Diffusion, imbibition, osmosis, OP, DPD, TP, WP. Absorption of water and Mineral – Active absorption and passive absorption. Ascent of sap. Transpiration – types, mechanism of stomatal movement. Factors affecting transpiration. Guttation. Role of macro and microelements.

UNIT - II

15 Hrs

Photosynthesis- Photosynthetic pigments - Concept of photosynthetic unit – Emerson's enhancement effect – Stages of photosynthesis – light reactions – cyclic and non-cyclic photophosphorylation. Calvin cycle. C4 and CAM pathway. Photorespiration (Brief study only). Factors affecting photosynthesis.

UNIT - III

15 Hrs

Respiration – Aerobic and Anaerobic respiration. Glycolysis, Krebs cycle, Electron transport System. Oxidative phosphorylation. Factors affecting respiration.

UNIT - IV

15 Hrs

Nitrogen Metabolism: nitrogen fixation- nitrification and denitrification. Nitrate assimilation- Synthesis of amino acids - Reductive amination and Transamination. Stress physiology – Definition - water stress, salt.

UNIT - V

15 Hrs

Plant Growth regulators – Types of plant hormones – Auxins, Gibberellins. Cytokinins Abscisic acid, Ethylene. Photomorphogenesis - Phytochrome – photoperiodism. Vernalization. Senescence. Plant movements.

PRACTICAL 3Hrs /Week

Determination of DPD by using Rheo leaf /Onion leaf

Effect of temperature on Membrane permeability

Effect of chemical on Membrane permeability

Calculation of stomatal index and stomatal frequency of mesophyte and Xerophyte plant leaf

Effect of light on transpiration using Ganong's potometer

Separation of plant pigments by paper chromatography.

To study the effect of light intensity on Photosynthesis by using Wilmotts bubbler

To study the effect of and concentration of CO₂ on Photosynthesis by using Wilmotts bubbler

Measurement of rate of respiration in germinating seed using Simple Respiroscope

Measurement of rate of respiration in flower buds using Simple Respiroscope

Text Books

Pandey, SN and Sinha, BK (2001). Plant Physiology. Third revised edition, Vikas publishing House Pvt. Ltd, New Delhi

Devlin, RM (1974). Plant Physiology, Affiliated East West Press Pvt. Ltd

Noggle, GR. and Fritz, GJ (1976). Introductory Plant Physiology, Prentice-Hall, India.

Jain ,VK (2007).Fundamentals of plant physiology , S. Chand & Company Ltd, New Delhi.

Nobel, PS (1970). Introduction to Biophysical Plant Physiology. W. H. Freeman and Company, San Francisco

Verma,V(2008).Text book of plant Physiology, Ane's student edition, Newdelhi

Bajracharya, D., (1999). Experiments in Plant Physiology- A Laboratory Manual. Narosa Publishing House, New Delhi.

Reference books

Beevers, L (1976). Nitrogen metabolism in plants. William & Sons Ltd. London.

Bray, CM (1983). Nitrogen Metabolism in Plants, Longman.

Kramer, PJ (1969).Plant and soil water relationship, A ModernSynthesis.

Salisbury, F B and Ross, CW (1986). Plant Physiology. Third edition, CBS Publishers and Distributors, New Delhi

Levitt (1972). Responses of plants to environmental stress, Academic press, New York.

Bidwell RGS (1979). Plant Physiology, Mac Millan Publishing Company. New Delhi.

Taiz, L and Zeiger, E (1991) .Plant physiology. The Benjamin/Cummings Publishing company, Inc., California, New York.

B. Sc. BOTONY

SEMSEMESTER –VI

CORE – XII - PLANT ECOLOGY AND PLANT GEOGRAPHY

UNIT - I

15 Hrs

Approaches to the study of ecology- autecology and synecology. Plant environment: climatic, edaphic and biotic factors

UNIT - II

15 Hrs

Ecosystem concept: Ecosystem components (Abiotic and Biotic) –Autotrophs, Heterotrophs. Ecosystem function: Ecological pyramids. Productivity of ecosystem -Primary Productivity – Gross primary productivity -Net primary productivity-Net productivity- Secondary productivity. Food chain. Food web. Biogeochemical cycling; Cycling of carbon, nitrogen and Phosphorous. Pond ecosystem

UNIT - III

15 Hrs

Succession – Types of Succession. Process of Succession -Nudation - migration -Ecesis aggregation - competition -Reaction –climax. Hydrarch and Xerarch succession. Ecological group of plants – Hydrophytes , Mesophytes, Xerophytes, parasites, epiphytes and halophytes

UNIT - IV

15 Hrs

Environmental pollution- introduction, definition; Air pollution- air pollutants, types, sources, effect of air pollution on plants and humans, control measures; Water pollution-water pollutants, types, sources, impact. Control measures. Water quality standards–BOD, Eutrophication; Soil Pollution- causes, sources, solid waste, biodegradable, non- biodegradable, waste dumps, municipal waste, Agrochemicals management of solid waste, Composting, e – waste.

UNIT - V

15 Hrs

Definition, concept, Scope and significance of phytogeography. Phytogeographical zones of India. Vegetational types in Tamil nadu. Hotspots – Endemic distribution, Age and Area Hypothesis. Continental drift theory. Conservation – *In situ* and *Ex situ*.

PRACTICALS

3 Hrs / Week

Study of the morphological and structural adaptation of locally available hydrophytes, Mesophytes, xerophytes to correlate to the particular habitat.

Determination of Dissolved oxygen in water

The light and dark bottle experiment for primary productivity study in the aquatic Ecosystem

Determination of dissolved carbon di oxide in water

Study the vegetation types and distribution with maps

Text Books

Sharma, P.D (2009). Ecology and Environment, Rastogi Publications.

Shukla, R.S. &P.S. Chandel (1991) : Plant Ecology & Soil Science S.Chand & Co., New Delhi

Vasishta, P.C, 1979 Plant Ecology, Vishal Publication.

Verma, V,A 1981 Text Book of plant Ecology, Emkay Publication.

Sharma, J.P.2004 Environmental Studies, Laxmi Publications (P) Ltd. New Delhi.

Reference Books

Ambasht R.S., 1978 The Book of Plant Ecology, Students friends Co.

Willings W.D.1964 Plants and Ecosystem, Wasworti Publishing Co.

Daubenmire R.F,1973 Plant and Environment. John Willey.

Gopal, B and Bhardwaj,1979 Elements of Ecology, Vikas Publishing House Pvt. Ltd.

Cain, S.A . (1944). Foundations of Plant Geography Harper & Brothers, N.Y.

Mani, M.S (1974) : Ecology &Biogeography of India Dr. W. Junk Publishers,he Haque

Good, R. (1997) : The Geography of flowering Plants (2ndEdn.) Longmans, Green & Co., Inc., London & Allied Science Publishers, New Delhi-495pp.,

B. Sc. BOTONY

SEMESTER –VI

CORE – XIII - PLANT PROTECTION

UNIT - I

15 Hrs

Types of insects causing damage to crop. Nature and classification of plant nematodes. Damage to crops of India by Insects, Nematodes, Rodents, Fungi, Bacteria and viruses- a general outline.

UNIT - II

15 Hrs

Types of plant diseases and causal agents. A general account of preventive measures of plant diseases including plant protection and quarantine measures. Legislations in plant protection, seed certification, weed control.

UNIT - III

15 Hrs

Study of symptoms, etiology and control measures of the following diseases: damping off of seedling, bud rot of coconut, black rust of wheat, blast of paddy, smut of maize, Tikka disease of groundnut.

UNIT - IV

15 Hrs

Characteristic features of plant pathogenic bacteria. General symptoms of bacterial disease. survival and spread of bacterial plant pathogens. Insect transmission of bacteria. Study of symptoms, etiology and control measures of the following diseases: Soft rot of Vegetables, Bacterial blight of rice, canker disease of citrus, ring rot of potato.

UNIT - V

15 Hrs

Nature of Plant Virus. Transmission of plant viruses. Causal organism, symptoms, control measures of Viral diseases: Tobacco Mosaic, Bunchy top of banana, Mosaic disease of Lady's finger.

PRACTICAL

Collection and study of diseased plant materials.

Study of fungal, bacterial and viral diseases mentioned in the syllabus.

Handling of plant protection appliances (Dusters, sprayers, and other appliances.)

Preparation of 5 herbarium sheets of Pathology – specimens studied

Text Books

Chaudhury and Majid, (1954).Hand Book of plant protection Department of Agriculture, Government press, Shillong, Assam.

Agros, GN (1997) Plant Pathology (4th ed) Academic Press.

Bilgrami KH. and Dube HC (1976). A textbook of Modern Plant Pathology. International Book Distributing Co. Lucknow.

Mehrotra, RS (1980). Plant Pathology – TMH, New Delhi.

Pandey, BP. (1999). Plant Pathology. Pathogen and Plant diseases. Chand & Co. New Delhi.

Rangaswami, G (1999). Disease of Crop plants of India Prentice Hall of India Pvt. Ltd.

Sharma PD(2004). Plant Pathology Rastogi Publishers

Reference

Robbins, W Crafts, S, Raynor, N (1952). Weed control McGraw Hill Book Company Inc., New York.

Pyenson, L.L (1951). Elements of plant protection. John Wiley and Sons Ltd., Inco, New York.

Bap Reddy D, (1968)Plant protection in India, Allied publishers

Walker, JC (1957).Plant pathology Me Graw Hill Publishers.

Mandahar, CL (1978). An Introduction to Plant Viruses. S. Chand & Co., New Delhi.

B. Sc. BOTONY

SEMESTER –VI

MAJOR ELECTIVE COURSE – II.

BIOCHEMISTRY

UNIT - I

15 Hrs

Atomic structure of elements. Bonding: Covalent and non-covalent bonds - Hydrogen bond, Van der Waal's forces. Structure and properties of water, Acids and Bases - pH and Buffer system.

UNIT - II

15 Hrs

Carbohydrates: Structure and properties of Mono - Disaccharides –Polysaccharides. Chemical structure and function of starch and cellulose.

UNIT - III

15 Hrs

Amino acids: Basic structure & properties (physical and chemical); function, Essential and standard amino acids. Proteins: structure-peptide bond -solubility and composition. The peptide bond- primary structure-secondary structure- tertiary structure -quaternary structure – function of protein

UNIT - IV

15 Hrs

Enzymes: Nomenclature, classification -mechanism and regulation of enzyme action, enzyme kinetics, factors affecting enzyme action.

UNIT - V

15 Hrs

Lipids - structure of simple lipid and compound lipid (phospholipids and glycolipids), fatty acids-saturated and unsaturated fatty acids-Secondary carbon metabolism and the metabolites: Polyphenolics - Terpenoids and Alkaloids.

Text Books

Rastogi , S.C (2003). Outlines of Biochemistry , CBS Publishers &Distributors , New Delhi

Stryer, L., (1988). Biochemistry, WH Freeman & Co., NY.

Jain J.L. *et al.*,(2008). Fundamentals of Biochemistry, Chand ,New Delhi

Conn E.E, Stumpf , Bruening G, Doi RH.(2005) . Outlines of Biochmistry 5/Ed, Wiley &Sons Pvt . ltd.

Satyanaryana U, Chakrapaani U, (2006). Biochemistry, Books and Allied (P)Ltd.

Reference Book

Apps *et al.*, (1992). Biochemistry, ELBS.

Caret *et al.*, (1993). Inorganic, Organic and Biological Chemistry, WMC Brown Pub. USA.

Nelson D.L, Cox M.M.(2005). Lehninger Principle of Biochemistry, W.H. freeman and Company, New York

Rawn, D. (1989).Biochemistry, Neil Patterson.

Zuley G.L., (1998).Biochemistry, Wm. C .Brown Publishers USA.

B. Sc. BOTONY

SEMESTER –VI

SKILL BASED ELECTIVE COURES -VIII

SEED TECHNOLOGY

UNIT - I

6 Hrs

Floral biology. Seed formation. Seed morphology and structural details of Dicot (Castor) and Monocot (Paddy) seeds. Roles and goals of seed technology, importance of quality seeds in agriculture, characteristics of quality seed.

UNIT - II

6 Hrs

Seed sampling – Method of sampling – Seed Purity – Seed Germination – Methods of Seed Germination using paper, Sand or soil – Standard Germination Test. Seed dormancy.

UNIT - III

6 Hrs

Seed viability – Topographical tetrazolium or T2 test embryo excision method. Seed moisture Importance – methods of moisture determination basic methods.

UNIT - IV

6 Hrs

Certified seed production of the following Paddy, groundnut, and cotton.

UNIT - V

6 Hrs

Seed certification – objectives – fundamental concepts of seed certification – sources and classes of seed: Breeder's seed, certified seed. Seed analysis – Tagging of seedlings – field standards.

REFERENCES:

Agarwal, R.L. Seed Technology Oxford and IBH Publishing Co. Pvt. Ltd.,

Bewley J.D. and Black M (Edn) 1985 – Seed Physiology of development and germination, Plenum Press, New York.

Kowalsky. Seed Biology, Vol. I, Vol. II and Vol. III. Academic Press, New York.

B. Sc. BOTONY**ALLIED BOTANY****FIRST /SECOND ALLIED COURSE – I****THALLOPHYTES, BRYOPHYTES, PTRERIDOPHYTES, GYMNOSPERMS,
PLANT PHYSIOLOGY AND ECOLOGY.****UNIT - I****12 Hrs**

Thallophytes: Algae, general characters, study of the structure and life cycle of the following genera-*Oscillatoria*, *Oedogonium*, *Sargassum* and *Polysiphonia*.

Fungi: General Characters, study of the structure and life cycle of the following genera *Albugo*, *Penicillium*, *Agaricus*. Economic importance of fungi

UNIT - II**12 Hrs**

A general study of Bacteria and viruses. Economic importance of bacteria. Bryophytes: General Characters, study of the structure and life cycle of *Funaria*.

UNIT - III**12 Hrs**

Pteridophytes and Gymnosperms: Structure and lifecycle of *Lycopodium* and *Cycas*.

UNIT - IV**12 Hrs**

Plant Physiology: Osmosis, absorption of water. Photosynthesis -Light reaction, Calvin cycle. Respiration - Glycolysis, Krebs cycle, Electron transport system. Nitrogen cycle. Hormones (Auxins only)

UNIT - V**12 Hrs**

Plant Ecology: Factors affecting vegetation - climatic, edaphic and biotic. Morphological and anatomical adaptations in Hydrophytes and Xerophytes

BOOKS

Fuller HJ and Trippo O (1949) College Botany, Henry Holt & Co.

Ganguly AK (1975) General Botany Vol I (1971) & Vol II, The New Book Stall, Calcutta.

Rao, K.. Krishnamurthy, KV and Rao GS (1979) Ancillary Botany, S. Viswanathan Pvt. Ltd., Madras.

Palaniappan, S. (1985) Thavaraviyal Thunaippaadam (Tamil), Mohan Padippagam, Chennai.

Pandey B.P, 1986, Text Book of Botany (College Botany) Vol I and II, S.Chand and Co. New Delhi.

Rasool SK and Sekar T (2002). Allied Botany ,Populer Book Hour chennai -15.

B. Sc. BOTONY

ALLIED BOTANY

FIRST / SECOND ALLIED COURSE – III

**EXTERNAL MORPHOLOGY, TAXONOMY OF ANGIOSPERMS, CYTOLOGY,
GENETICS, ANATOMY AND EMBRYOLOGY.**

UNIT - I

12 Hrs

Morphology of Plant: Plant and its parts. Structure and function of Root and Stem. Leaf and its parts. Phyllotaxy, Types of leaf - simple, compound.

Inflorescence - Racemose, Cymose, Special types. Terminology with reference to flower description.

UNIT - II

12 Hrs

Taxonomy: Bentham and Hooker's system of classification. Study of the following families and their economic importance - Leguminosae, Cucurbitaceae, Rubiaceae, Asteraceae, Euphorbiaceae, Arecaceae.

UNIT - III

12 Hrs

Cytology: Ultra structure of plant cell and brief outline of cell wall, Plasma membrane, Endoplasmic reticulum, Mitochondria, Chloroplast, Nucleus.

Cell division - Mitosis and Meiosis. Genetics- Mendel's law. Mono and dihybrid cross.

UNIT - IV

12 Hrs

Anatomy: Meristem. Simple permanent tissues - Parenchyma, Collenchyma, Sclerenchyma. Complex permanent tissues - Xylem, and Pholem.

Primary structure of Dicot stem and Dicot root and Dicot Leaf. (Mesophytic only)

UNIT - V

12 Hrs

Embryology - Structure and development of anther, male gametophyte. Structure and development of ovule and female gametophyte (Polygonum type), Fertilization. Structure and development of dicot embryo (*Capsella* type).

PRACTICAL 3hr/week

To describe in technical terms plants belonging to any of the families prescribed and Identify the family.

To identify the plant family and morphology of the parts used for the following plant Specimens.

Arachis hypogea - Ground nut

Dolichos biflorus - Horse gram

Cicer arietinum - Bengal gram

Pisum sativum - Pea

Phaseolus mungo – Black gram

Phaseolus radiatus – Green gram

Tamarindus indica - Fruit

Abrus precatorius - Seed

Acacia concinna – Soap nut

Luffa aegyptiaca -Fibrous skeleton of the fruit

Cucumis sativus - Fruit

Coffea arabica - Seeds

Ixora - Flower

Cinchona officinalis - Plant

Musa Paradisica – Fruit

Phoenix sylvestris-Date fruit

Areca catechu-Nut

Cocos nucifera-Kernal

To make suitable Micropreparations, describe and identify materials of Algae, Fungi, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms prescribed.

To describe simple experimental set-up in plant physiology section of the syllabus.

B.Sc., BOTANY
MAJOR AND ALLIED BOTANY THEORY
QUESTION PAPER MODEL.

B.Sc., Degree Examination, APRIL / NOVEMBER

Time: 3 hrs.

Maximum: 75 Marks

Part - A:

(10 x 2 = 20 Marks) Answer all the questions.

All questions carry equal marks. Draw diagrams wherever necessary.

Each answer should not exceed 50 words

(Two questions from each unit)

1 & 2 - From UNIT-I

3 & 4 - From UNIT-II

5 & 6 - From UNIT-III

7 & 8 From UNIT-IV

9 & 10 - From UNIT-V

Part – B

5x5 = 25 marks) Answer all questions

All Question carry equal marks

(One question from each unit internal choice)

Each answer should not exceed 200 words.

Q.No. 11. a (or) B - UNIT-I

Q.No. 12. a (or) B - UNIT-II

Q.No. 13. a (or) B - UNIT-III

Q.No. 14. a (or) B - UNIT-IV

Q.No. 15. a (or) B - UNIT-V

Part – C

(3x10 = 30 marks) Answer any three questions

All Question carry equal marks.

Each answer should not exceed 500 words.

Q.No. 16. - UNIT-I

Q.No. 17. - UNIT-II

Q.No. 18 - UNIT-III

Q.No. 19. - UNIT-IV

Q.No. 20. - UNIT-V

MODEL QUESTION PAPER

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the academic year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER -I

CORE – I

PLANT DIVERSITY –I (ALGAE AND BRYOPHYTES)

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10 x 2=20 marks) Answer all questions

All questions carry equal marks, Draw diagrams wherever necessary, Each answer should not exceed 50 words.

Palmelloid form

SCP

Heterocyst

Gliding movement

Globule

Floridean Starch

Elater

Trabeculae

Calyptra

Peat moss

PART B**(5 X 5 = 25marks) Answer all questions;**

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary, Each answer should not exceed 200 words.

11. a) Enlist any ten character feature of Algae
Or
Briefly describe the pigmentation in algae
- a)Describe the Ultra structure of *Chlamydomonas*. Or
List out the prokaryotic characters in Cyanobacteria
- a) Briefly describe the structure of Chara sex organs Or
b) Explain the structure of Receptacles in *Sargassum*
- a)Describe the sporophyte structure of *Marchantia* Or
Give short account on Distribution of bryophytes

PART C**(5x 10 =30 Marks) Answer any three questions**

All Question carry equal marks .Draw diagrams. Wherever necessary, Each answer should not exceed 500 words.

Write an essay on classification of Algae by F.E.Fritsh

Give an account of sexual reproduction in *Oedogonium*

Briefly explain the post fertilization changes in Polysiphonia

Write an essay on classification of Bryophytes by Rothmaler

Describe the development of Sporangium and structure of mature sporangium in *Porella*.

MODEL QUESTION PAPER

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the academic year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTRE II

CORE COURSE – III

PLANT DIVERSITY – II

(FUNGI, LICHENS, BACTREIA AND VIRUSES)

Time: 3 Hrs.

Maximum: 75 marks

Hypha

Conidium

Budding

Heterokaryosis

Uredinispores

Diploidization

Isidia

Capsomers

PART A

(10 x 2 = 20 marks) Answer all questions

All questions carry equal marks, Draw diagrams wherever Necessary, each answer should not exceed 50 words.

Incipient nucleus

Pili

PART B

(5 X 5 = 25 marks) Answer all questions;

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary, Each answer should not exceed 200 words

- a)Write a note on the ultra-structure of fungal cell Or
Give an account of the useful aspects of Fungi.
- a)Describe the structure and asexual reproduction in *Albugo*.
Or
Describe structure and reproduction in *Peziza*
- a)Give an account the structure and life cycle of *Puccinia* Or
Write a brief note on *Cercospora*
- a)Write short notes on economic importance of Lichens.
Or
Give short notes on Cyanophages
- a)Write about Nutrition in Bacteria. Or
Describe the structure of Bacteria cell wall

PART C

(5 x 10 = 30 marks) Answer any three questions

All Question carry equal marks Draw diagrams.wherever necessary, Each answer should not exceed 500 words.

- Write an essay on classification of Fungi by Alexopoulos and Mims
- Write an essay on the structure and reproduction in *Albugo*
- Write about the structure and formation fruiting body of *Polyporus*.
- Diagrammatically describe the structure and Reproduction of T4 phage
- Give an account of the economic importance of Bacteria.

MODEL QUESTION PAPER

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the academic year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTRE -II

SKILLED BASED ELECTIVE COURSE – I

MUSHROOM CULTURE TECHNOLOGY

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10X2=20 marks) Answer all the questions.

All questions carry equal marks. Draw diagrams wherever necessary. Each answer should not exceed 50 words

Define mushroom.

Write the common name of *Pleurotus citrinopileatus* .

What are edible mushrooms?

What is mother spawn?

Define sterilization.

What is oatmeal agar medium?

What is mushroom bed?

List out materials used for mushroom cultivation.

Write the name of any two medicinal mushroom names and its application.

Write the name of any three national mushroom research centers.

PART B

(5 X5=25 marks) Answer all questions

All questions carry equal marks,(either a or b) Draw diagrams wherever necessary, Each answer should not exceed 200 words

a)Write short notes on *Agaricus bisporus* mushroom. Or

Write notes on scope of edible mushroom cultivation.

a)Describe the methods of sterilization.

Or

Write about the preparation of PDA medium.

a)Describe the factors affecting mushroom cultivation bed preparation. Or

List out the material required for mushroom cultivation.

a)List out the nutritional value of edible mushroom.

Or

What is short term and long term storage?

a)List out the application of mushroom cultivation Or

Write about the preparation of mushroom pickles.

PART C

(3 x 10 = 30Marks) Answer any three questions.

All Question carry equal marks. Each answer should not exceed 500 words

Explain briefly about *Pleurotus citrinopileatus*.

Give a brief account on *in vitro* mushroom cultivation.

Discuss in detail about mushroom cultivation in polythene bags.

Explain preparation of mushroom soup and cutlet.

List out the national and regional level mushroom research centers.

MODEL QUESTION PAPER

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the academic year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER – III

CORE COURSE – IV

ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10X2=20 Marks) Answer all the questions.

All questions carry equal marks. Draw diagrams wherever necessary. Each answer should not exceed 50 words

Procambium

Collenchyma

Vessels

Tyloses

Phellogen

Heart wood

Pollen kit

Polar nuclei

Endosperm

Anemophily

PART B

(5 x 5 = 25 Marks) Answer all questions

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary, Each answer should not exceed 200 words words

- a) Write in detail about quiescent center in plant root Or
Describe the Tunica carpus theory
- a) Give a short account on Annual rings or growth ring Or
Diagrammatically describe the structure of lenticels
- a) Describe the primary structure of Dicot stem
Or
Distinguish the internal structure of dicot root from monocot root
- a) Describe the T.S of mature Anther
Or
Write short notes on types of ovules
- a) Give short notes on nuclear endosperm Or
Discuss the pollination through water

PART - C

(3x10 = 30marks) Answer any three of following questions

All Question carry equal marks.Each answer should not exceed 500 words

Write essay on structure and function of Scelerids

Describe the different types of meristem and their function

18. Diagrammatically describe structure and development of Anomalous Structure of *Dracaena* stem

Write an essay on development of male gametophytes

Give a detail account on development of Dicot embryo.

MODEL QUESTION PAPER

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the academic year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER –III

SKILLED BASED ELECTIVE COURSE –II

HORTICULTURE

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10 x 2 = 20 marks) Answer ALL the questions

All questions carry equal marks Draw diagrams wherever necessary

Each answer should not exceed 50 words

Scope of horticulture

Formal garden

Layering

Grafting

Types of grasses

Pruning

Floriculture

Ikebana

Green house

Bonsai techniques

PART B

(5 x 5 = 25 marks) Answer all questions;

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary, Each answer should not exceed 200 words

- a). Give an account about Importance of horticulture Or
Classify the horticulture crops.
- a)What is budding? Briefly explain the methods of budding Or
Briefly explain the growth regulators.
- a)Write notes on weeding.
Or
Briefly explain the cultivation of Rose.
- a)How will you make dry flowers? Comment on its uses Or
Discuss the maintenance of nursery.
- a)Write notes on water gardens
Or
Write notes on hydroponic techniques.

PART C

(3x10 = 30 marks) Answer any three questions of following.

All questions carry equal marks. Each answer should not exceed 500 words.

What are the types of gardens? Critically discuss its designs.

Write an essay on the growth hormones and the applications to in horticulture.

Give the details of various types of lawn and a note on their aesthetic values.

Describe the cultivation methods of commercial flowers with two examples.

Discuss about the storage of horticultural crops.

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the academic year 2017 – 2018
onwards under CBCS Pattern)**

SEMSETRE- III

NON – MAJOR ELECTIVE COURSE – I

MUSHROOM CULTIVATION

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10 x 2=20 marks) Answer all the questions.

All questions carry equal marks. Draw diagrams wherever necessary.

Each answer should not exceed 50 words.

Define mushroom.

Write the common name of *Pleurotus citrinopileatus* .

What are edible mushrooms?

What is mother spawn?

Define sterilization.

What is oatmeal agar medium?

What is mushroom bed?

List out materials used for mushroom cultivation.

Write the name of any two medicinal mushroom names and its application.

Write the name of any three national mushroom research centers.

PART B

(5 x 5 = 25 marks) Answer all questions

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary, Each answer should not exceed 200 words words

- a)Write short notes on *Agaricus bisporus* mushroom. Or
Write notes on scope of edible mushroom cultivation.
- a)Describe the methods of sterilization.
Or
Write about the preparation of PDA medium.
- a)Describe the factors affecting mushroom cultivation bed preparation. Or
List out the material required for mushroom cultivation.
- a)Discuss the nutritional value of edible mushroom.
Or
What is short term and long term storage?
- a)List out the application of mushroom cultivation Or
Write about the preparation of mushroom pickles.

PART C

(3x10 = 30 marks) Answer any three questions.

All Question carry equal marks. Each answer should not exceed 500 words

- Explain briefly about *Pleurotus citrinopileatus*.
- Give a brief account on *in vitro* mushroom cultivation.
- Discuss in detail about mushroom cultivation in polythene bags.
- Explain preparation of mushroom soup and cutlet.
- List out the national and regional level mushroom research centers.

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the academic year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER –IV

CORE COURSE – VI

PLANT DIVERSITY- III

(PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY)

Time: 3 Hrs. Maximum: 75 marks

PART A

(10 x 2 = 20 marks) Answer all the questions.

All questions carry equal marks. Draw diagrams wherever necessary.

Each answer should not exceed 50 words

Actinostele.

What is apospory?

Ligule.

Vallecular canal

Sporocarp

Ramenta

Sago

Sulfur rain

How will you name a fossil plant?

Molds

PART B

(5 x 5 = 25 marks) Answer all questions

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary, Each answer should not exceed 200 words

- a)Bring out the salient features of Pteridophytes. Or
 “Pteridophytes are widely used as ornamental plants “ comment.
- a)Describe the various types of Steles in *Lycopodium*.
 Or
 Give an illustrate account of the Spore –producing organ of *Equisetum*
- a)Describe the Sorus in *Adiantum*.
 Or
 Write a short notes on anatomy of *Gleichenia* Stem
- a)Describe the structure *Pinus* ovule
 Or
 Why “Cycads are living fossils” ? Justify
- a)List out that Angiosperm Character in *Gnetum* Or
 Describe the stem of Calamites.

PART C

(3 x 10 = 30 marks) Answer any three questions.

All Questions carry equal marks. Each answer should not exceed 500 words.

- Write an essay on Heterospory and Seed habit
- Describe morphological features of *Selaginella* sporophyte
- Explain the male gametophyte in *Cycas*
- Write an essay on Economical importance of Gymnosperm
- Write a detail account of *Williamsonia* with suitable diagram

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the academic year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER –IV

SKILLED BASED ELECTIVE COURSE -III

PLANT TISSUE CULTURE

Time : 3 Hrs.

Maximum : 75 marks

PART A

(10 x 2 = 20 marks) Answer all the questions

All questions carry equal marks. Draw diagrams wherever necessary.

Each answer should not exceed 50 words

Haberlandt

Totipoteny

IAA

PVP

Callus

Turbidostats

Sodium Alginate

Liquid nitrogen

Erythrorhizon

Germplasm

PART B

(5x5 = 25marks) Answer all questions;

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary, Each answer should not exceed 200 words

- a)Write an account on the sterilization techniques. Or
Discuss the history and development of plant tissue culture
- a)Give an account on plant growth regulator used in plant tissue culture Or
How do you select explant? Explain
- a)Write a short notes on importance of organ culture
Or
Give a general account of cell suspension culture
- a)Write short notes on somatic hybridization.
Or
Describe the isolation of plant protoplast
- a)Write short notes on clonal propagation Or
Give a brief account on Gene conservation bank

PART C

(3x10 = 30marks) Answer any three questions.

All Questions carry equal marks .Each answer should not exceed 500 words

Give an outline of a plant tissue culture laboratory

What is culture medium? State the basic composition of general plant tissue culture medium

How the callus tissue is formed *in vitro*? Discuss the morphology, Internal structure and other characteristics of the callus tissue

What is somatic embryogenesis? Discuss the principle of Somatic embryogenesis

Discuss the importance of Plant tissue culture in plant pathology.

B Sc BOTANY

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the academic year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER –IV

NON –MAJOR ELECTIVE COURSE –II

HERBAL BOTANY

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10X2=20 marks) Answer all the questions.

All questions carry equal marks. Draw diagrams wherever necessary.

Each answer should not exceed 50 words

Materia Medica

Ayurveda

Ephedrin

Vincristine

Andrographolide,

Aloe vera uses

Psychoactive drug

Nux vomica

Cardio vascular drugs

Biomedicine

PART B

(5 x 5 = 25marks) Answer all questions

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary,

Each answer should not exceed 200 words.

- a)Give a Brief account on siddha Or
Write a short note on Unani.
- a)Give an account on phytochemistry of *Ginger* Or
Give an account of pharmaceutical importance of *Vinca rosea*.
- a)Brief account on therapeutic uses of *Aloe vera*.
Or
b) Give brief account on the utility value of *Bacopa monnieri*
- a)How will you cure the gastrointestinal disorders by using plant drugs
- a)Briefly explain Drying of crude drugs Or
Give a short notes on Storage of crude drug

PART C

(3 x 10 = 30 marks) Answer any three questions.

All Questions carry equal marks. Each answer should not exceed 500 words

Define the term drug and give an account on the classification of natural drugs.

Write down the cultivation, collection and natural drug preparation of *Rauwolfia Serpentine*

Write down the cultivation and utilization of *Andrographis paniculata*

Give brief account on herbal drug used for cure central nervous system disorder

Write an essay of drug Adulteration.

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the academic year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER –V

CORE COURSE – VII

MORPHOLOGY AND TAXONOMY OF ANGIOSPERMS

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10 x 2 = 20 marks) Answer ALL the questions.

All question carry equal marks. Draw Diagrams wherever necessary.

Each answer should not exceed 50 words.

Cladode

Compound leaf

Hypothodium

Drupe

Linnaeus

Holotype

Obdiplostemonous

Binomial of Clove

Resupination in orchid

PART B

(5 x 5 = 25 marks) Answer all questions

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary

Each answer should not exceed 200 words

a)Write a short account on Modifications of tap root. Or
Discuss the any four types of stipules.

a)Explain Head inflorescence.

Or

Give a brief account on placentation

a)Give a short account on Author citation Or

Briefly discuss the APG III system of classification

a)Give a brief account of identifying characters of Rutaceae. Or

Discuss the Types of androecium in *Cucurbitaceae*.

a)Give an account of floral characters of *Orchidaceae*

Or

List out the Economic importance plant in *Asclepiadaceae* family

PART C

(3 x 10 = 30 marks) Answer any Three questions.

All question carry equal marks.Each answer should not exceed 500 words.

Give an account of Aerial stem modifications.

Enumerate the types of Racemose inflorescence and explain.

Give an account of Bentham and Hooker's classification with merits and demerits.

Write an essay on Economic importance of *Apiaceae* with suitable example

Write about the family *Poaceae*.

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER –V

CORE COURSE – VIII

CYTOLOGY AND GENETICS

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10 x 2 = 20marks) Answer ALL the questions.

All question carry equal marks. Draw Diagrams wherever necessary.

Each answer should not exceed 50 words.

Robert brown

Semiautonomous organelle

Histone

Synaptonemal complex

Testcross

What is phenotype?

Define Crossing over.

What is linkage?

Define nullisomic.

What is polyploidy?

PART B

(5 x 5 = 25marks) Answer all questions;

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary

Each answer should not exceed 200 words.

a) Explain the fluid mosaic model of plasma membrane Or
Describe the ultrastructure of Mitochondria

a) Write short notes on lampbrush chromosome
Or

Write a brief account on double helix structure of DNA.

a) Discuss the Mendel's law.

Or

What do you know about epistasis?

a) What is crossing over? Explain its significance. Or
Explain cytoplasmic inheritance with an example.

a) Describe briefly on the types of polyploidy.

Or

Write short notes on the changes in chromosome structure?

PART C

(3 x 10 = 30marks) Answer any three questions.

All question carry equal marks. Each answer should not exceed 500 words.

Write an account on the structure and function of nucleus.

Explain the Mitotic cell division with suitable illustration

Write an essay on Multiple alleles

Discuss the cytoplasmic inheritance with suitable example.

Discusses Hardy –Weinberg law, using a hypothetical example of two alleles Locus

B Sc BOTANY

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER –V

CORE COURSE – IX

BIOINSTRUMENTATION AND BIostatctis

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10 x 2 = 20marks) Answer ALL the questions.

All question scarry equal marks. Draw Diagrams wherever necessary.

Each answer should not exceed 50 words.

Resolving power

Stage micrometry

FAA

Dehydration

Rpm

SDS

Beer lambert law

Standard deviation

Mean

PART B

(5 x 5 = 25marks) Answer all questions;

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary, Each answer should not exceed 200 words

- a)Give a short account on compound microscope Or
Describe a phase contrast microscope and its functioning
- a)Give an account of chemical fixative mixtures
Or
Describe the method of embedding specimens in paraffin wax.
- a)Write short note on types of rotors in centrifuge
Or
Explain the thin layer chromatography
- a)Discuss the structure and function of combine pH electrode Or
Write short note on principle of colorimetry
- a) What are the advantages of arithmetic mean over median Or
Significance of sampling in a population.

PART C

(3 x 10 = 30 marks) Answer any Three questions.

All question carry equal marks .Each answer should not exceed 500 words.

Describe the components and functioning of a transmission Electron Microscope

Why should biological material be dehydrated? explain the principle involved in dehydration

Explain the basic principle involved in separation of protein by Electrophoresis

With a neat diagram, explain the parts and functions of a spectrophotometer

Calculate standard deviation for the following data: Marks 102030405060 No.
of Students 812201073

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER –V

MAJOR ELECTIVE COURES I

PLANT BIOTECHNOLOGY

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10x2 = 20 Marks) Answer all the questions:

All questions carry equal marks. Draw diagrams wherever necessary

Each answer should not exceed 50 words

Shuttle vector

Define restriction endonuclease

Lipofection

Octopine

Taq polymerase

RAPD

Golden rice

Flavr savr

SCP

Biogas

PART B (5 x 5 = 25marks)

Answer all questions;

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary

Each answer should not exceed 200 words

a)Write an account on History and development of biotechnology Or
Write short notes on enzymes used in recombinant DNA technology.

a)Explain the microinjection
Or
Diagrammatically describe the structure Ri plasmid

a)Write short notes on DNA fingerprinting
Or
Discuss the DNA sequence analysis

a)Write about Antisense RNA technology Or
How is genetic engineering used to create bacteria capable of producing human insulin?

a)What are the biological agents used in hazardous waste management?
Or
Define bioremediation, discuss the different process, strategies for bioremediation using microbes

PART C

(3 x 10 = 30 marks) Answer any three questions.

All questions carry equal marks. Each answer should not exceed 500 words.

Write an essay cloning vectors used in Recombinant DNA technology

Write an account on *Agrobacterium* mediated gene transfer

Explain the procedure for DNA amplification using PCR.

Write an essay on Hybridoma technology and its application

Discuss the application of biotechnology in pharmaceutical industry

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER –V

SKILL BASED ELECTIVE COURSE - IV

AGRICULTURAL MICROBIOLOGY

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10 x 2 = 20 marks) Answer ALL the questions.

All question carry equal marks. Draw Diagrams wherever necessary.

Each answer should not exceed 50 words.

Rhizosphere

Nitrogen fixation

Leghemoglobin

YEMA medium

Azolla

Nitrogenase enzyme

Inoculant

Mycorrhiza

Green manure

Biocompost

PART B

(5 x 5 = 25marks) Answer all questions

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary, Each answer should not exceed 200 woraaads

- a)explin the role of rhizosphere mircogranism in imorpving the soil fertility Or
What are major contribution of phosphate solubilizing bacteria in plant functioning
- a)Discuss the methods of inoculum production of Rhizobium
Or
Discuss the field application method of *Azospirillum*
- a)Give the steps of mass cultivation of *Anabaena azollae* Or
Explain the role of cyanobacteria in agriculture
- a)Explain the morphology of AM
Or
Discuss the types of Mycorrhiza association
- a)What is the significance of organic farming ?
Or
Explain the organic farming practices used in rice farming

PART C

(3 x 10 = 30 marks) Answer any Three questions.

All question carry equal marks. Each answer should not exceed 500 words.

Write essay on Agriculture important soil microflora

Give a detailed account of mass cultivation of *Azospirillum*

Explain the procedure for large scale production of algal flakes.

Give an account on the method of isolation and inoculum production of AM

Write essay on the method of preparation of vermicopost.

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER V

SKILL BASED ELECTIVE COURSE – IV

PLANT BREEDING AND PLANT UTILIZATION AS FOOD

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10 x 2 = 20 marks) Answer ALL the questions.

All question carry equal marks. Draw Diagrams wherever necessary.

Each answer should not exceed 50 words.

Plant introduction

Pure line

Hybrid vigour

Polyploidy

Binomial of foxtail millet

Mention any two variety of *Cajanus cajan*

Coconut oil

Carpophore

Organic acid in papaya

Origin of onion

PART B (5 x 5 = 25 marks) Answer all questions;

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary, Each answer should not exceed 200 words

a)Write short notes on Domestication of plants

Or

Give a detailed account on origin for cultivated plant

a)Discuss the various types of hybridization

Or

Write short notes on Aneuploidy breeding

a)Give a detailed account on cultivation of Rice

Or

List out any five pulses variety with nutritive content

a)Discuss the byproduct of sugar industry

Or

Write short notes on important of Ground nut oil

a)Give a detailed account general properties of fruits Or

Discuss the nutritive value of onion

PART C

(3 x 10 = 30marks) Answer any Three questions.

All question carry equal marks. Each answer should not exceed 500 words.

Write an essay on the methods of selection that can be employed in self –pollinating crops

Write an essay on mutation breeding and its potential and limitation

Describe origin, distribution and cultivation of Red gram

Classify the vegetable fatty oil and their uses

Write a detailed account on cultivation and uses of Papaya

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER –VI

CORE COURSE – XI

PLANT PHYSIOLOGY

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10 x 2 = 20 marks) Answer ALL the questions.

All question carry equal marks. Draw Diagrams wherever necessary.

Each answer should not exceed 50 words.

Osmosis.

Trace elements.

Quantosomes

Emerson enhancement effect.

Fermentation.

ATP and NADP

Transamination.

Proline .

Phototropism.

Senescence.

PART B

(5 x 5 = 25marks) Answer all questions

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary

Each answer should not exceed 200 words

a)Explain the Active absorption Or

Give the role of macro elements.

a)Discuss the CAM pathway

Or

Write notes on the factors affecting photosynthesis.

a)Describe the glycolysis

Or

Explain oxidation phosphorylation.

a)Give short notes on nitrification Or

Explain the water stress

a)Define nastic movements. Briefly explain seismonastic movement Or

What are the physiological role of gibberellins

PART C

(3 x 10 = 30marks) Answer any Three questions.

All questions carry equal marks. Each answer should not exceed 500 words.

Explain the mechanism of Stomatal movement.

Describe the calvin cycle.

Explain the process of Krebs cycle

Write an essay on Nitrate assimilation

Write an account on the Physiological role of auxin and ethylene.

B Sc BOTANY

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER –VI

CORE COURSE – XII

PLANT ECOLOGY AND PLANT GEOGRAPHY

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10 x 2 = 20 marks) Answer ALL the questions:

All questions carry equal marks Draw diagrams wherever necessary

Each answer should not exceed 50 words

Rainfall

Autecology

Primary productivity

Autotrophs

Migration

Colonization

BOD

Acid rain

Hotspots

Willis

PART B

(5 x 5 = 25 marks) Answer all questions;

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary,

Each answer should not exceed 200 words

a) Write briefly about the effect of wind on plants. Or
Define thermoperiodism.

a) How grazing by animals influence vegetation? Or
Illustrate the pyramid of biomass.

a) Explain the Hydrarch succession
Or
Describe the character feature of Hydrophytes

a) Describe about soil pollution.
Or
Give short notes on e-waste

a) What is evergreen forest? Give examples. Or
Explain continental drift theory

PART C

(3 x 10 = 30 marks) Answer any three questions.

All questions carry equal marks .Each answer should not exceed 500 words.

Give an account of the effects of temperature on plants.

Write an essay on pond Ecosystem

Explain the adaptations of Xerophytes.

Give an account on the causes and control measures of water pollution.

Write a detail account on *in situ* and *ex situ* conservation.

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER –VI

CORE COURSE – XIII

PLANT PROTECTION

**Time : 3 Hrs.
marks**

Maximum : 75

PART A

(10x2 = 20marks) All questions carry equal marks

Draw diagrams wherever necessary. Each answer should not exceed 50 words

Any two disease causing fungi

Nematodes

Quarantine

Endemic disease

Damping off

Smut disease

Canker

Rot disease

TMV

Define yellow disease

PART B

(5 x 5 = 25marks) Answer all questions;

All questions carry equal marks, (either a or b). Draw diagrams wherever necessary, Each answer should not exceed 200 words

- a) Explain the symptoms cause by fungi Or
Briefly explain the loss incurred by rodent pests in India
- a) Explain the role of Quarantine is protection
Or
Write short notes on Seed certification
- a) Give a brief account on Bud rot of coconut. Or
Write short notes on Tikka disease of ground nut
- a) Explain the important symptoms seen in bacterial disease Or
What are the symptoms seen in ring rot of Potato in field condition. Illustrate
- a) Explain the spreads and symptoms cause by Bunchy top of banana.
Or
Discuss the Mosaic disease in lady finger

PART C

(3 x 10 = 30) Answer any three questions.

All questions carry equal marks. Each answer should not exceed 500 words.

Why have more pest problem arisen in recent years as compared to the pest

Give a brief account about weed control

Write about the causal agent, disease spread, symptoms and control measures of paddy blast.

Explain citrus canker disease and its control measures.

Give an account of Tobacco mosaic disease.

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER –VI

MAJOR ELECTIVE COURSE – II

. BIOCHEMISTRY

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10 x 2 = 20 marks) All questions carry equal marks

Draw diagrams wherever necessary. Each answer should not exceed 50 words

Van der Waals forces

Define acid

Monosaccharide

Mutarotation

Peptide bond

Structure of glycine

Co-factor

Oxidative enzyme

Define saturated fatty acid

Alkaloids

PART B

(5 x 5 = 25 marks) Answer all questions

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary, Each answer should not exceed 200 words

- a)Describe the structure of water molecule Or
Discuss pH and its significance
- a)Describe the Structure and importance of sucrose Or
Explain the Reducing property of carbohydrates
- a)Write short notes on Amphoteric property of protein Or
List out Essential and non-essential amino acids
- a)Discuss the factor affecting enzyme action
Or
Describe important properties of enzymes
- a)Write a brief account on Biological significance of lipid Or
How are fatty acid classified

PART C

(3 x 10 = 30 marks)

Answer any three questions.

All questions carry equal marks. Each answer should not exceed 500 words.

- What are buffer s/ elucidate their role in biological system
- Describe the structures and functions of cellulose
- Describe the structure of protein
- How are enzyme classify? Add a note on mechanism of enzyme action
- Write an essay on Terpenoids.

B. Sc., BOTANY DEGREE EXAMINATION

**(For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern)**

SEMESTER –VI

SKILL BASED ELECTIVE COURSE - VII

SEED TECHNOLOGY

Time: 3 Hrs.

Maximum: 75 marks

PART – A

(10x2 = 20 marks) Answer ALL the questions:

All questions carry equal marks. Draw diagrams wherever necessary

Each answer should not exceed 50 words

Define cross pollination

Structure of Monocot seed

Seed vigor

Seed dormancy

G.Cot DH 7

Grow out test

Roguing

Define seed rate

Supplementary pollination

What is seed clearing?

PART B

(5 x 5 = 25 marks) Answer all questions

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary, Each answer should not exceed 200 words

- a)Mention the characters of quality of seed Or
Write short notes on isolation of seed crops.
- a)What are the requirements for germination tests? Or
Give an account on seed dormancy and breaking methods
- a)Give an account on seed viability test
Or
How would you test moisture content of a seed?
- a)Write a Rules and regulations guiding the production of paddy seed Or
Seed Standard for Certified Hybrid cotton seed
- a)Explain the different methods of seed drying.
Or
What are all the classes of seeds?

PART C

(3 x 10 = 30 marks) Answer any three questions.

All questions carry equal marks. Each answer should not exceed 500 words.

Write an essay on the principles of seed production in self-pollinated crops.

Write an essay on Different types of seed germination

Briefly write about the certified seed production of groundnut

Give an account on the seed vigor and its importance.

Write the procedure of field inspection on different stages of seed production of paddy.

B Sc BOTANY

MODEL QUESTION PAPER

ALLIED BOTANY – I

**(For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern)**

FIRST /SECOND ALLIED COURSE – I

Time: 3 Hrs.

Maximum: 75 marks

PART - A

(10x2=20 marks) Answer all the questions

All questions carry equal marks. Draw diagrams wherever necessary.

Each answer should not exceed 50 words

Hormogone

Capcells

Capsomere

Basidiocarp of Agaricus

Protonema

Protocorm

Auxin

Osmosis

Commensalism

Symbiosis

PART B

(5X5 = 25 marks) Answer all questions

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary, Each answer should not exceed 200 words.

11. a) Explain the asexual reproduction in *Oedogonium*.

Or

Describe the vegetative reproduction in *Oscillatoria*.

a)Economic importance of Fungi

Or

Asexual reproduction in *Albugo*.

a)Describe the structure of capsule in *Funaria*.

Or

Explain the Coralloid root of *Cycas*.

a)Describe the absorption of H₂O

Or

Explain Ammonification and Nitrification.

a)Describe succulent Xerophytes.

Or

How light effect the vegetation

PART C

(3 x 10 = 30 marks) Answer any Three questions

All Question carry equal marks. Each answer should not exceed 500 words.

Describe the alternation of generation in *Ectocarpus*.

Describe the structure and reproduction in *Bacteria*.

Describe the reproduction in *Cycas*.

Describe *Kreb's Cycle*.

Describe *Biotic factors*.

MODEL QUESTION PAPER

ALLIED BOTANY – II

**(For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern**

FIRST/SECOND ALLIED COURSE – III

**EXTERNAL MORPHOLOGY, TAXONOMY OF ANGIOSPERMS, CYTOLOGY,
GENETICS, ANATOMY AND EMBRYOLOGY.**

Time: 3 Hrs.

Maximum: 75 marks

PART A

(10x2=20 marks) Answer all the questions

All questions carry equal marks. Draw diagrams wherever necessary.

Each answer should not exceed 50 words

Epigynous Flower

Define phyllotaxy.

What type of inflorescence found in Musaceae?

Write note on syngenesious anther.

Which part of a cell is called power houses?

Write two kinds of endoplasmic reticulum.

Define meristem.

Name of the cells found in xylem.

What is tapetum?

How many cells are there in an embryo?

PART B

(5 x 5 = 25 marks) Answer all questions

All questions carry equal marks,(either a or b).Draw diagrams wherever necessary, Each answer should not exceed 200 words

a)Describe the different types of phyllotaxy Or
Explain the types of leaf

a)Write down the economic importance of *Arecaceae*. Or
What are the salient features of *Cucurbitaceae*

a)Briefly explain the functions of ribosomes.
Or
Describe the incomplete dominance.

a)Write short notes on the structure and function of parenchyma. Or
With suitable diagram explain the internal structure of a dicot leaf.

a)Write short notes on fertilization.
Or
Explain the structure of an ovule.

PART C

(3 x 10 = 30 marks) Answer Any Three questions

All Question carry equal marks each answer should not exceed 500 words.

Describe the Racemose inflorescence.

Write the distinguishing characters and economic importance of family *Leguminosae*,

Write an essay about mitosis.

With suitable diagrams explain the primary structure of in dicot root.

Describe the structure and development of embryo in dicots'

MODEL QUESTION PAPER

B. Sc., Botany Degree Examination

**((For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern))**

CORE COURSE – II

MAJOR PRACTICAL I (Covering the core courses I & III)

(ALGAE, BRYOPHYTES, FUNGI, LICHENS, BACTERIA, VIRUSES)

Time : 3 Hrs.

Maximum: 75 marks

Cut transverse section of **A, B** and **C**. Stain and mount in glycerin. Identify

giving reason. Draw diagrams. Leave the slides for valuation. (7 x 3 = 21)

2. Draw diagrams and write notes of interest on **D, E, F**, and **G**. (4 x 4 = 16)

Name the genus, group and morphology of given part of **H, I** and **J**.

(Diagrams not Necessary) 3 x 3 = 9

4. Identify and write notes on economic importance of **K** and **L**. 2 x 2 = 4

KEY

A - Algae

B - Fungi

C - Bryophytes

(Prepeaption-1, Identification -1, Diagram -2 , Reason -3) (7 x 3 = 21)

D - Algae- slide

E - Fungi- slide

F - Bryophyte-slide

G - Lichens- fruit body (Identification -1, Diagram -1 , Reason -2) (4 x 4 = 16)

H - Algae I-Fungi J.Bryophyte (Genus 1, Group 1, Morphology 1) (3 x 3 = 9)

K - Algae

L - Fungi (identification 1,Reason 1) (2 x 2 = 4)

MODEL QUESTION PAPER**B. Sc., Botany Degree Examination**

**((For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern))**

CORE COURSE – V**MAJOR PRACTICAL II (Covering the core courses IV & VI)**

**(ANATOMY & EMBRYOLOGY OF ANGIOSPERM, PTERIDOPHYTES,
GYMNOSPERMS AND PALEOBOTANY)**

Time : 3 hrs.**Maximum: 60 Marks****Practical: 50 Marks****Record : 10 Marks**

Cut transverse sections of **A**, **B** and **C**. Stain and mount in glycerin. Identify giving Reasons. Draw diagrams. Leave the slides for valuation. (8X3=24 marks)

2. Make a suitable micro preparation of **D**. Identify giving reasons. Draw diagrams. Leave the Slides for valuation. (6 marks)

Dissect and mount any one of the stages of the given material **E**. (notes not necessary) (4 Marks)

Name the genus, group and morphology of given part of **F** and **G**. (2X3=6 marks)

Write notes on **H**, **I**, **J**, **K** and **L**. (5X2=10 marks)

KEY

Angiosperm – Anatomy – Vegetative part. B. Pteridophyte – Anatomy – Vegetative part. C. Gymnosperm - Anatomy – Vegetative part. (Preparation 2, Identification 2, Diagram 2, Reason 2) (8X4=24 marks)

Reproductive part – Pteridophyte (or) Gymnosperm. (Preparation 2, Identification 1, Diagram 1, Reason 2) (6 marks)

Embryo – dicot – Tridax - (preparation 3, diagram1) 4 mark

F & Macroscopic – Pteridophyte (or) Gymnosperm.
(Genus 1, Group 1, Morphology 1) (2 x 3 = 6 mark)

H, I, Permanent slides (Anatomy, Embryology,
J, K Pteridophytes, Gymnosperms, Fossil slides)
and (Identification 1, Reason 1) (5X2=10)

L.

MODEL QUESTION PAPER

B. Sc., Botany Degree Examination

**((For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern))**

CORE COURSE – X

MAJOR PRACTICAL III

(Covering the core courses VII, VIII&IX)

**(MORPHOLOGY AND TAXONOMY OF ANGIOSPERMS, CYTOLOGY AND
GENETICS, BIOINSTRUMENTAION AND BIOSTATISTICS)**

Maximum: 60 Marks

Practical : 50 Marks

Record: 10 Marks

Refer **A** and **B**, to their respective families. Point out the characters on which the identification is based at each level. (Diagrams not necessary) (2 x 4=8 Marks)

2. Make acetocarmine preparation of **C** (Squash) any one stage. draw diagram (4 Marks)

Describe **D** in Technical terms. Draw diagrams of the floral parts only.

Construct the floral Diagram. Give the floral formula (5 Marks)

4. Construct the chromosome map with the data provided **E** (5 marks)

5. Solve the given genetic problem **F** and **G** (2 x 3=6marks)

Determine the quantity /concentration of sample by using given

H Biochemical Instrument - (6 marks)

7. Spot at sight **I** and **J** 2 x 2 = 4

Write the name of the genus, species, family and morphology of the

useful parts of **K &L** (4 x 2 = 8 marks)

9. Identify and write notes on **M** and **N** (2 x 2 = 4 marks)

KEY

A & B-Family - (2 x 4 = 8 marks)

C-Onion root tip - (preparation =3 marks , diagram -1 marks) D-Plant with flowers.

(preparation -1 marks, Floral diagram – 2 marks, Floral formula -2 marks)

E-Chromosome map - 5 marks

F&G-Genetic problems – (2 x 3 =6 Marks)

H-Bioinstrumentation experiment –(Procedure – 4 marks, Result -2 marks) = 6 marks

I&J-Cytology spotter - Identification -1 marks, Reason -1 2 x x2=4

K& L -Morphological parts: Genus -1mark, Species -1 marks, family-1mark,

Morphology -1 mark

M. - Micro technique - identification 1 mark, Reason -1 mark

N- Biostatistics - Identification 1 mark, Reason -1 mark

MODEL QUESTION PAPER

B. Sc., Botany Degree Examination

**((For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern))**

CORE COURSE – XIV

MAJOR PRACTICAL IV

(Covering the core courses XI, XII & XIII)

**(PLANT PHYSIOLOGY, PLANT ECOLOGY AND
PLANT GEOGRAPHY, PLANT PROTECTION)**

Maximum: 60 Marks

Practical : 50 Marks

Record: 10 Marks

Outline the procedure, apparatus and materials required for investigating the physiological Problem. **A**, assigned. Set up the experiment.

Tabulate the data obtained and report the Results. Leave the set up for valuation. (10)

Based on morphological and anatomical characters, assign, **B** and **C** to their respective probable habitats. Draw suitable diagrams. Submit slides for valuation. $2 \times 5 = 10$

3. Estimate dissolved oxygen content of **D** given water sample 10 marks

4. Draw and comment on the set up **E** (6 marks)

Identify the causal organism of the diseased material '**E**'. Draw diagrams.

Describe the symptoms and list the control measures. (10 marks)

6. Comment on '**F**' 2 Marks

7. Locate two phytogeographical zones in the map **G** provided - 2 marks

Key

A - Physiology : Procedure & material – 6 marks, Setup – 2 marks, Result - 2marks = 10 marks

B & C : Ecology material: preparation -1 marks, identification -1 mark, Reason -3 marks = $2 \times 5 = 10$ marks

Estimation of DO in water sample - Procedure– 6 marks, calculation- 2 marks Result - 2 marks=10 marks

E - Physiology set up - Identification – 2 marks; Diagram -2 marks, Reason – 2 marks =6 marks

E - Any disease in the syllabus - Name disease – 2 marks, Causative organism – 2 marks, Symptom – 2 marks, Control measure – 2 marks, Diagram – 2marks =10 marks

F - Plant protection appliances – 2 marks

G - Phytogeography – Vegetation maps -2 marks

MODEL QUESTION PAPER

B.Sc., ALLIED BOTANY PRACTICAL

**(For Students Admitted from the Academic Year 2017 – 2018
onwards under CBCS Pattern)**

FIRST / SECOND ALLIED COURSE – II

Time : 3 hrs.

Maximum: 60 Marks

Practical : 50 Marks

Record : 10 Marks

1. Refer **A & B** to their families giving reasons (Diagrams not necessary) 10 Mark
Identify the plant, family and morphology of the parts used for
C, D, E, F and **G**. 15 mark
Cut transverse section of **H & I**. Stain and mount in Glycerin.
Identify giving reasons. Draw diagrams. Submit the slides for valuation. 10 marks
4. Write critical notes on **J, K, L, M, N, O**. Draw diagrams. 12 mark
5. Physiology Experiment **P** 3 mark

KEY

- For A and B - Any two plants prescribed in the syllabus.
(Reasons 3, Identification -2) 2 x 5 = 10 marks
- 2 For C, D, E, F and G - any 5 specimens given in the practical syllabus. 5 x 3 = 15 Marks
 3. For H and I – (Slide -2 Identification -1 Reasons – 2) 2 x 5 = 10 marks
 4. Notes 1, Diagram 1 for J, K, L, M, N, O (2 x 6 = 12 marks)
 5. Physiology Experiment P 3 Marks