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 us 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. CONDITION FOR ADMISSION

A candidate who has passed Higher Secondary Examination in Academic or vocational stream with Botany/Biology under higher secondary board of examination, Tamil Nadu or an examination accepted as Equivalent there to by the syndicate subject to such conditions as may be prescribed thereto are permitted to appear and qualify for the B.Sc degree examination of this university after a course of study of three academic years.

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.

5. 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**

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**

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

6. 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.

8. 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.

9. 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 from the Year 2017 onwards

PART	CODE	COURSE	Inst. Hrs.	Credit	Exam. Hours	MARKS		
						CIA	EA	TOTAL
SEMESTER – I								
I	Language	Tamil - I	6	3	3	25	75	100
II	Language	English - I	6	3	3	25	75	100
III	Core I	Algae Plant Diversity - I	5	5	3	25	75	100
	Core II	Practical	3	**Practical Assessment & Credit carried to II Sem Core Cours II**				
	Allied - I	Zoology or Chemistry	4	3	3	25	75	100
	Allied - II	Practical	3	**Practical Assessment & Credit carried to II Sem First Allied II**				
IV				**Examination and credit carried to II Sem**				
	Value Education	Yoga	2	3	3	25	75	100
SEMESTER – II								
I	Language	Tamil - II	6	3	3	25	75	100
II	Language	English - II	6	3	3	25	75	100
III	Core III	Plant Diversity - II	5	5	3	25	75	100
	Core II	Practical	3	3	3	40	60	100
	Allied - III	Zoology or Chemistry	4	4	3	25	75	100
	Allied - II	Practical	3	3	3	40	60	100
IV	SBEC - I	Mushroom Culture Technology	2	2	3	25	75	100
		Environmental studies	1	2	3	25	75	100
SEMESTER – III								
I	Language	Tamil - III	6	3	3	25	75	100
II	Language	English - III	6	3	3	25	75	100
III	Core - IV	Anatomy and Embryology of Angiosperms Anatomy	4	4	3	25	75	100
	Core - V	Practical	3	**Practical Assessment & Credit carried to IV Sem Core Cours V**				
	Allied -I	Zoology or Chemistry	4	4	3	25	75	100
	Allied - II	Practical	3	**Practical Assessment & Credit carried to IV Sem Second Allied II**				
IV	SBEC - II	Horticulture	2	2	3	25	75	100
	NMEC - I	Mushroom Cultivation	2	2	3	25	75	100

PART	CODE	COURSE	Inst. Hrs.	Credit	Exam. Hours	MARKS		
						CIA	EA	TOTAL
		SEMESTER – IV						
I	Language	Tamil - IV	6	3	3	25	75	100
II	Language	English - IV	6	3	3	25	75	100
III	Core - VI	Plant Diversity III	4	4	3	25	75	100
	Core -V	Practical	3	3	3	40	60	100
	Allied - III	Zoology or Chemistry	4	3	3	25	75	100
	Allied -II	Practical	3	3	3	40	60	100
IV	SBEC - II	Plant Tissue culture	2	2	3	25	75	100
	NMEC - II	Herbal Botany	2	2	3	25	75	100
		SEMESTER – V						
III	Core -VII	Morphology and Taxonomy of Angiosperms	5	5	3	25	75	100
	Core -VIII	Cytology and Genetics	5	5	3	25	75	100
	Core -IX	Bio Instrumentation and Bio Statistics	5	5	3	25	75	100
	Core- X	Practical (Core course -VII,VIII&IX)	3+3					
	Elective	Plant biotechnology	5	5	3	25	75	100
IV	SBEC - IV	Agricultural microbiology	2	2	3	25	75	100
	SBEC - V	Plant breeding and Plant utilization as food Plant Breeding	2	2	3	25	75	100
		SEMESTER – VI						
III	Core - XI	Plant physiology	5	5	3	25	75	100
	Core - XII	Plant Ecology & Plant geography	5	5	3	25	75	100
	Core -XIII	Plant Protection	5	5	3	25	75	100
	Core - X	Practical (V Sem Core course)	3	4	3	40	60	100
	Core - XIV	Practical (Core course XI, XII&XIII)	3+3	4	3	40	60	100
	Elective	Biochemistry	5	5	3	25	75	100
IV	SBEC - VI	Medico -Ethnobotany	2	2	3	25	75	100
	SBEC - VII	Seed technology	2	2	3	25	75	100
		~~Extension Activities~~	1					

SBEC - Skill Based Elective Courses

NMEC - Non Major Elective Courses

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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**

1. 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*
2. 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

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

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

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

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

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

Reference books:

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

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

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

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

BRYOPHYTES Text Books

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

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

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

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

Reference Books

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

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

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

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

6. 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**

1. 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

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

Reference book

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

LICHENS

Reference Books

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

BACTERIA Text books

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

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

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

Reference Books

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

VIRUSES Text Books

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

Reference Books

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

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

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

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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, pickels, 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:

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

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

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

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

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

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

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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 Ruminate. Endosperm haustoria. Development of Embryo in Dicot (*Capsella-bursa pastoris*). Polyembryony.

PRACTICALS

ANATOMY OF ANGIOSPERMS

1. Study of simple and complex tissues by using permanent slides.
2. Study of primary structure and sectioning of Dicot stem, root, leaf, Monocot stem, root and leaf.
3. Normal secondary thickening in Dicot stem and root.

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

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

EMBRYOLOGY OF ANGIOSPERMS

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

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

3. Stages in Microsporogesis and Megasporogensis (Permanent slides onion flower Bud).

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

5. Dissection of embryo and observe the globular and Heart shape

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

ANATOMY

Text Book

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

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

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

Reference Book

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

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

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

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

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

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

7. Coutler E.G (1969) *Plant Anatomy-Part1 Cells and Tissues* –Edward Arnold London

EMBRYOLOGY Text Book

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

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

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

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

Reference book

1. Johri, B.M. 1(1984). Embryology of Angiosperms, Springer-Verlag

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

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

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

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

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

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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

1. Kumar, N., (1997). Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
2. Edmond Musser & Andres (1994) Fundamentals of Horticulture, McGraw Hill Book Co., New Delhi.
3. 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

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

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

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

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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, pickels, 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

1. Marimuthu, T. Krishnamoorthy, A.S. Sivaprakasam, K. and Jayarajan. R (1991) Oyster Mushrooms, Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.
2. Swaminathan, M. (1990) Food and Nutrition. Bappco, The Bangalore Printing and Publishing Co. Ltd., Bangalore .
3. Tewari, Pankaj Kapoor, S.C., (1988). Mushroom cultivation, Mittal Publications, Delhi.

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

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

6. 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, Aposopory 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**

1. Study of the Habit, TS of leaf and Stem, Morphology of Reproductive structures of Following Pteridophytes. *Lycopodium, Selaginella*, *Equisetum , Gleichenia , Adiantum* and *Marsilea*
2. Study of the Habit, TS of leaf and stem, Morphology of Reproductive structures of following gymnosperm genera *Cycas , Pinus* and *Gnetum*
3. Study the following fossil members , *Lepidodendron Lepidocarpon , Calamites , Williamsonia* through permeant slides

PTERIDOPHYTES

Text books

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

Reference books

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

GYMNOSPERMS Text books

1. Sharma, OP (2015). Gymnosperms, Pragati Prakashan, Meerut, India
2. Bhatnagar and Moitra, (1996). Gymnosperms. New age International Publishers, New Delhi.
3. Johri , RM, Lata S , Tyagi K (2005), A text book of Gymnosperms , Dominate pub and Distributer, New Delhi
4. Biswas, C. and Johri, B.M. (2004). The Gymnosperms. Narosa Publishing House, New Delhi.
5. 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.

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

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

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

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

PALEOBOTANY Reference Books

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

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

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

4. 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

1. Dubey, R.C., (2001). A text book of biotechnology. S. Chand & Co., New Delhi.
2. Gupta, P.K. (1994). Elements of Biotechnology. Rastogi Publications, Meerut.

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

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

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

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

Reference Books

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

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

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

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

5. 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, Ayervedha 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

1. John Jothi Prakash, E. (2003). Medicinal Botany and Pharmacognosy. JPR Publication, Vallioor, Tirunelveli.
2. Gokhale, SB., Kokate, CK. and Purohit, AP (1995). Pharmacognosy. Nirali Prakashan, Pune.
3. Prajapathi, Purohit, Sharma and Kumar. (2003). A Hand book of Medicinal plants. Agrobios Publications, Jodhpur.
4. Kumar,NC (1993). An Introduction to Medical Botany and Pharmacognosy

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

Reference Book

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

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

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

4. Kirthikar and Basu.(2012) Indian Medicinal Plants

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

6. 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, Caesalpiniaceae 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: Apocyanceae, Asclepiadaceae, Verbenaceae , Lamiaceae, Euphorbiaceae, Orchidaceae, Liliaceae, Poaceae.

PRACTICAL **3hrs / Week**

1. Describe the plant parts with suitable plants- Technical term habit, habitat form, types of leaves, with leaf shape, margin, texture, modification of leaf.
2. Study the Types and modification of root and stem with suitable example Identify the following inflorescence and fruits:

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

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

3. Floral formula from floral description.

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

5. 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

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

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

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

Text Book

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

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

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

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

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

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

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

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

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

10. Gurcharan Singh ( ) Plants Systematics 3 edition

Reference books

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

2. Gamble,J.S , Fisher,L.E.F .(1967). The Flora of The presidency of madras (Vol-III) BSI, Calcutta

3. Davis , P.H and Heywood ,V.M. (1965). Principles of Angiosperm Taxonomy, Oliver and Boyd Edinburgh

4. Simpson M.G.(2006). Plant systematics, Elsevier Academic Press,USA

5. Takhtajan, A.L. (1969). Flowering Plants – Origin and dispersal – Oliver & Boyed

6. Gangulee H.C ., Das ,K.S and Datta C.T (1964) college Botany –Vol I , basant Panchami ,Calcutta

7. Narayanaswamy R.V and Rao ,K.N (1976) . Outline of botany . S .Viswanthan printer and publisher ,Chennai

8. Heywood V.H. 1967. Plant Taxonomy. London: Edward Arnold.

9. Hill A.F. 1982. Economic Botany.: Mc Graw Hill ,New York.

10. Jain S.K. and Rao R.R. 1976. A hand book of field and herbarium technique. Today and tomorrow's Publishers, New Delhi.

11. Jeffery C. (1968) An Introduction to Plant Taxonomy, J and A Churchill. London.

12. Naik V.N. (1984) Taxonomy of angiosperms. Tata Mc Graw- Hill Publishing Company, New Delhi.

13. 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**

1. To observe the plant cell structure with onion epidermal peel out.
2. Study of the photomicrographs of cell organelles
3. Microscopic view of cell organelles in plant cells – Chloroplast (Hydrila leaf)
4. Starch grains (Potato), Aleurone grains (wheat), Inulin Crystals(potato), Raphides (Petiole –Colacasia /Nymphaea) and Cystoliths –(leaf peel out -Ficus/Momordica).
5. Study the polytene and lamp brush chromosome structure through photograph
6. Identification of different stages of mitosis by using squash and smear techniques –Onion Root tip.
8. Simple problems of monohybrid and Dihybrid ratios and factor interaction
9. Construction of chromosome map – three point test cross

Text Book

1. Rastogi, SC (1992) .Cell biology , Tata McGrew-Hill,New Delhi
2. Sundararajan ,S (2000). Cytology , Anmol publication (P) ltd, New Delhi
3. Gupta, PK.(2002).Genetics.Rastogi publishers,Meerut
4. Meyyan RP (2000) genetics , Saras Publication ,Nagercoil

Reference book

1. Strickberger,M.W(1999).Genetics.Prentice Hall of India Pvt Ltd.New Delhi
2. Singh.B.D (2000).Fundamentals of Genetics.Kalyani Publishers, NewDelhi
3. Mirta,S (1994).Genetics- A Blue print of life.Tata McGraw Hill, New Delhi
4. Dyansager,V.R (1986.Cytology and Genetics.Tata McGrew-Hill,New Delhi.
5. Karp,G (1995)Cell and Molecular Biology,John Wiley and Sons,New York
6. Lewin (2007). Gene IX. Jones and Barlett Pub. ISBN. O 7637 5222 3
7. 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**

1. Parts of microscope and its operation
2. Measurement of Microscopic objects using Micrometer
3. Demonstrate the counting of Spore /Miro algae by using Haemocytometer

4. Familiarize stains, fixatives and mounting media
5. Demonstrate the Preparation of specimen and sectioning using microtome
6. Chromotography –Separation of pigments - TLC,
7. Demonstration of the working of different kinds of centrifuges
8. Determination of the concentration of a sample solution using colorimeter/ Spectrophotometer
9. Measure the pH in different water sample using pH meter
10. Study of blotting techniques: Southern, Northern and Western, through photographs.
11. Work out the problems related to mean, median, mode, standard deviation.

Text Book

1. Patki L.R, Bhalchandra B.L, Jeevaji I.H.(1987). An introduction to Microtechnique, S.Chand and company (Pvt)ltd, New Delhi
2. 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
4. Palanivelu P (2013). Analytical Biochemistry and Separtion techniques , 20th century publications ,Palkalai nage ,Madurai
5. Khan, I.A., and Khannum, A., (1994).Fundamentals of Biostatistics, Vikas Pub., Hyderabad
6. Sundar Rao P.S.S and Richard J(2011) introduction to Biostatistics and research methods , PHI learning private Ltd., New delhi

References Books

1. Johansen, DA (1940). Plant Microtechnique, TATA McGraw Hill Book Co., Ins., New Delhi.
2. Peter Gray (1964). Hand book of Basic Microtechnique. McGraw hill publication ,New York
3. Cooper.TG (1991).The Tools of Bio - chemistry, John Wiley & sons, London
4. Dey P.M. and Harborne, JB (2000). Plant Biochemistry Harcourt Asia Pvt. Ltd.
5. Plummer DT (2003).An introduction to practical Biochemistry. 3rd Edn. Tata McGraw Hill Publishing Company Ltd. New Delhi

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

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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 bioltechnology – 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 :

1. Kumaresan, V(2009) .Biotechnology", Saras Publications, Nagercoil,
2. Dubey, RC (2004)A text book of Biotechnology"3rd Edition , S.Chand & Company Ltd, New Delhi.

3. 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.

5. Razdan, MK (2008) Introduction to plant tissue culture" ,2nd edition Oxford & IBH publishing Co. Pvt. Ltd., New Delhi.

Reference Book

1. Brown TA (2006) gene cloning and DNA analysis ; Blackwell scientific publishers

2. Prime rose SB, Twyman RM & old RW (2001) .principle of gene manipulation; an Introduction to genetic engineering. 6th Ed Blackwell oxford

3. Wilson K & walker J (2008) principle and techniques of Biochemistry an dmolecular Biology . Cambridge university Press.

4. Smith JE(2005) Biotechnology , Cambridge university press, UK.

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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 N_2 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

1. Dubey, RC (2005).Text book of Biotechnology S.Chand & Co, New Delhi.
2. Kumaresan, V(2005). Biotechnology, Saras Publications, New Delhi.
3. John Jothi Prakash, E (2004) .Outlines of Plant Biotechnology. Emkay Publication, New Delhi.
4. Sathe, TV (2004) Vermiculture and Organic Farming. Daya publishers.
5. Subha Rao, NS (2000). Soil Microbiology, Oxford & IBH Publishers, New Delhi.
6. 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

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

Reference Books

1. Allard, R.W. 1960, Principles of Plant Breeding. John Willey and Sons, Inc.
2. Kachroo, P.1970, Pulse Crops of India. I.C.A.R. New Delhi.
3. Sambamurthy, A.V.S.S. and Subrahmanyam, N.S. 1989. A Text Book of Economic Botany, Wiley Eastern Ltd., New Delhi.
4. Choudhury, B. 1992. Vegetables. National Book Trust, New Delhi.
5. Ranjit Singh, 1992. Fruits. National Book Trust. New Delhi.
6. 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. Photomorphogensis - Phytochrome – photoperiodism. Vernalization. Senescence. Plant movements.

PRACTICAL 3Hrs /Week

1. Determination of DPD by using Rheo leaf /Onion leaf
2. Effect of temperature on Membrane permeability
3. Effect of chemical on Membrane permeability
4. Calculation of stomatal index and stomatal frequency of mesophyte and Xerophyte plant leaf
5. Effect of light on transpiration using Ganong's potometer
6. Separation of plant pigments by paper chromatography.

7. To study the effect of light intensity on Photosynthesis by using Wilmotts bubbler
8. To study the effect of and concentration of CO_2 on Photosynthesis by using Wilmotts bubbler
9. Measurement of rate of respiration in germinating seed using Simple Respiroscope
10. Measurement of rate of respiration in flower buds using Simple Respiroscope

Text Books

1. Pandey, SN and Sinha, BK (2001). Plant Physiology. Third revised edition, Vikas publishing House Pvt. Ltd, New Delhi
2. Devlin, RM (1974). Plant Physiology, Affiliated East West Press Pvt. Ltd
3. Noggle, GR. and Fritz, GJ (1976). Introductory Plant Physiology, Prentice-Hall, India.
4. Jain ,VK (2007).Fundamentals of plant physiology , S. Chand & Compamy ltd, New Delhi.
5. Nobel, PS (1970). Introduction to Biophysical Plant Physiology. W. H. Freeman and Company, San Francisco
6. Verma,V(2008).Text book of plant Physiology, Ane's student edition, Newdelhi
7. Bajracharya, D., (1999). Experiments in Plant Physiology- A Laboratory Manual. Narosa Publishing House, New Delhi.

Reference books

1. Beevers, L (1976). Nitrogen metabolism in plants. William & Sons Ltd. London.
2. Bray, CM (1983). Nitrogen Metabolism in Plants, Longman.
3. Kramer, PJ (1969).Plant and soil water relationship, A ModernSynthesis.
4. Salisbury, F B and Ross, CW (1986). Plant Physiology. Third edition, CBS Publishers and Distributors, New Delhi
5. Levitt (1972). Responses of plants to environmental stress, Academic press, New York.
6. Bidwell RGS (1979). Plant Physiology, Mac Millan Publishing Company. New Delhi.
7. 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. Vegetatational types in Tamil nadu. Hotspots – Endemic distribution, Age and Area Hypothesis. Continental drift theory. Conservation – *In situ* and *Ex situ*.

PRACTICALS **3 Hrs / Week**

1. Study of the morphological and structural adaptation of locally available hydrophytes, Mesophytes, xerophytes to correlate to the particular habitat.
2. Determination of Dissolved oxygen in water
3. The light and dark bottle experiment for primary productivity study in the aquatic Ecosystem

4. Determination of dissolved carbon di oxide in water
5. Study the vegetation types and distribution with maps

Text Books

1. Sharma, P.D (2009). Ecology and Environment, Rastogi Publications.
2. Shukla, R.S. &P.S. Chandel (1991) : Plant Ecology & Soil Science S.Chand & Co., New Delhi
3. Vasishta, P.C, 1979 Plant Ecology, Vishal Publication.
4. Verma, V,A 1981 Text Book of plant Ecology, Emkay Publication.
5. Sharma, J.P.2004 Environmental Studies, Laxmi Publications (P) Ltd. New Delhi.

Reference Books

1. Ambasht R.S., 1978 The Book of Plant Ecology, Students friends Co.
2. Willings W.D.1964 Plants and Ecosystem, Wasworti Publishing Co.
3. Daubenmire R.F,1973 Plant and Environment. John Willey.
4. Gopal, B and Bhardwaj,1979 Elements of Ecology, Vikas Publishing House Pvt. Ltd.
5. Cain, S.A . (1944). Foundations of Plant Geography Harper & Brothers, N.Y.
6. Mani, M.S (1974) : Ecology &Biogeography of India Dr. W. Junk Publishers,he Haque
7. 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 distance. 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

1. Collection and study of diseased plant materials.
2. Study of fungal, bacterial and viral diseases mentioned in the syllabus.
3. Handling of plant protection appliances (Dusters, sprayers, and other appliances.)
4. Preparation of 5 herbarium sheets of Pathology – specimens studied

Text Books

1. Chaudhury and Majid, (1954).Hand Book of plant protection Department of Agriculture, Government press, Shillong, Assam.
2. Agros, GN (1997) Plant Pathology (4th ed) Academic Press.
3. Bilgrami KH. and Dube HC (1976). A textbook of Modern Plant Pathology. International Book Distributing Co. Lucknow.
4. Mehrotra, RS (1980). Plant Pathology – TMH, New Delhi.
5. Pandey, BP. (1999). Plant Pathology. Pathogen and Plant diseases. Chand & Co. New Delhi.
6. Rangaswami, G (1999). Disease of Crop plants of India Prentice Hall of India Pvt. Ltd.
7. Sharma PD(2004). Plant Pathology Rastogi Publishers

Reference

1. Robbins, W Crafts, S, Raynor, N (1952). Weed control McGraw Hill Book Company Inc., New York.
2. Pyenson, L.L (1951). Elements of plant protection. John Wiley and Sons Ltd., Inco, New York.
3. Bap Reddy D, (1968)Plant protection in India, Allied publishers
4. Walker, JC (1957).Plant pathology Me Graw Hill Publishers.
5. 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

1. Rastogi , S.C (2003). Outlines of Biochemistry , CBS Publishers &Distributors , New Delhi
2. Stryer, L., (1988). Biochemistry, WH Freeman & Co., NY.
3. Jain J.L. *et al.,* (2008). Fundamentals of Biochemistry, Chand ,New Delhi
4. Conn E.E, Stumpf , Bruening G, Doi RH.(2005) . Outlines of Biochmistry 5/Ed, Wiley &Sons Pvt . ltd.
5. Satyanaryana U, Chakrapaani U, (2006). Biochemistry, Books and Allied (P)Ltd.

Reference Book

1. Apps *et al*., (1992). Biochemistry, ELBS.
2. Caret et al., (1993). Inorganic, Organic and Biological Chemistry, WMC Brown Pub. USA.
3. Nelson D.L, Cox M.M.(2005). Lehninger Principle of Biochemistry, W.H. freeman and
4. Company, New York
5. Rawn, D. (1989).Biochemistry, Neil Patterson.
6. Zuley G.L., (1998).Biochemistry, Wm. C .Brown Publishers USA.

B. Sc. BOTONY

SEMESTER –VI

SKILL BASED ELCTIVE COURSE –VI

MEDICO- ETHNO BOTANY

UNIT - I **6 Hrs**

History, Scope and Importance of Medicinal Plants. Indigenous Medicinal Sciences - Definition and Scope- Ayurveda, Siddha. Unani- History, concept. classification of natural drugs, (Alphabetical, Morphological, Taxonomical, Chemical and Pharmacological)

UNIT - II **6 Hrs**

Ethnobotany – definition, scope and objectives; Major and minor ethnic groups in South India and their Ethnobotanical and Ethnobiological heritage. Ethnomedicines .

Role of ethnic groups in conservation of plant genetic resources. Endangered taxa and forest management (participatory forest management)-Mythology and conservation of ecosystems, conservation of selected plant species: sacred groves, ethnobotanical field methods

UNIT - III **6 Hrs**

Role of ethnobotany in modern Medicine-Medico-ethnobotanical sources in India; Significance of the following plants in ethnobotanical practices (along with their habitat and morphology) a) *Azadiractha indica* b) *Ocimum sanctum* c) *Vitex negundo*. d) *Gloriosa superba* e) *Tribulus terrestris f*) *Pongamiapinnata* g) *Cassia auriculata* h) *Indigofera tinctoria*. Role of ethnobotany in modernmedicine with special example *Rauvolfia sepentina, Trichopus zeylanicus, Artemisia, Withania*.

UNIT - IV **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 - V **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, Drug evaluation: Chemical and Biological. Phytochemical investigations. Quality control of herbal drugs. Role of NMPB, AYUSH and CDRI.

Text Books

1. Gokhale, SB., Kokate, C.K. and Purohit, AP (2003). Pharmacognosy. Nirali Prakashan, Pune.

2. Arumugam, K.R. and Murugesh, N (1990). Text book of Pharmacognosy. Sathya Publishers, Chinnalapatti (Tamilnadu) 624 201.

Reference

1. Amruth, (1996) The Medicinal plants Magazine (All volumes) Medcinal plant Conservatory Society, Bangalore.

2. Bhattacharjee, S.K. 2004. Hand Book of Medicinal plants. Pointer Publishers, Jaipur.

3. Handa, S. S. and V. K. Kapoor, (1993). Pharmacognosy. Vallabh Prakashan, New Delhi.

4. Harbourne, J. B. (1998). Phytochemical methods : A Guide to Modern Techniques of Plant Analysis (3rdedition). Chapman and Hill Co., New York.

5. Jain, (2001). Medicinal plants. National Book Trust, New Delhi.

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:

1. Agarwal, R.L. Seed Technology Oxford and IBH Publishing Co. Pvt. Ltd.,
2. Bewley J.D. and Black M (Edn) 1985 – Seed Physiology of development and germination, Plenum Press, New York.
3. Kowslowsky. 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 *Lycopdium* 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

1. Fuller HJ and Trippo O (1949) College Botany, Henry Holt & Co.
2. Ganguly AK (1975) General Botany Vol I (1971) &Vol II, The New Book Stall, Calcutta.
3. Rao, K.. Krishnamurthy, KV and Rao GS (1979) Ancillary Botany,S. Viswanathan Pvt. Ltd., Madras.
4. Palaniappan, S. (1985) ThavaraviyalThunaippaadam (Tamil), Mohan Padippagam, Chennai.
5. Pandey B.P, 1986, Text Book of Botany (College Botany) Vol I and II, S.Chand and Co. New Delhi.
6. 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

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

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

    1. *Arachis hypogea* - Ground nut
    2. *Dolichos biflorus* - Horse gram
    3. *Cicer arietinum* - Bengal gram
    4. *Pisum sativum* - Pea
    5. *Phaseolus mungo* – Black gram
    6. Phaseolus radiatus – Green gram
    7. *Tamarindus indica* - Fruit
    8. *Abrus precatorius* - Seed
    9. *Acacia concinna* – Soap nut
    10. *Luffa aegyptiaca* -Fibrous skeleton of the fruit
    11. *Cucumis sativus* - Fruit
    12. *Coffea arabica* - Seeds
    13. *Ixora* - Flower
    14. *Cinchona officinalis* - Plant
    15. *Musa Paradisica* – Fruit
    16. *Phoenix sylvestris*-Date fruit
    17. *Areca catechu*-Nut
    18. *Cocos nucifera*-Kernal

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

4. 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.

1. Palmelloid form
2. SCP
3. Heterocyst
4. Gliding movement
5. Globule
6. Floridean Starch
7. Elater
8. Trabeculae
9. Calyptra
10. 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

b) Briefly describe the pigmentation in algae

12. a) Describe the Ultra structure of *Chlamydomonas.*

Or

b) List out the prokaryotic characters in Cyanobacteria

13. a) Briefly describe the structure of Chara sex organs

Or

b) Explain the structure of Receptacles in *Sargassum*

14. a) Describe the sporophyte structure of *Marchantia*

Or

b) 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.

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

17. Give an account of sexual reproduction in *Oedogonium*

18. Briefly explain the post fertilization changes in Polysiphonia

19. Write an essay on classification of Bryophytes by Rothmaler

20. Describe the development of Sporangium and structure of mature sporangium in *Porell*a.

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**

1. Hypha
2. Condium
3. Budding
4. Heterokaryosis
5. Uredinispores
6. Diploidization
7. Isidia
8. 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.

9. Incipient nucleus
10. 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

11. a) Write a note on the ultra-structure of fungal cell

Or

b) Give an account of the useful aspects of Fungi.

12. a) Describe the structure and asexual reproduction in Albugo.

Or

b) Describe structure and reproduction in Peziza

13. a) Give an account the structure and life cycle of Puccinia

Or

b) Write a brief note on *Cercospora*

14. a) Write short notes on economic importance of Lichens.

Or

b) Give short notes on Cyanophages

15. a) Write about Nutrition in Bacteria.

Or

b) 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.

16. Write an essay on classification of Fungi by Alexopoulos and Mims

17. Write an essay on the structure and reproduction in *Albugo*

18. Write about the structure and formation fruiting body of *Polyporus.*

19. Diagrammatically describe the structure and Reproduction of T4 phage

20. 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

1. Define mushroom.
2. Write the common name of *Pleurotus citrinopileatus* .
3. What are edible mushrooms?
4. What is mother spawn?
5. Define sterilization.
6. What is oatmeal agar medium?
7. What is mushroom bed?
8. List out materials used for mushroom cultivation.
9. Write the name of any two medicinal mushroom names and its application.
10. 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

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

Or

b) Write notes on scope of edible mushroom cultivation.

12. a) Describe the methods of sterilization.

Or

b) Write about the preparation of PDA medium.

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

Or

b) List out the material required for mushroom cultivation.

14. a) List out the nutritional value of edible mushroom.

Or

b) What is short term and long term storage?

15. a) List out the application of mushroom cultivation

Or

b) 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

16. Explain briefly about *Pleurotus citrinopileatus*.

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

18. Discuss in detail about mushroom cultivation in polythene bags.

19. Explain preparation of mushroom soup and cutlet.

20. 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

1. Procambium
2. Collenchyma
3. Vessels
4. Tyloses
5. Phellogen
6. Heart wood
7. Pollen kit
8. Polar nuclei
9. Endosprem
10. 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

11. a) Write in detail about quiescent center in plant root

Or

b) Describe the Tunica carpus theory

12. a) Give a short account on Annual rings or growth ring

Or

b) Diagrammatically describe the structure of lenticels

13. a) Describe the primary structure of Dicot stem

Or

b) Distinguish the internal structure of dicot root from monocot root

14. a) Describe the T.S of mature Anther

Or

b) Write short notes on types of ovules

15. a) Give short notes on nuclear endosperm

Or

b) 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

16. Write essay on structure and function of Scelerids

17. Describe the different types of meristem and their function

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

19. Write an essay on development of male gametophytes

20. 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

1. Scope of horticulture
2. Formal garden
3. Layering
4. Grafting
5. Types of grasses
6. Pruning
7. Floriculture
8. Ikebane
9. Green house
10. Bonsai techniques

PART B

(5 x 5 = 25 mraks) 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). Give an account about Importance of horticulture

Or

b) Classify the horticulture crops.

12. a) What is budding? Briefly explain the methods of budding

Or

b) Briefly explain the growth regulators.

13. a) Write notes on weeding.

Or

b) Briefly explain the cultivation of Rose.

14. a) How will you make dry flowers? Comment on its uses

Or

b) Discuss the maintenance of nursery.

15. a) Write notes on water gardens

Or

b) 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.

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

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

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

19. Describe the cultivation methods of commercial flowers with two examples.

20. 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.

1. Define mushroom.
2. Write the common name of *Pleurotus citrinopileatus* .
3. What are edible mushrooms?
4. What is mother spawn?
5. Define sterilization.
6. What is oatmeal agar medium?
7. What is mushroom bed?
8. List out materials used for mushroom cultivation.
9. Write the name of any two medicinal mushroom names and its application.
10. 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

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

Or

b) Write notes on scope of edible mushroom cultivation.

12. a) Describe the methods of sterilization.

Or

b) Write about the preparation of PDA medium.

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

Or

b) List out the material required for mushroom cultivation.

14. a) Discuss the nutritional value of edible mushroom.

Or

b) What is short term and long term storage?

15. a) List out the application of mushroom cultivation

Or

b) 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

16. Explain briefly about *Pleurotus citrinopileatus*.

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

18. Discuss in detail about mushroom cultivation in polythene bags.

19. Explain preparation of mushroom soup and cutlet.

20. 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

1. Actinostele.
2. What is apospory?
3. Ligule.
4. Vallecular canal
5. Sporocarp
6. Ramenta
7. Sago
8. Sulfur rain
9. How will you name a fossil plant?
10. 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

11. a) Bring out the salient features of Pteridophytes.

Or

b) "Pteridophytes are widely used as ornamental plants " comment.

12. a) Describe the various types of Steles in *Lycopodium.*

Or

b) Give an illustrate account of the Spore –producing organ of *Equisetum*

13. a) Describe the Sorus in *Adiantum*.

Or

b) Write a short notes on anatomy of *Gleichenia* Stem

14. a) Describe the structure *Pinus* ovule

Or

b) Why "Cycads are living fossils" ? Justify

15. a) List out that Angiosperm Character in *Gnetum*

Or

b) 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.

16. Write an essay on Heterospory and Seed habit

17. Describe morphological features of *Selaginella* sporophyte

18. Explain the male gametophyte in *Cycas*

19. Write an essay on Economical importance of Gymnosperm

20. Write a detail account of *Williamsonia* with suitable diagram

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(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

1. Haberlandt
2. Totipoteny
3. IAA
4. PVP
5. Callus
6. Turbidostats
7. Sodium Alginate
8. Liquid nitrogen
9. Erythrorhizon
10. 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

11. a) Write an account on the sterilization techniques.

Or

b) Discuss the history and development of plant tissue culture

12. a) Give an account on plant growth regulator used in plant tissue culture

Or

b) How do you select explant? Explain

13. a) Write a short notes on importance of organ culture

Or

b) Give a general account of cell suspension culture

14. a) Write short notes on somatic hybridization.

Or

b) Describe the isolation of plant protoplast

15. a) Write short notes on clonal propagation

Or

b) 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

16. Give an outline of a plant tissue culture laboratory

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

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

19. What is somatic embryogenesis? Discuss the principle of Somatic embryogenesis

20. Discuss the importance of Plant tissue culture in plant pathology.

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(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

1. Materia Medica
2. Ayurveda
3. Ephedrin
4. Vincristine
5. Andrographolide,
6. *Aloe vera* uses
7. Psychoactive drug
8. Nux vomica
9. Cardio vascular drugs
10. 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.

11. a) Give a Brief account on siddha

Or

b) Write a short note on Unani.

12. a) Give an account on phytochemistry of *Ginger*

Or

b) Give an account of pharmaceutical importance of *Vinca rosea*.

13. a) Brief account on therapeutic uses of *Aloe vera*.

Or

b) Give brief account on the utility value of *Bacopa monnieri*

14. a) How will you cure the gastrointestinal disorders by using plant drugs

15 a) Briefly explain Drying of crude drugs

Or

b) 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

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

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

18. Write down the cultivation and utilization of *Andrographis paniculata*

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

20. Write an essay of drug Adulteration.

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(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**.**

1. Cladode
2. Compound leaf
3. Hypothodium
4. Drupe
5. Linnaeus
6. Holotype
7. Obdiplostemonous
9. Binomial of Clove
10. 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

11. a) Write a short account on Modifications of tap root.

Or

b) Discuss the any four types of stipules.

12. a) Explain Head inflorescence.

Or

b) Give a brief account on placentation

13. a) Give a short account on Author citation

Or

b) Briefly discuss the APG III system of classification

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

Or

b) Discuss the Types of androecium in *Cucurbitaceae.*

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

Or

b) 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.

16. Give an account of Aerial stem modifications.

17. Enumerate the types of Racemose inflorescence and explain.

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

19. Write an essay on Economic importance of *Apiacea*e with suitable example

20. Write about the family *Poaceae.*

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(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.

1. Robert brown
2. Semiautonomous organelle
3. Histone
4. Synaptonemal complex
5. Testcross
6. What is phenotype?
7. Define Crossing over.
8. What is linkage?
9. Define nullisomic.
10. 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.

11. a) Explain the fluid mosaic model of plasma membrane

Or

b) Describe the ultrastructure of Mitochondria

12. a) Write short notes on lampbrush chromosome

Or

b) Write a brief account on double helix structure of DNA.

13. a) Discus the Mendel's law.

Or

b) What do you know about epistasis?

14. a) What is crossing over? Explain its significance.

Or

b) Explain cytoplasmic inheritance with an example.

15. a) Describe briefly on the types of polyploidy.

Or

b) 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.

16. Write an account on the structure and function of nucleus.

17. Explain the Mitotic cell division with suitable illustration

18. Write an essay on Multiple alleles

19. Discuss the cytoplasmic inheritance with suitable example.

20. Discuses Hardy –Weinberg law, using a hypothetical example of two alleles Locus

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(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.

1. Resolving power
2. Stage micrometry
3. FAA
5. Dehydration
6. Rpm
7. SDS
8. Beer lambert law
9. Standard deviation
10. 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

11. a) Give a short account on compound microscope

Or

b) Describe a phase contrast microscope and its functioning

12. a) Give an account of chemical fixative mixtures

Or

b) Describe the method of embedding specimens in paraffin wax.

13. a) Write short note on types of rotors in centrifuge

Or

b) Explain the thin layer chromatography

14. a) Discuss the structure and function of combine pH electrode

Or

b) Write short note on principle of colorimetry

15. a) What are the advantages of arithematic mean over median

Or

b) 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.

16. Describe the components and functioning of a transmission Electron Microscope

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

18. Explain the basic principle involved in separation of protein by Electrophoresis

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

20. 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

1. Shuttle vector
2. Define restriction endonuclease
3. Lipofection
4. Octopine
5. Taq polymerase
6. RAPD
7. Golden rice
8. Flavr savr
9. SCP
10. 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

11. a) Write an account on History and development of biotechnology

Or

b) Write short notes on enzymes used in recombinant DNA technology.

12. a) Explain the microinjection

Or

b) Diagrammatically describe the structure Ri plasmid

13. a) Write short notes on DNA fingerprinting

Or

b) Discuss the DNA sequence analysis

14. a) Write about Antisense RNA technology

Or

b) How is genetic engineering used to create bacteria capable of producing human insulin?

15. a) What are the biological agents used in hazardous waste management?

Or

b) 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.

16. Write an essay cloning vectors used in Recombinant DNA technology

17. Write an account on *Agrobacterium* mediated gene transfer

18. Explain the procedure for DNA amplification using PCR.

19. Write an essay on Hybridoma technology and its application

20. 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.

1. Rhizosphere
2. Nitrogen fixation
3. Leghemoglobin
4. YEMA medium
5. Azolla
6. Nitrogense enzyme
7. Inoculant
8. Mycorhiza
9. Green manure
10. 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

11. a) explin the role of rhizosphere mircogranism in imorpving the soil fertility

Or

b) What are major contribution of phosphate solubilizing bacteria in plant functioning

12. a) Discuss the methods of inoculum production of Rhizobium

Or

b) Discuss the field application method of *Azospirillum*

13. a) Give the steps of mass cultivation of *Anabaena azollae*

Or

b) Explain the role of cyanobacteria in agriculture

14. a) Explain the morphology of AM

Or

b) Discuss the types of Mycorrhiza association

15. a) What is the significance of organic farming ?

Or

b) 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.

16. Write essay on Agriculture important soil microflora

17. Give a detailed account of mass cultivation of *Azospirillum*

18. Explain the procedure for large scale production of algal flakes.

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

20. Write essay on the method of preparation of vermicopost.

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(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.

1. Plant introduction
2. Pure line
3. Hybrid vigour
4. Polyploidy
5. Binomial of foxtail millet
6. Mention any two variety of *Cajanua cajan*
7. Coconut oil
8. Carpophore
9. Organic acid in papaya
10. 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

11. a) Write short notes on Domestication of plants

Or

b) Give a detailed account on origin for cultivated plant

12. a) Discuss the various types of hybridization

Or

b) Write short notes on Aneuploidy breeding

13. a) Give a detailed account on cultivation of Rice

Or

b) List out any five pulses variety with nutritive content

14. a) Discuss the byproduct of sugar industry

Or

b) Write short notes on important of Ground nut oil

15. a) Give a detailed account general properties of fruits

Or

b) 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.

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

17. Write an essay on mutation breeding and its potential and limitation

18. Describe origin, distribution and cultivation of Red gram

19. Classify the vegetable fatty oil and their uses

20. Write a detailed account on cultivation and uses of Papaya

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(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**.**

1. Osmosis.
2. Trace elements.
3. Quantosomes
4. Emerson enhancement effect.
5. Fermentation.
6. ATP and NADP
7. Transamination.
8. Proline .
9. Phototropism.
10. 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

11. a) Explain the Active absorption

Or

b) Give the role of macro elements.

12. a) Discus the CAM pathway

Or

b) Write notes on the factors affecting photosynthesis.

13. a) Describe the glycolysis

Or

b) Explain oxidation phosphorylation.

14. a) Give short notes on nitrification

Or

b) Explain the water stress

15. a) Define nastic movements. Briefly explain seismonastic movement

Or

b) 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**.**

16. Explain the mechanism of Stomatal movement.

17. Describe the calvin cycle.

18. Explain the process of Krebs cycle

19. Write an essay on Nitrate assimilation

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

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(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

1. Rainfall
2. Autecology
3. Primary productivity
4. Autotrophs
5. Migration
6. Colonization
7. BOD
8. Acid rain
9. Hotspots
10. 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

11. a) Write briefly about the effect of wind on plants.

Or

b) Define thermoperiodism.

12. a) How grazing by animals influence vegetation?

Or

b) Illustrate the pyramid of biomass.

13. a) Explain the Hydrarch succession

Or

b) Describe the character feature of Hydrophytes

14. a) Describe about soil pollution.

Or

b) Give short notes on e-waste

15. a) What is evergreen forest? Give examples.

Or

b) 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**.**

16. Give an account of the effects of temperature on plants.

17. Write an essay on pond Ecosystem

18. Explain the adaptations of Xerophytes.

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

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

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

SEMESTER –VI

CORE COURSE – XIII

PLANT PROTECTION

Time : 3 Hrs. **Maximum : 75 marks**

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

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

1. Any two disease causing fungi
2. Nematodes
3. Quarantine
4. Endemic disease
5. Damping off
6. Smut disease
7. Canker
8. Rot disease
9. TMV
10. 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

11. a) Explain the symptoms cause by fungi

Or

b) Briefly explain the loss incurred by rodent pests in India

12. a) Explain the role of Quarantine is protection

Or

b) Write short notes on Seed certification

13. a) Give a brief account on Bud rot of coconut.

Or

b) Write short notes on Tikka disease of ground nut

14. a) Explain the important symptoms seen in bacterial disease

Or

b) What are the symptoms seen in ring rot of Potato in field condition. Illustrate

15. a) Explain the spreads and symptoms cause by Bunchy top of banana.

Or

b) 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.

16. Why have more pest problem arisen in recent years a s compared to the pest

17. Give a brief account about weed control

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

19. Explain citrus canker disease and its control measures.

20. Give an account of Tobacco mosaic disease.

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(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

1. Van der Waals forces
2. Define acid
3. Monosaccharide
4. Mutarotation
5. Peptide bond
6. Structure of glycine
7. Co-factor
8. Oxidative enzyme
9. Define saturated fatty acid
10. 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

11. a) Describe the structure of water molecule

Or

b) Discuss pH and its significance

12. a) Describe the Structure and importance of sucrose

Or

b) Explain the Reducing property of carbohydrates

13. a) Write short notes on Amphoteric property of protein

Or

b) List out Essential and non-essential amino acids

14. a) Discuss the factor affecting enzyme action

Or

b) Describe important properties of enzymes

15. a) Write a brief account on Biological significance of lipid

Or

b) 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.

16. What are buffer s/ elucidate their role in biological system

17. Describe the structures and functions of cellulose

18. Describe the structure of protein

19. How are enzyme classify? Add a note on mechanism of enzyme action

20. 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 - VI

MEDICO – ETHANOBOTANY

Time: 3 Hrs. **Maximum: 75 marks**

PART A

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

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

1. Materia Medica
2. Ayurveda
3. Tribal medicine
4. Sacred groves
5. Reserpine
6. *Artemisia*
7. *Syzygium aromaticum*
8. *Aloe vera* use
9. AYUSH
10. Biomedicine

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.

11. a) Give a Brief account on siddha

Or

b) Write a short note on Unani.

12. a) Brief account on therapeutic uses of *Strychnos nux vomica*

Or

b) Give an account of pharmaceutical importance of *Gymnema sylvestre*

13. a) Define ethnobotany. What is its significance?
Give and example for successful Exploitation of ethnobotany

Or

b) Give brief account on Participatory forest management

14. a) Give brief account on Ethano medicine prepared from *Glorisa superba*

Or

b) What are the medicinal uses of *Cassia auriculata*

15. a) Briefly explain Drying of crude drugs.

Or

b) 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

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

17. Discuss the method of extraction and uses drugs from *Andrographis panicualata*

18. Write an essay on South Indian Tribes.

19. Write down the cultivation, collection and natural drug preparation of *Rauwolfia serpentine*

20. 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 –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

1. Define cross pollination
2. Structure of Monocot seed
3. Seed vigor
4. Seed dormancy
5. G.Cot DH 7
6. Grow out test
7. Roguing
8. Define seed rate
9. Supplementary pollination
10. 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

11. a) Mention the characters of quality of seed

Or

b) Write short notes on isolation of seed crops.

12. a) What are the requirements for germination tests?

Or

b) Give an account on seed dormancy and breaking methods

13. a) Give an account on seed viability test

Or

b) How would you test moisture content of a seed?

14. a) Write a Rules and regulations guiding the production of paddy seed

Or

b) Seed Standard for Certified Hybrid cotton seed

15. a) Explain the different methods of seed drying.

Or

b) 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.

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

17. Write an essay on Different types of seed germination

18. Briefly write about the certified seed production of groundnut

19. Give an account on the seed vigor and its importance.

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

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

1. Hormogone
2. Capcells
3. Capsomere
4. Basidiocarp of Agaricus
5. Protonema
6. Protocorm
7. Auxin
8. Osmosis
9. Commensalism
10. 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

b) Describe the vegetative reproduction in *Oscillatoria.*

12. a) Economic importance of Fungi

Or

b) Asexual reproduction in *Albugo.*

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

Or

b) Explain the Coralloid root of *Cycas.*

14. a) Describe the absorption of H_2O

Or

b) Explain Ammonification and Nitrification.

15. a) Describe succulent Xerophytes.

Or

b) 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.

16. Describe the alternation of generation in Ectocarpus.

17. Describe the structure and reproduction in Bacteria.

18. Describe the reproduction in Cycas.

19. Describe Kreb's Cycle.

20. 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

1. Epigynous Flower
2. Define phyllotaxy.
3. What type of inflorescence found in Musaceae?
4. Write note on syngenesious anther.
5. Which part of a cell is called power houses?
6. Write two kinds of endoplasmic reticulum.
7. Define meristem.
8. Name of the cells found in xylem.
9. What is tapetum?
10. 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

11. a) Describe the different types of phyllotaxy

Or

b) Explain the types of leaf

12. a) Write down the economic importance of *Arecaceae.*

Or

b) What are the salient features of *Cucurbitaceae*

13. a) Briefly explain the functions of ribosomes.

Or

b) Describe the incomplete dominance.

14. a) Write short notes on the structure and function of parenchyma.

Or

b) With suitable diagram explain the internal structure of a dicot leaf.

15. a) Write short notes on fertilization.

Or

b) 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.

16. Describe the Racemose inflorescence.

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

18. Write an essay about mitosis.

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

20. 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**

1. 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)
3. 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**

1. Cut transverses 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)
3. Dissect and mount any one of the stages of the given material **E**. (notes not necessary) (4 Marks)
4. Name the genus, group and morphology of given part of **F** and **G**. (2X3=6 marks)
5. Write notes on **H, I, J, K** and **L** . (5X2=10 marks)

KEY

A. 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)

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

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

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

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

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

1. 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)
3. 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)
6. 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
8. 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 Marks1.

1. 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)
2. Based on morphological and anatomical characters, assign, **B** and **C** to their respective probable habitats. Draw suitable diagrams. Submit slides for valuation. 2 x 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)
5. 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 = 2X5=10 marks

D 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
2.	Identify the plant, family and morphology of the parts used for **C, D, E, F** and **G**.	15 mark
3.	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

1.	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