

NAGARJUNA GOVERNMENT COLLEGE

(Autonomous), NALGONDA

(Re accredited by NAAC with 'A' Grade)

BOARD OF STUDIES MEETING - 2019



DEPARTMENT OF BOTANY

B. Sc I, II & III Year (CBCS) Syllabus

2019-2020

NAGARJUNA GOVERNMENT COLLEGE (Autonomous), NALGONDA

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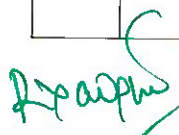
DEPARTMENT OF BOTANY

BOARD OF STUDIES MEETING - 2019

CONSTITUTION OF BOARD OF STUDIES

The Board of studies in the Department of Botany is constituted with the following members for the academic year 2018-19.

S.NO	CATEGORY	NAME & DESIGNATION	ADRESS/MAIL/PHONE
1.	Chairman, Board of Studies	A.Sandhya In- Charge Assistant Professor Department of Botany Nagarjuna Government college, Nalgonda.	Department of Botany Nagarjuna Government College, Nalgonda.
2.	University Nominee	Dr. K. Srinivas Reddy Asst.Prof of Botany	Dept of Botany GDC(w), Nalgonda.
3.	Subject Experts	1.Dr.R. Yadagiri Asst.Prof of Botany 2. N. Siddulu Asst.Prof of Botany	Dept of Botany GDC, Ramannapet, Yadadri. Dept of Botany TARA GDC, Sangareddy.
4.	Faculty members of Department	1. R. Swapna (Contract Lecturer) 2. A. Raju (Contract Lecturer) 3. S. Shankar (Contract Lecturer)	Dept. of Botany Nagarjuna Government College, Nalgonda.



In-Charge/Chairman BOS

Assistant Professor
Department of Botany
Nagarjuna Government College
NALGONDA

Principal/Chairman Academic Council

NAGARJUNA GOVERNMENT COLLEGE (Autonomous), NALGONDA

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(Affiliated to Mahatma Gandhi University)
DEPARTMENT OF BOTANY
BOARD OF STUDIES MEETING – 2019-2020

The Board of studies meeting of Botany Department is held on 26-10-2019 in the Department of Botany to discuss the Agenda and formulated the following resolutions.

Agenda:

1. To consider and approve the new syllabus (CBCS) for I year (I & II Sem) for the academic year 2019-20.
2. To consider and approve the syllabus (CBCS) of B. Sc II and III Year (III, IV, V, & VI semesters).
3. To conduct two internal assessments for 30 marks for each semester (i.e., 20 marks for written examination, 5 marks for Assignment and 5 marks for student seminar) and semester end exam for 70 marks.
4. To approve Elective-1, i.e., "**Ecology and Biodiversity**" for semester-V and Elective-III, i.e., "**Tissue culture and Biotechnology**" for semester-VI for III year Students.
5. To consider the syllabus for Ability Enhancement Compulsory Course (AECC) for I semester and Skill Enhancement Course (SEC) for Final year (V & VI semesters). And GE for VI Semester.
6. To consider and approve the model question papers for B. Sc all semesters.
7. To consider and approve the list of Panel of examiners for paper setting and evaluation.
8. To consider and approve to conduct practical exams semester wise for All the year Students for 50 marks for each paper.
9. Any other related academic matters.

Resolutions:

1. It is resolved to approve the new syllabus (CBCS) for I year (I & II Sem) for the academic year 2019-20.
2. It is resolved to approve the syllabus of B.sc II and III Year (III, IV, V, & VI semesters).
3. It is resolved to conduct two internal assessments for 30 marks for each semester (i.e., 20 marks for written examination, 5 marks for Assignment and 5 marks for student seminar) and semester end exam for 70 marks.
4. It is resolved to approve Elective-1, i.e., "**Ecology and Biodiversity**" for semester-V and Elective-III, i.e., "**Tissue culture and Biotechnology**" for semester-VI in III year course.
5. It is resolved to approve the syllabus for the courses of AECC for I Sem & SEC for V & VI Semesters and GE for VI Semester.
6. Approved the model question papers for B. Sc all semesters.
7. Approved the Panel of examiners for paper setting and evaluation.
8. Approved to conduct practical exams semester wise for All the year students for 50 marks for each paper.

Members Present:

1. Dr. A. Sandhya
Chairman, Board of Studies,
Dept of Botany, Nagarjuna Government College,
Nalgonda.

2. Dr. K. Srinivas Reddy
Asst. Prof of Botany
Department of Botany
GDC(W), Nalgonda.

3. Dr. R. Yadagiri
Asst. Prof of Botany
Department of Botany
GDC, Ramannapet, Yadadri.

4. N. Siddulu
Asst. Prof of Botany
Department of Botany
TARA GDC, Sangareddy.


5. Members from the Department:


1. R. Swapna (contract)

2. A. Raju (contract)

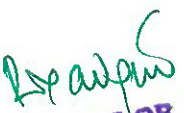
3. S. Shankar (contract)


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 (S. Shankar)

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DEPARTMENT OF BOTANY

BOARD OF STUDIES MEETING - 2019

Paper setters and Panel of examiners for the academic year 2019-2020

S. No	Subject/ Paper	S. No	Name/Designation/Working address/mobile. No/email.ID	Residential Address
1.	I	1	P. Suresh Babu , Asst. Prof of Botany GDC, Kukatpally. Mobile No:9440394036 Email ID:sureshbtm@gmail.com	H. No: 4-21, East part phase-II Chaitanya Nagar, B.N Reddy Nagar, Hyderabad.
2		2	Dr. R. Yadagiri , Asst.Prof of Botany GDC,Ramannapet Mobile No: 9948649049 Email ID: yadagiri101010@gmail.com	Village: Gundrampally MDL : Chityala Dist : Nalgonda. Pin : 508114
3		3	Dr.Ch. RamaRaju , Asst. Prof of Botany, MKR GDC Devarakonda. Mobile No: 9948236946 Email ID : praveenaramaraju@gmail.com	H.NO: 5-8-334 North Sagar Housing Complex Vanastalipurnam Hyderabad - 500070
		4	Dr. O. Padmaja Asst. Prof of Botany, TARA GDC, Sangareddy. Mobile No: 8686030005 Email ID: Munny.odela@gmail.com	H.No : 6 – 33/5, PLOT NO 19 Vayushakti Nagar Dammaiguda, Secunderabad.
4	II	1	Dr. K. Srinivas Reddy Asst. Prof of Botany GDC (W), Nalgonda. Mobile No:7396667598 Email ID: kotanivas@gmail.com	Flat No.205, A-block, K.S. Enclave, Bhavani Nagar, Kodad.PIN-508206
5		2	N. Siddulu Asst. Prof of Botany TARA GDC, Sangareddy. Mobile No:9133468688 Email ID: siddubot@gmail.com	Village: Vartoor Mdl : Alair Dist : Yadadri.

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		3	S. Veeraiah, Asst. Prof of Botany, GDC(W), Nalgonda. Mobile No: Email ID: veeru6345@gmail.com	H. No: 6-2- 931, Mirbag Colony, Nalgond - 508001
6	III	1	D. Srihari Reddy Asst. Prof of Botany GDC, Patancheru, Hyd. Mobile No: 9441564471 Email ID: devarrintisriharireddy5@gmail.com	Plot. No. 12 II Floor Near Nagarjuna School Street No. 1 Srinivasapuram, NGO's Colony Vanasthalipuram, Hyd-500070.
7		2	Dr. R. Yadagiri, Asst.Prof of Botany GDC,Ramannapet Mobile No: 9948649049 Email ID: yadagiri101010@gmail.com	Village: Gundrampally MDL : Chityala Dist : Nalgonda. Pin : 508114
8		3	P. Suresh Babu, Asst. Prof of Botany GDC, Ibrahimpatnam. Mobile No: 9440394036 Email ID:sureshbtm@gmail.com	H. No: 4-21, East part phase-II Chaitanya Nagar, B.N Reddy Nagar, Hyderabad.
		4	Dr.Ch. RamaRaju, Asst. Prof of Botany, MKR GDC Devarakonda. Mobile No: 9948236946 Email ID : praveenaramaraju@gmail.com	H.NO: 5-8-334 North Sagar Housing Complex Vanastalipurnam Hyderabad - 500070
9	IV	1	S. Veeraiah, Asst. Prof of Botany, GDC(W), Nalgonda. Mobile No: Email ID: veeru6345@gmail.com	H. No: 6-2- 931, Mirbag Colony, Nalgond - 508001
10		2	Dr. O. Padmaja Asst. Prof of Botany, TARA GDC, Sangareddy. Mobile No: 8686030005 Email ID: Munny.odela@gmail.com	H.No : 6 – 33/5, PLOT NO 19 Vayushakti Nagar Dammaiguda, Secunderabad.

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11	3	Dr. K. Srinivas Reddy Asst. Prof of Botany GDC (W), Nalgonda. Mobile No:7396667598 Email ID: kotanivas@gmail.com	Flat No.205, A-block, K.S. Enclave, Bhavani Nagar, Kodad.PIN-508206
12	4	N. Siddulu Asst. Prof. of Botany GDC, Tara College, Sanga Reddy Mobile No: 9133468688 Email ID: siddubot@gmail.com	Village: Vartoor Mdl : Alair Dist : Yadadri.

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N. Siddulu

**Proposed
B.Sc. Botany Syllabus**

Under Choice Based Credit System

2019-20

**Meeting held with Heads & Chairperson,
BOS of Six Conventional Universities
on 15th June, 2019 at TSCHE-Hyderabad.**

Approved

TELANGANA STATE COUNCIL OF HIGHER EDUCATION
PROPOSED CBCS COMMON CORE SCHEME FOR B.SC. COURSE
OPTIONAL -1: BOTANY

CODE	PAPER TITLE	Course Type	HPW	Credits
FIRST YEAR SEMESTER - I				
BS 104	PAPER-I : Microbial Diversity and Lower Plants	DSC-1A	4T+2P=6	4+1=5
FIRST YEAR SEMESTER - II				
BS 204	PAPER-II: Gymnosperms, Taxonomy of Angiosperms and Ecology	DSC-1B	4T+2P=6	4+1=5
SECOND YEAR SEMESTER - III				
BS 301	SEC-1: Nursery and Gardening	SEC-1	2	2
BS 302	SEC-2: Biofertilizers and Organic Farming	SEC-2	2	2
BS 304	PAPER-III: Plant Anatomy and Embryology	DSC-1C	4T+2P=6	4+1=5
SECOND YEAR SEMESTER - IV				
BS 401	SEC-3: Greenhouse Technology	SEC-3	2	2
BS 402	SEC-4: Mushroom Culture Technology	SEC-4	2	2
BS 404	PAPER-IV : Cell Biology, Genetics & Plant Physiology	DSC-1D	4T+2P=6	4+1=5
THIRD YEAR SEMESTER - V				
BS 501	GE-1: Industrial Microbiology	GE-1	4T	4
BS 502	DSE -1A: Biodiversity & Conservation DSE -1B: Economic Botany DSE -1C: Seed Technology	DSE-1A / DSE-1B / DSE-1C	4+2	4+1
THIRD YEAR SEMESTER - VI				
BS 601	DSE-3: Project (Group Projects)	PROJECT	4	4
BS 602	DSE -2A: Plant Molecular Biology DSE -2B: Tissue Culture and Biotechnology DSE -2C: Analytical Techniques in Plant Sciences	DSE-2A / DSE-2B / DSE-5E	4T+2P=6	4+1=5

AECC: Ability Enhancement Compulsory Course, SEC: Skill Enhancement Course, GE: Generic Elective, DSC: Discipline Specific Core, DSE: Discipline Specific Elective

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Neelima
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Neelima

Annexure – I (Credits)
Proposed CBCS Scheme for B.Sc.
w.e.f 2019-20

Courses		Papers	Total Credits	Credits for each paper / Semester					
				B.Sc.					
				I	II	III	IV	V	VI
Core Courses DSC	Optional-1	4	20	5	5	5	5	-	-
	Optional-2	4	20	5	5	5	5	-	-
	Optional-3	4	20	5	5	5	5	-	-
Elective Courses DSE	Optional-1	2	10	-	-	-	-	5	5
	Optional-2	2	10	-	-	-	-	5	5
	Optional-3	2	10	-	-	-	-	5	5
Language	English(First Language)	5	20	4	4	3	3	3	3
	Second Language	5	20	4	4	3	3	3	3
Ability Enhancement Compulsory Course AECC	Environmental Science / Basic Computer Skills	1	2	2	-	-	-	-	-
	Basic Computer Skills / Environmental Science	1	2	-	2	-	-	-	-
Skill Enhancement Course SEC	SEC1	1	2	-	-	2	-	-	-
	SEC2	1	2	-	-	2	-	-	-
	SEC3	1	2	-	-	-	2	-	-
	SEC4	1	2	-	-	-	2	-	-
Generic Elective GE	Open Stream	1	4	-	-	-	-	4	-
Project Work/Optionals		1	4	-	-	-	-	-	4
Total Credits in each semester				25	25	25	25	25	25
Total Credits in UG				150					
Credits under Non-CGPA		NSS /NCC /sports / Extra curricular	6	Upto 6 (2 in each year)					
		Summer Internship	4	Upto 4 (2 in each, after I & II years)					

Annexure II

Proposed New Grading System

SGPA (SEMESTER GRADE POINT AVERAGE)			
S. No.	Grade Point	Range of marks	Grade Letter
1	10	Equal to and above 90 Marks	A+
2	9	More than or equal to 80 and less than 90 Marks	A
3	8	More than or equal to 70 and less than 80 Marks	B+
4	7	More than or equal to 60 and less than 70 Marks	B
5	6	More than or equal to 55 and less than 60 Marks	C+
6	5	More than or equal to 50 and less than 55 Marks	C
7	4	More than or equal to 40 and less than 50 Marks	D
8	0	Below 40 Marks	F

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B.Sc (CBCS) Botany- I year
Semester-I - Paper-I
Microbial Diversity of Lower Plants

DSC - 1A (4 hrs./week)

Theory Syllabus

Credits- 4
(60 hours)
(15 hours)

UNIT - I

1. Bacteria : Structure, nutrition, reproduction, and economic importance .Brief account of Archaeobacteria and Actinomycetes and Mycoplasma with reference to little leaf of Brinjal and Papaya leaf curl.
2. Viruses: Structure, replication and transmission; plant diseases caused by viruses and their control with reference to Tobacco Mosaic and Rice Tungro.
3. An outline of plant diseases of important crop plants caused by bacteria and their control with reference to Angular leaf spot of cotton and Bacterial blight of Rice.

UNIT- II

(15hours)

4. General characters, structure, reproduction and classification of algae (Fritsch).
5. Cyanobacteria : General characters , cell structure their significance as biofertilizers with special reference to Oscillatoria, Nostoc and Anabaena.
6. Structure and reproduction of the following:
Chlorophyceae- *Volvox*, *Oedogonium* and *Chara*.
Phaeophyceae-*Ectocarpus*
Rhodophyceae- *Polysiphonia*.

UNIT-III


(15hours)

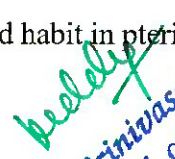
7. General characters and classification of fungi (Ainsworth).
8. Structure and reproduction of the following:
(a) Mastigimycotina- *Albugo*
(b) Zygomycotina- *Mucor*
(c) Ascomycotina- *Saccharomyces* and *Penicillium*.
(d) Basidiomycotina- *Puccinia*
(e) Deuteromycotina- *Cercospora*.
9. Economic importance of Lichens.

UNIT-IV

(15hours)

10. Bryophytes : Structure , reproduction , life cycle and systematic position of Marchantia, Anthoceros and Polytrichum, Evolution of Sporophyte in Bryophytes.
11. Pteridophytes : Structure , reproduction , life cycle and systematic position of Rhynia, Lycopodium, Equisetum and Marsilea.
12. Stelar evolution, Heterospory and Seed habit in pteridophytes.



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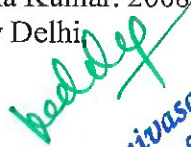

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References:

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**B.Sc I(CBCS) Botany-I year
Semester-I - Paper-I
Microbial Diversity of Lower Plants
Theory Model Question Paper**

Time : 2 ½ hrs

Max. Marks: 70

Instruction to the candidates: Draw neat labeled diagrams wherever necessary

Section A

1. Define or explain All of the following: -

5 X 2 = 10M

- 1.
- 2.
- 3.
- 4.
- 5.

Section B

(Instruction to the question PAPER SETTER : Set atleast ONE question from Each Unit of the given syllabus.)

Write short answers for FOUR of the following:

4 X 5 = 20 M

- 6.
- 7.
- 8.
- 9.
- 10.
- 11.

Section C

(Instruction to the question PAPER SETTER : Set atleast TWO question from Each Unit of the given syllabus.)

Write detailed answers for ALL of the following:

4 X 10 = 40 M

Unit - I

12 . a)

OR

b)

Unit - II

13 . a)

OR

b)

Unit - III

14 . a)

OR


b)


Unit - IV

15 . a)

OR

b)


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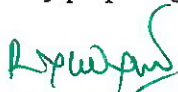

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B.Sc (CBCS) Botany-I year
Semester-I - Paper-I
Microbial Diversity of Lower Plants
Practical Syllabus

(45 hours)

1. Study of viruses and bacteria using electron micrographs (photographs).
2. Gram staining of Bacteria.
3. Study of symptoms of plant diseases caused by viruses, bacteria, Mycoplasma and fungi:
Viruses: Tobacco mosaic
Bacteria: Angular leaf spot of cotton and Rice tungro.
Mycoplasma: Little leaf of Brinjal and Leaf curl of papaya
Fungi: White rust on Crucifers, Rust on wheat & Tikka disease of Groundnut.
4. Vegetative and reproductive structures of the following taxa:
Algae: *Oscillatoria*, *Nostoc*, *Volvox*, *Oedogonium*, *Chara*, *Ectocarpus* and *Polysiphonia*.
Fungi: *Albugo*, *Mucor*, *Saccharomyces*, *Penicillium*, *Puccinia* and *Cercospora*
5. Section cutting of diseased material infected by Fungi and identification of pathogens as per theory syllabus. White rust of Crucifers, Rust on wheat & Tikka disease of Groundnut.
6. Lichens: Different types of thalli and their external morphology
7. Examination of important microbial, fungal and algal products:
Biofertilizers, protein capsules, antibiotics, mushrooms, Agar-agar etc.
8. Field visits to places of algal / microbial / fungal interest (e.g. Mushroom cultivation, water bodies).
9. Study of Morphology (vegetative and reproductive structure) and anatomy of the following Bryophytes: *Marchantia* and *Anthoceros* and *Polytrichum*.
10. Study of morphology (vegetative and reproductive structure) and anatomy of the following Pteridophytes : *Lycopodium*, *Equisetum* and *Marsilea*.
11. Study of Anatomical features of *Lycopodium* stem, *Equisetum* stem, and *Marsilea* petiole and rhizome by preparing double stained permanent mounts.


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**B. Sc (CBCS) Botany- I year
Semester-I - Paper-I
Microbial Diversity of Lower Plants
Practical Model Paper**

Time : 2 1/2 hrs

Max. Marks: 50

1. Identify the given components 'A' , 'B' & 'C' in the algal mixture .
Describe with neat labeled diagrams & give reasons for the classifications. 3 X 5 = 15M
2. Classify the given bacterial culture 'D' using Gram – staining technique. 8M
3. Take a thin transverse section of given diseased material 'E'.
Identify & describe the symptoms caused by the pathogen. 8M
4. Prepare a slide of the given material 'F'.(Pteridophyta) 6 M
5. Comment on the given slides 'I' & 'J' .
(Algae-1 , Fungi-1) 2 X 2 = 4 M
6. Identify the given specimen ' K' & Slide 'L'
(Bryophytes &Pteridophytes). 2 X 2 = 4 M
7. Record. 1X5 =5 M

L. Prasad

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Reddy

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N. Reddy

U.G. I Year Semester - I - (B.Sc./B.A./B.Com.) CBCS

Environmental Studies

AECC-2 (2 hrs./ week)

Credits-2

(30 Hours)

Unit – I : Ecosystem, Biodiversity & Natural Resources

(15 Hours)

1. Definition, scope and importance of Environmental Studies.
2. Structure of Ecosystem – Abiotic & Biotic components Producers, Consumers, Decomposers, Food chains, Food webs, Ecological Pyramids.
3. Functions of an Ecosystem: Energy flow in the Ecosystem (Single channel energy flow model)
4. Definition of Biodiversity, Genetic, Species and Ecosystem diversity, Hot-spots of Biodiversity, Threats to Biodiversity, Conservation of Biodiversity (Insitu and Exsitu)
5. Renewable and Non - renewable resources, Brief account of Forest, Mineral and Energy (Solar Energy and Geothermal Energy) resources.
6. Water Conservation, Rain water harvesting and Watershed management

Unit – II : Environmental pollution, Global Issues and Legislation

(15 Hours)

1. Causes, Effects and control measures of air pollution, water pollution.
2. Solid waste management.
3. Global warming and ozone layer depletion.
4. III – Effects of Fire – Works
5. Disaster management – floods, earthquakes and cyclones.
6. Environmental Legislation:-
(a) Wild life protection Act (b) Forest Act (c) Water Act (d) Air Act
7. Human rights
8. Women and child welfare
9. Role of information technology in environment and human health.

❖ Field Study:

(5 Hours)

- Pond Ecosystem
- Forest Ecosystem

References:

- Environmental studies – From crises to cure – by R. Rajagopalan (Third edition) Oxford University Press.

Text book of environmental studies for Undergraduate courses (Second edition) By Erach Bharucha.

A text book of environmental studies by Dr. D.K. Asthana and Dr. Meera Asthana.

Rajagan
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Meera
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Meera

ENVIRONMENTAL STUDIES

Semester – I – Paper - I

Model Question Paper For Semester Examination (End) for AECC

TIME: 2 Hours

MAX MARKS: 40

Credits – 2

Section A

Answer the following in short:

4 X 5 = 20 M

- 1.
- 2.
- 3.
- 4.

Section B

Answer the following essays:

2 X 10 = 20 M

5. (a)

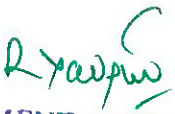
OR


(b)

6. (a)

OR

(b)


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B.Sc (CBCS) Botany- I year
Semester-II - Paper-II
Gymnosperms, Taxonomy of Angiosperms and Ecology

DSC-1B (4 hrs./week)

Theory Syllabus

Credits- 4
(60 hours)

UNIT-I

15 hrs

1. Gymnosperms: General characters, structure, reproduction and classification (Sporne's) Distribution and Economic importance of Gymnosperms.
2. Morphology of vegetative and reproductive parts, systematic position and life cycle of *Pinus* and *Gnetum* .
3. Geological time scale Introduction to Palaeobotany , Types of fossils and fossilization , importance of fossils.

UNIT-II

15 hrs

4. Introduction : Principles of plant systematic, Types of classification : Artificial , Natural and Phylogenetic ; Systems of classifications ; salient features and comparative account of Bentam and Hooker , Engler and Prantl classification systems. An introduction to Angiosperm Phylogeny Group (APG)
5. Current concepts in Angiosperm Taxonomy : Embryology in relation to taxonomy, Cytotaxonomy, Chemotaxonomy and Numerical Taxonomy

6. Nomenclature and Taxonomic resources: An introduction to ICBN, Shenzen code – a brief account . Herbarium : Concept, techniques and applications.

UNIT-III

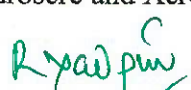
15 hrs

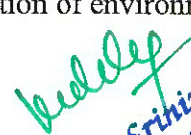
7. Systematic study and economic importance of plants belonging to the following families :
Polypetalae : Annonaceae, Capparidaceae, Rutaceae, Fabaceae, (Faboideae / Papilionoideae, Caesalpinioideae, Mimosoideae) , Cucurbitaceae
8. Gamopetalae : Apiaceae, Asteraceae, Asclepiadaceae, Lamiaceae, Monochalmydeae :
Amaranthaceae, Euphorbiaceae
9. Monocotyledons : Orchidaceae, Poaceae and zingiberaceae

UNIT-IV.

15 hrs

10. Component of eco system, energy flow, food chain and food webs.
11. Plants and environment, ecological adaptations of plants, Hydrophytes, Xeophytes and Mesophytes.
12. Plant Succession serial stages, modification of environment , climax formation with reference to Hydrosere and Xerosere.



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2. Pandey, B. P. 2006. College Botany, Vol. II: Pteridophyta, Gymnosperms and Paleobotany. S. Chand & Company Ltd, New Delhi.
3. Sporne, K. R. 1965. Morphology of Gymnosperms. Hutchinson Co., Ltd., London.
4. Vashishta, P. C., A. K. Sinha and Anil Kumar. 2006. Botany - Pteridophyta (Vascular Cryptogams). . Chand & Company Ltd, New Delhi.
5. Pandey, B. P. 2001. College Botany, Vol. I: Algae, Fungi, Lichens, Bacteria, Viruses, Plant Pathology, Industrial Microbiology and Bryophyta. S. Chand & Company Ltd, New Delhi.
6. Pandey, B. P. 2007. Botany for Degree Students: Diversity of Microbes, Cryptogams, Cell Biology and Genetics. S. Chand & Company Ltd, New Delhi.
7. Thakur, A. K. and S. K. Bassi. 2008. A Textbook of Botany: Diversity of Microbes and Cryptogams. S. Chand & Company Ltd, New Delhi.
8. Vashishta, B. R., A. K. Sinha and Adarsha Kumar. 2008. Botany for Degree Students: Bryophyta. S. Chand & Company Ltd, New Delhi.
9. Vashishta, P. C., A. K. Sinha and Anil Kumar. 2006. Botany for Degree Students: Gymnosperms. Chand & Company Ltd, New Delhi.
10. Dutta A.C. 2016. Botany for Degree Students. Oxford University Press.
11. Pandey, B.P. 2007. Botany for Degree students: Diversity of Seed Plants and their Systematics, Structure, Development and Reproduction in Flowering plants S. Chand and Ltd, New Delhi.
12. Stace, C.A. 1989 Plant taxonomy and Bio statistics (2nd Ed), Edward Arnold, London.
13. Singh. G. 1999. Plant systematics: Theory and Practice. Oxford and IBH, New Delhi.
14. Dutta A.C. 2016. Botany for degree students . Oxford university press.
15. Davis, P.H. and V.H. Heywood. 1963. Principles of angiosperms Taxonomy. Oliver and Boyd, London.
16. Heywood , V.H. 1965. Plant Taxonomy. ELBS, London.
17. Heywood , V.H. and D.M. Moore (Eds). 1984. Current concepts in Plant Taxonomy. Academic Press, London.
18. Jeffrey, C. 1982. An introduction To Plant Taxonomy. Cambridge University Press, Cambridge. London.
19. Michael , S. 1996. Ecology , Oxford University Press , London.


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B.Sc (CBCS) Botany- I year
Semester-II - Paper-II
(Module : Gymnosperms, Taxonomy of Angiosperms and Ecology)

Theory Model Question Paper

Time : 2 ½ hrs

Max. Marks: 70

Instructions to the candidates: Draw well-labeled diagrams wherever necessary.

SECTION A

5 X 2 = 10M

Define or explain ALL of the following:

- 1.
- 2.
- 3.
- 4.
- 5.

SECTION B

(Instructions to the question PAPER SETTER: Set atleast ONE question for EACH UNIT of the given syllabus)

Write short answer for FOUR of the following

4 X 5 = 20 M

- 6.
- 7.
- 8.
- 9.
- 10.
- 11.

SECTION C

(Instruction to the question PAPER SETTER : Set atleast TWO question from EACH UNIT of the given syllabus.)

Write detailed answers for ALL of the following:

4 X 10 = 40 M

Unit - I

12 . a)

OR

b)

Unit - II

13 . a)

OR

b)

Unit - III

14 . a)

OR

b)

Unit - IV

15 . a)


OR

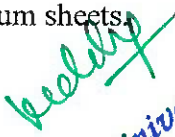
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B.Sc (CBCS) Botany- I year
Semester-II - Paper-II
Gymnosperms, Taxonomy of Angiosperms and Ecology
Practical Syllabus – 2019

(45 hours)

1. Study of Morphology (vegetative and reproductive structures) of the following taxa:
Gymnosperms: *Pinus* and *Gnetum*.
2. . Study of Anatomical features of *Pinus* needle and *Gnetum* stem by preparing double stained permanent mounts.
3. Fossil forms using permanent slides / photographs: *Cycadeoidea*.
Systematic study of locally available plants belonging to the families prescribed in theory Syllabus (Minimum of one plant representative for each family).
4. Study of morphological and anatomical characteristics of locally available plant species
(*Eichornia*, *Hydrilla*, *Pistia*, *Nymphaea*, *Asparagus*, *Opuntia*, *Euphorbia melli*)
5. Demonstration of herbarium techniques.
6. Candidate has to submit at least 30 herbarium sheets.


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**B.Sc (CBCS) Botany- I year
Semester-II - Paper-II
Gymnosperms, Taxonomy of Angiosperms and Ecology
Practical Model Paper**

Time : 2 1/2 hrs

Max. Marks: 50

- 1 . Prepare a mount of the given material ' A ' (Hydrophytes / Xerophytes)
Draw diagram & give reasons for identification. 8M

- 2 . Prepare a double stained permanent mount of the given material ' B ' (Gymnosperms)
Draw diagram & give reasons for identification. 10M

- 3 . Identify the given specimens C , & D (Gymnosperms / Xerophytes) 2 X 3 = 6M

- 4 . Identify the given slides E , & F , (Gymnosperms / Xerophytes) 2 X 3 = 6M

5. Technical description of the given plant twig 'G' 12M

6. Herbarium 3M

- 7 . Record 5M

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Reddy

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Noble

U.G. I YEAR Semester –II – (B.Sc/B.A /B.COM)

(w.e.f Academic Year 2016 –17)

Gender Sensitization

AECC – 2

Credits -2

Unit – I (Theory) – 1 Credit – 1 Hour of instruction per week

- 1.. Gender : Definition, Nature and Evolution , Culture, Tradition, Historicity.
2. Gender Spectrum: Biological, Sociological, Psychological Conditioning.
3. Gender based division of labour -- domestic work and use value.
4. Gender, Human Rights and Parity (parallel progress of both genders).

Unit-II (Practical Activity) 1 Credit – 2Hours of Activity per Week

Group discussion ,Presentation, Role play, Survey, Case studies , Group project based on following issues:

1. Respect and Co-existence.
2. Social, Biological, Psychological, Political, Economic, Cultural,Health issues.
3. Domestic Violence, Eve-Teasing , SexualHarassment.
4. Real Life Experience of Gender Interaction.
5. Print and Electronic Media and Gender Inequalities.
6. Contempory Challenges.

BOOK : “ Towards a World of Equals : A Bilingual Text book on Gender “ published by Telugu Akademi

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K. Srinivasa Reddy

Under Choice Based Credit System

2019

B.Sc Botany CBCS Common Core Syllabus (wef 2019-2020).

PROPOSED SCHEME FOR B.Sc BOTANY PROGRAMME UNDER CHOICE BASED CREDIT SYSTEM				
FIRST YEAR SEMESTER-I				
Code	Course Title	Course Type	HPW	Credits
BS 101	Environmental Studies	AECC-I	2	2
BS 104	Optional I	DSC-I-A	4T 2P=6	4+1=5
Paper-I Microbial Diversity of Lower Plants				
SEMESTER-II				
Code	Course Title	Course Type	HPW	Credits
BS204	Optional-I	DSC-1B	4T + 2P = 6	4 + 1 = 5
Paper-II Bryophytes Pteridophytes, Gymnosperms and Paleobotany				
SECOND YEAR SEMESTER-III				
Code	Course Title	Course Type	HPW	Credits
BS304	Optional-I	DSC-1C	4T + 2P = 6	4 + 1 = 5
Paper-III Taxonomy of Angiosperms and Medicinal Botany				
SEMESTER-IV				
Code	Course Title	Course Type	HPW	Credits
BS404	Optional - I	DSC-1D	4T + 2P = 6	4 + 1 = 5
Paper-IV Plant Anatomy, Embryology and Palaeology				
THIRD YEAR SEMESTER-V				
Code	Course Title	Course Type	HPW	Credits
BS 503	Optional-I	DSC - IE	3T + 2P = 5	3 + 1 = 4
Paper-V: Cell Biology and Genetics				
BS 505	Optional I A/B	DSE-1#	3T + 2P = 5	3 + 1 = 4
Paper-VI Elective-I Ecology and Biodiversity / Elective II: Horticulture				
SEMESTER-VI				
Code	Course Title	Course Type	HPW	Credits
BS 603	Optional-I	DSC - 1F	3T + 2P = 5	3 + 1 = 4
Paper-VII : Plant Physiology				
BS 605	Optional A/B/	DSE - 1F	3T + 2P = 5	3 + 1 = 4
Paper-VIII Elective III Tissue Culture and Biotechnology / Elective-IV: Seed Technology				

AECC: Ability Enhancement Compulsory Course; DSC: Discipline Specific Course;

DSE : Discipline Specific Elective

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B. Sc (CBCS) BOTANY- II YEAR
Semester-III - Paper-III
Taxonomy of Angiosperms and Medicinal Botany

DSC-1C(4 hrs./week)

Theory syllabus

Credits-4
(60 hours)

UNIT - I

1. Introduction: Principles of plant systematics, Types of classification: Artificial, Natural and Phylogenetic; Systems of classification: Salient features and comparative account of Bentham & Hooker and Engler & Prantle. An introduction to Angiosperm Phylogeny Group (APG). (7h)
- 2.. Current concepts in Angiosperm Taxonomy: Embryology in relation to taxonomy, Cytotaxonomy, Chemotaxonomy and Numerical Taxonomy. (4 h)
- 3.. Nomenclature and Taxonomic resources: An introduction to ICBN, Vienna code - a brief account. Herbarium: Concept, techniques and applications. (4 h)

UNIT-II

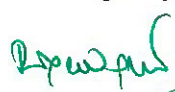
- 4.. Systematic study and economic importance of plants belonging to the following families: Polypetalae : Annonaceae, Capparidaceae, Rutaceae, Fabaceae (Faboideae/papilionoideae, Caesalpinioideae, Mimosoideae), Cucurbitaceae
5. Gamopetalae: Apiaceae, Asteraceae, Asclepiadaceae, Lamiaceae
6. Monochalmydeae: Amaranthaceae, Euphorbiaceae, Monocotyledons: Orchidaceae and Poaceae. (15h)


UNIT - III

- 7.. Ethnomedicine: Scope, interdisciplinary nature, distinction of Ethnomedicine from Folklore medicine. (3h)
8. Outlines of Ayurveda, Sidda, Unani and Homeopathic systems of traditional medicine. Role of AYUSH, NMPB, CIMAP and CDRI. (5 h)
- 9.. Plants in primary health care: Common medicinal plants – Tippateega (*Tinospora cordifolia*), tulasi (*Ocimum sanctum*), pippallu (*Piper longum*), Karakaya (*Terminalia chebula*), Kalabanda (*Aloe vera*), Turmeric (*Curcuma longa*). Evaluation of crude drugs. (7h)

UNIT-IV

10. Traditional medicine vs Modern medicine: Study of selected plant examples used in traditional medicine as resource (active principles, structure, usage and pharmacological action of modern medicine: Aswagandha (*Withania somnifera*), Sarpagandha (*Rauwolfia serpentina*), Nela usiri (*Phyllanthus amarus*), Amla (*Phyllanthus emblica*) and Brahmi (*Bacopa monnieri*). (8h)
11. Pharmacognosy: Introduction and scope. Adulteration of plant crude drugs and methods of identification - some examples. Indian Pharmacopoeia. (4h)
10. Plant crude drugs: Types, methods of collection, processing and storage practices. (3h)

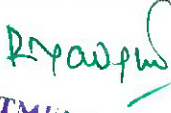

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References:

- Pandey, B. P. 2007. Botany for Degree Students: Diversity of Seed Plants and their Systematics, Structure, Development and Reproduction in Flowering Plants. S. Chand & Company Ltd, New Delhi.
- Rastogi, R. R. and B. N. Mehrotra. 1993. Compendium of Indian Medicinal Plants. Vol. I & Vol. II. CSIR, Publication and Information Directorate, New Delhi.
- Sivarajan, V. V. and I. Balasubramanian. 1994. Ayurvedic Drugs and their Plant Sources. Oxford and IBH, New Delhi.
- Stace, C. A. 1989. Plant Taxonomy and Biostatistics (2nd Ed.). Edward Arnold, London.
- Singh, G. 1999. Plant Systematics: Theory and Practice. Oxford and IBH, New Delhi.
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- Jain, S. K. and V. Mudgal. 1999. A Handbook of Ethnobotany. Bishen Singh Mahendra Pal Singh, Dehradun.
- Jeffrey, C. 1982. An Introduction to Plant Taxonomy. Cambridge University Press, Cambridge. London.
- Joshi, S. G. 2000. Medicinal Plants. Oxford and IBH, New Delhi.
- Kokate, C. and Gokeale- Pharmacognacy- Nirali Prakashan, NewDelhi.
- Lad, V. 1984. Ayurveda – The Science of Self-healing. Motilal Banarasidass, New Delhi.
- Lewis, W. H. and M. P. F. Elwin Lewis. 1976. Medical Botany. Plants Affecting Man's Health. A Wiley Inter science Publication. John Wiley and Sons, New York.


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B. Sc (CBCS) BOTANY- II YEAR
Semester-III - Paper-III
Taxonomy of Angiosperms and Medicinal Botany
Theory Model Question Paper

Time : 2 ½ hrs

Max. Marks: 70

Instructions to the candidates: Draw well-labeled diagrams wherever necessary.

SECTION A

5 X 2 = 10M

Define or explain ALL of the following:

- 1.
- 2.
- 3.
- 4.
- 5.

SECTION B

(Instructions to the question PAPER SETTER: Set atleast ONE question for EACH UNIT of the given syllabus)

Write short answer for FOUR of the following

4 X 5 = 20 M

- 6.
- 7.
- 8.
- 9.
- 10.
- 11.

SECTION C

(Instruction to the question PAPER SETTER : Set atleast TWO question from EACH UNIT of the given syllabus.)

Write detailed answers for ALL of the following:

4 X 10 = 40 M

Unit - I

12 . a)

OR

b)

Unit - II

13 . a)

OR

b)

Unit - III

14 . a)

OR

b)

Unit - IV

15 . a)

OR

b)

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B.Sc (CBCS) BOTANY- II YEAR
Semester-III - Paper-III
Taxonomy of Angiosperms and Medicinal Botany
Practical syllabus

(45 hours)

1. Systematic study of locally available plants belonging to the families prescribed in theory syllabus (Minimum of one plant representative for each family) (24h)
2. Demonstration of herbarium techniques. (3 h)
3. Identification, medicinal value & active principle present in the following plants : Tulasi (*Ocimum sanctum*), Karakaya (*Terminalichebula*), Kalabanda (*Aloe vera*). (6 h)
4. Ethnomedicinal value/practice of the following plants :
Aswagandha (*Withania somnifera*), Sarpagandha (*Rauwolfiaserpentina*), Amla (*Phyllanthus emblica*) and Brahmi (*Bacopa monnieri*). (6h)
5. Pharmacognosy:
Powder analysis : Pippalu (*Piper longam*), Nela usiri (*Phyllanthus niruri*), Study of Organoleptic (sectional study) of the following:
Tippateega (*Tinospora cordifolia*) and Turmeric (*Curcuma longa*). (6h)
6. Candidate have to submit at least 30 herbarium sheets


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B.Sc (CBCS) BOTANY- II YEAR
Semester-III - Paper-III
Taxonomy of Angiosperms and Medicinal Botany
Practical Model Paper

Time: 2 1/2 hrs

Max. Marks: 50

- | | |
|---|-----|
| 1. Technical description of the given plant twig ' A ' | 18M |
| 2. Identify the given material ' B ' & write its medicinal properties | 6M |
| 3. Identify the specimen ' C ' & write organoleptic evaluation | 6M |
| 4. Identify the given material D ' & discuss the ethno medicinal value of it. | 6M |
| 5. Identify the given material ' E ' . Write the active principle and uses | 6M |
| 6. Herbarium | 4M |
| 7. Record | 4M |

R. Srinivasa Reddy

Reddy
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Reddy

B.SC (CBCS) BOTANY- II YEAR
Semester-IV- Paper IV
Plant Anatomy, Embryology and Palynology

DSC-1D (4 hrs./week)	Theory syllabus	Credits-4 (60 hours)
-----------------------------	------------------------	---------------------------------

UNIT - I:

- | | |
|---|-------|
| 1. Meristems: Types, histological organization of shoot and root apices and theories. | (3h) |
| 2. Tissues and Tissue Systems: Simple, complex and special tissues. | (6 h) |
| 3. Leaf: Ontogeny, diversity of internal structure; stomata and epidermal outgrowths. | (6 h) |

UNIT-II

- | | |
|---|------|
| 4. Stem and root anatomy: Vascular cambium - Formation and function. | (3h) |
| 5. Anomalous secondary growth of Stem - <i>Achyranthes</i> , <i>Boerhaavia</i> , <i>Bignonia</i> , <i>Dracaena</i> ;
Root- <i>Beta vulgaris</i> | (5h) |
| 6. Wood structure: General account. Study of local timbers – Teak (<i>Tectona grandis</i>),
Rosewood, (<i>Dalbergia latifolia</i>), Red sanders, (<i>Pterocarpus santalinus</i>) Nallamaddi
(<i>Terminalia tomentosa</i>) and Neem (<i>Azadirachta indica</i>). | (7h) |

UNIT - III

- | | |
|--|------|
| 7. Introduction: History and importance of Embryology. | (2h) |
| 8. Anther structure, Microsporogenesis and development of male gametophyte. | (6h) |
| 9. Ovule structure and types; Megasporogenesis; types and development of female gametophyte. | (7h) |

UNIT-IV

- | | |
|--|------|
| 10. Pollination - Types; Pollen - pistil interaction. Fertilization. | (4h) |
| 11. Endosperm - Development and types. Embryo - development and types; Polyembryony and Apomixis - an outline. | (5h) |
| 12.. Palynology- Pollen morphology, NPC system and application of Palynology. | (6h) |

R. Prasad

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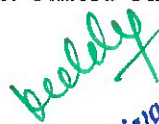
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N. S. Reddy

References:

- Bhattacharya et. al. 2007. A textbook of Palynology, Central, New Delhi.
- Bhojwani, S. S. and S. P. Bhatnagar. 2000. The Embryology of Angiosperms (4th Ed.), Vikas Publishing House, Delhi.
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- Vashista- A textbook of Anatomy.
- P.K.K.Nair- A textbook of Palynology.
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- Johri, B. M. 1984. Embryology of Angiosperms. Springer-Verleg, Berlin.
- Kapil, R. P. 1986. Pollination Biology. Inter India Publishers, New Delhi.
- Maheswari, P. 1971. An Introduction to Embryology of Angiosperms. McGraw Hill Book Co., London.
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Dist. Nalgonda - 508 118


Dr. K. Srinivasa Reddy,
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B.SC (CBCS) BOTANY- II YEAR
Semester-IV- Paper IV
Plant Anatomy, Embryology and Palynology
Theory Model Question Paper

Time : 2 ½ hrs

Max. Marks: 70

Instructions to the candidates: Draw neat labeled diagrams wherever necessary.

SECTION A

5 X 2 = 10M

Define or explain ALL of the following:

- 1.
- 2.
- 3.
- 4.
- 5.

SECTION B

(Instructions to the question PAPER SETTER: Set atleast ONE question for EACH UNIT of the given syllabus)

Write short answer for FOUR of the following

4 X 5 = 20 M

- 6.
- 7.
- 8.
- 9.
- 10.
- 11.

SECTION C

(Instruction to the question PAPER SETTER : Set atleast TWO question from EACH UNIT of the given syllabus.)

Write detailed answers for ALL of the following:

4 X 10 = 40 M

Unit - I

12 . a)

OR

b)

Unit - II

13 . a)

OR

b)

Unit - III

14 . a)

OR

b)

Unit - IV

15 . a)

OR

b)

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B.SC (CBCS) BOTANY- II YEAR
Semester-IV- Paper IV
Plant Anatomy, Embryology and Palynology


Practical syllabus

(45 hours)

Suggested Laboratory Exercises:

1. Demonstration of double staining technique. (3 h)
2. Tissue organization in root and shoot apices using permanent slides (3 h)
3. Preparation of double stained Permanent slides
Primary structure: Root - *Cicer*, *Canna*; Stem - *Tridax*, *Sorghum* (6 h)
Secondary structure: Root - *Tridax* sp.; Stem - *Pongamia*
Anomalous secondary structure: Examples as given in theory syllabus. (6 h)
4. Stomatal types using epidermal peels. (3 h)
5. Microscopic study of wood in T.S., T.L.S. and R.L.S. (6 h)
6. Structure of anther and microsporogenesis using permanent slides. (3 h)
7. Structure of pollen grains using whole mounts - *Hibiscus*, *Acacia* and Grass). (3 h)
8. Pollen viability test using Evans Blue - *Hibiscus* (3 h)
9. Study of ovule types and developmental stages of embryosac. (3 h)
10. Structure of endosperm (nuclear and cellular); Developmental stages of dicot and monocot embryos using permanent slides. (3 h)
11. Isolation and mounting of embryo (using *Cymopsis* / *Senna* / *Crotalaria*) (3 h)


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B.SC (CBCS) BOTANY- II YEAR
Semester-IV- Paper IV
Plant Anatomy, Embryology and Palynology
Practical Model Paper

Time: 2 1/2 hrs

Max. marks : 50

1. Prepare a double stained permanent mount of transverse section of given material " A " . 18M
2. Prepare a temporary mount of epidermal peel of the given leaf material " B " and identify the stomatal type . 8M
3. Conduct the pollen viability test " C " (OR) Isolate the embryo from the given material . 8M
4. Identify and describe the specimens / slides with well labelled diagrams
(a) Embryology – D (b) Palynology – E (c) Anatomy – F 3 X 4 = 12M
5. Record 4M

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K. Srinivas

**B.Sc. Botany- III Year
Semester-V : Paper-V
Cell Biology and Genetics**

DSC-1E (3 hrs/week)

Core Theory Syllabus

**Credits-3
45 hours**

Unit - I:


1. Principles of Microscopy: Light Microscope and Electron Microscope. (2 h)
2. Plant cell envelopes: Ultra structure of cell wall, molecular organization of cell membranes. (3 h)
3. Nucleus: Ultra structure, Nucleic acids - Structure of DNA, types and functions of RNA. (4 h)
4. Chromosomes: Morphology, organization of DNA in a chromosome, Euchromatin and Heterochromatin, Karyotype. Special types of chromosomes: Lampbrush and Polytene chromosomes. (3 h)
5. Extra nuclear genome: Mitochondrial DNA and Plastid DNA, Plasmids. (3 h)


Unit - II:

6. Cell division: Cell and its regulation; mitosis, meiosis and their significance (3h)
7. Mendelism: Laws of inheritance. Genetic interactions - Epistasis, Complementary, Supplementary and inhibitory genes. (5h)
8. Linkage: A brief account and theories of Linkage. Crossing over: Mechanism and theories of crossing over. (4 h)
9. Genetic maps: Construction of genetic maps with Two point and Three point test cross data. (3h)

Unit - III:

10. Mutations: Chromosomal aberrations - structural and numerical changes; Gene mutations, Transposable elements. (4h)
11. Gene Organization- Structure of gene, Genetic code, Process of DNA Replication with Polymerase enzyme. (5h)
12. Mechanism of transcription in Prokaryotes and Eukaryotes. (4h)
13. Regulation of gene expression in prokaryotes (Lac and Trp. Operons). (2h)


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2. Shukla, R. S. and P. S. Chandel. 2007. Cytogenetics, Evolution, Biostatistics and Plant Breeding. S.Chand & Company Ltd., New Delhi.
3. Singh, H. R. 2005. Environmental Biology. S. Chand & Company Ltd., New Delhi.
4. Snustad, D. P. and M. J. Simmons. 2000. Principles of Genetics. John Wiley & Sons, Inc., U S A.
5. Strickberger, M. W. 1990. Genetics (3rd Ed.). Macmillan Publishing Company.
6. Verma, P. S. and V. K. Agrawal. 2004. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand & Company Ltd., New Delhi.

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B.SC (CBCS) BOTANY- III YEAR
Semester-V- Paper V
Cell Biology and Genetics
Theory Model Question Paper

Time : 2 ½ hrs

Max. Marks: 70

Instructions to the candidates: Draw neat labeled diagrams wherever necessary.

SECTION A

5 X 2 = 10M

Define or explain ALL of the following:

- 1.
- 2.
- 3.
- 4.
- 5.

SECTION B

(Instructions to the question PAPER SETTER: Set atleast ONE question for EACH UNIT of the given syllabus)

Write short answer for FOUR of the following

4 X 5 = 20 M

- 6.
- 7.
- 8.
- 9.
- 10.
- 11.

SECTION C

(Instruction to the question PAPER SETTER : Set atleast TWO question from EACH UNIT of the given syllabus.)

Write detailed answers for ALL of the following:

4 X 10 = 40 M

Unit - I

12 . a)

OR

b)

Unit - II

13 . a)

OR

b)

Unit - III

14 . a)

OR

b)

From Any Unit

15 . a)

OR

b)

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B. Sc Botany- III Year
Semester-V: Paper-V
Cell Biology and Genetics - Credits-1

DSC-1E (2 hrs/week)

30 hours

Practical Syllabus

1. Demonstration of cytochemical methods: Fixation of plant material and nuclear staining for mitotic and meiotic studies. (4 h)
2. Study of various stages of mitosis using cytological preparation of Onion root tips. (4 h)
3. Study of various stages of meiosis using cytological preparation of Onion flower buds. (2 h)
4. Solving genetic problems related to monohybrid, dihybrid ratio incomplete dominance and interaction of genes (minimum of six problems in each topic). (8 h)
5. Construction of linkage maps; two and three point test cross. (4 h)
6. Study of ultra structure of cell organelles using photographers. Chloroplast, Mitochondria, Nucleus, Ribosomes, Endoplasmic reticulum, and Golgi complex. (4 h)
7. Study of Special types of Chromosomes (Polytene chromosome and Lampbrush chromosomes-Permanent slide) (4 h)

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**B.Sc. Botany- III Year
Semester-V - Paper-V
Cell Biology and Genetics
Practical Model Question Paper**

Time : 2 hrs

Max. marks : 50

1. Prepare a cytological slide of given material 'A' and identify & describe any two stages with well labeled diagrams. (12 marks)
2. Solve genetic problems 'B' related to dihybrid ratio or incomplete dominance (6marks)
3. Solve the genetic problem 'C' related to interaction of genes. (8 Marks)
4. Solve the genetic problem 'D' related to two or three point test cross (10 marks)
5. Slides/ Specimen (2x2) = (4 marks)
E-Cell organelles
F-Chromosomes (Polytene Chromosome)
6. Record (5 Marks)
7. Viva (5 Marks)

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N. S. Reddy

V - SEMESTER
SKILL Enhancement course [SEC]

Mushroom Cultivation Technology

2 Credits

Unit-I

1. Introduction, importance and history of mushroom cultivation in India.
2. Types of edible mushrooms available in India- Pleurotus citrinopileatus, Agaricus bisporus.
3. Nutritional and medicinal value of edible mushrooms

Unit-II

1. Steps in mushroom cultivation, selection of site and types of mushroom, farm structure, design layout principle and techniques of compost and composting.
2. Preparation of spawn casing and crop production, harvesting and marketing.
3. Types of food prepared from mushrooms. Research centres- National level and Regional level.

Suggested Readings:

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

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Mushroom Cultivation Technology () SEC)
Semester - V
Model Question Paper For Semester Examination (End)

TIME: 2 Hours

MAX MARKS: 40

Section - A

Answer any Five of the following questions:

5 x 8 = 40

1.

2.

3.

4.

5.

6.

7.

8.

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**B. Sc (CBCS) Botany-III Year
Semester-V: Elective-I
Ecology & Biodiversity**

DSE-1E (3 hrs./week)

**Credits-3
(45 hours)**

Theory Syllabus

UNIT - I


1. Concept and components of Ecosystem. Energy flow, food chains, food webs, ecological pyramids, Biogeochemical cycles - Carbon Cycle (4h)
2. Definition of Environment: Atmosphere (Troposphere, Stratosphere, Mesosphere, Ionosphere), Hydrosphere, Lithosphere & Biosphere. (3h)
3. Plants and environment: Ecological factors - Climatic (Light and Temperature) and biotic. Ecological adaptations of plants. (5h)
4. Edaphic Factors: Soil- Formation- Weathering, mode of formation- residual; Transported: Colluvial, Alluvial, Glacial & Eolian. Soil erosion & Conservation. (4h)

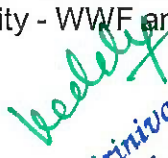
UNIT - II

5. Population ecology: Natality, Mortality, Growth curves, Ecotypes & Ecads. (4h)
6. Community ecology: Frequency, density cover, Life forms & Biological spectrum. (4h)
7. Community Dynamics: Succession - Serial stages, Modification of physical environment, Climax formation with reference to Hydrosere and Xerosere. (4h)
8. Production ecology: Concepts of productivity - Primary and Secondary Productivity. (4h)

UNIT- III

9. Biodiversity: Concepts, Convention of Biodiversity - Earth Summit (Copenhagen). (4h)
10. Biodiversity- Levels, threats and value (3h)
11. Hot spots of India - North Eastern Himalayas, Western Ghats; Endemism. IUCN categories, RED data book (3h)
12. Principles of conservation – *In situ* and *Ex situ*. Role of organizations in the conservation of Biodiversity - WWF and NBRGR. (3h)


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2. Khitoliya, R. K. 2007. Environmental Pollution – Management and Control for Sustainable Development. S. Chand & Company Ltd., New Delhi.
3. Michael, S. 1996. Ecology. Oxford University Press, London.
4. Mishra. D. D. 2008. Fundamental Concepts in Environmental Studies. S. Chand & Company Ltd., New Delhi.
5. Odum, E. P. 1983. Basics of Ecology. Saunder's International Students Edition, Philadelphia.
6. Sharma, P. D. 1989. Elements of Ecology. Rastogi Publications, Meerut.
7. Verma, P. S. and V. K. Agrawal. 2006. Genetics. S. Chand & Company Ltd., New Delhi

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K. S. Reddy

B.SC (CBCS) BOTANY- III YEAR
Semester-V: Elective-I
Ecology & Biodiversity
Theory Model Question Paper

Time : 2 hrs

Max. Marks: 70

Instructions to the candidates: Draw neat labeled diagrams wherever necessary.

SECTION A

5 X 2 = 10M

Define or explain ALL of the following:

- 1.
- 2.
- 3.
- 4.
- 5.

SECTION B

(Instructions to the question PAPER SETTER: Set atleast ONE question for EACH UNIT of the given syllabus)

Write short answer for FOUR of the following

4 X 5 = 20 M

- 6.
- 7.
- 8.
- 9.
- 10.
- 11.

SECTION C

(Instruction to the question PAPER SETTER : Set atleast TWO question from EACH UNIT of the given syllabus.)

Write detailed answers for ALL of the following:

4 X 10 = 40 M

Unit - I

12 . a)

OR

b)

Unit - II

13 . a)

OR

b)

Unit - III

14 . a)

OR

b)

From Any Unit

15 . a)

OR

b)

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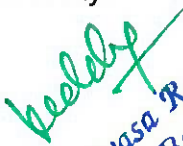
**B. Sc (CBCS) Botany-III Year
Semester-V: Elective-I
Ecology & Biodiversity**

Practical Syllabus

30 hours

1. Study of plant communities by Quadrat Method (8h)
2. Estimation of carbonates and bicarbonates in the given water sample. (4h)
3. Determination of soil texture (composition of clay, sand silt etc.) and pH. (2h)
4. Study of morphological and anatomical characteristics of plant communities using locally available plant species: Hydrophytes (*Eichhornia, Hydrilla, Pistia, Nymphaea, Vallisneria*), Xerophytes: (*Asparagus, Opuntia, Euphorbia melii*), (*Casuarina, Calotropis*). (8h)
5. Value of biodiversity
 - a) Medicinal value: *Catharanthus, Tinospora* and *Emblica*
 - b) Timber Value: *Acacia, Tectona* and *Azardirachta*
 - c) Aesthetic Value: *Mangifera, Ficus, Ocimum*
 - d) Assessment of local biodiversity. (8h)


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B.Sc (CBCS) Botany-III Year
Semester-V: Elective-I

Time: 2 hrs

Ecology & Biodiversity

Max. marks : 50

Practical Model Question Paper

1. Calculate the frequency and density of the given Quadrate (8M)
2. Estimate the amount of Carbonates/Bicarbonates present in the given water sample. (8M)
3. Determination of soil texture and pH. (5M)
4. Comment on the specimens A, B, C, D & E (5x2) = (10M)
5. Identify the given slides F & G (Hydrophytes & Xerophytes) (2x2) = (4M)
6. Biodiversity: Identification and Biodiversity value (Medicinal/Timber/Aesthetic) (5M)
7. Record (5M)
8. Viva (5M)

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B.Sc. (CBCS) Botany: III Year

**Semester-VI : Paper-VI
Plant Physiology**

DSC-1F (3hrs./week) Core

Credits-3

Theory Syllabus

(45 hours)

UNIT – I

1. Plant-Water Relations: Importance of water to plant life, physical properties of water, diffusion, imbibition, osmosis; water, osmotic and pressure potentials; absorption, transport of water, Ascent of sap; Transpiration; Stomatal structure and movements. (7h)
2. Mineral Nutrition: Essential macro and micro mineral nutrients and their role; symptoms of mineral deficiency. (3h)
3. Translocation of organic substances: Mechanism of phloem transport. (2h)
4. Enzymes: Nomenclature, Characteristics, Classification, Mechanism and regulation of enzyme action, factors regulating enzyme activity. (3h)


UNIT- II

5. Photosynthetic pigments, absorption and action spectra; Red drop and Emerson enhancement effect; concept of two photosystems; mechanism of photosynthetic electron transport and evolution of oxygen; Factors effecting Photosynthesis, Photophosphorylation. (6h)
6. Carbon assimilation pathways: C₃, C₄ and CAM. (4h)
7. Nitrogen Metabolism: Biological nitrogen fixation, nitrate reduction, ammonia assimilation, (GS-GOGAT, transamination) (4h)

UNIT – III

8. Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron transport system, mechanism of oxidative phosphorylation, pentose phosphate pathway. (5h)
9. Growth and Development: Physiological effects of phytohormones—Auxins, gibberellins, cytokinins, ABA, ethylene and Brassinosteroids (5h)
10. Physiology of flowering and photoperiodism. Role of Phytochrome in flowering. (3h)
11. Stress physiology: Concept of water, salt and temperature stresses and plant responses. (3h)


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3. Pandey, B. P. 2007. Botany for Degree Students: Plant Physiology, Biochemistry, Biotechnology, Ecology and Utilization of Plants. S. Chand & Company Ltd., New Delhi.
4. Salisbury, F. B. and C. W. Ross. 1992. Plant Physiology. 4th edn. (India Edition), Wordsworth, Thomson Learning Inc., USA.
5. Taiz, L. and E. Zeiger. 1998. Plant Physiology (2nd Ed.). Sinauer Associates, Inc., Publishers, Massachusetts, USA.
6. Dutta A.C. 2016. Botany for Degree Students. Oxford University Press.

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B.SC (CBCS) BOTANY- III YEAR
Semester-VI :Paper VI
PLANT PHYSIOLOGY
Theory Model Question Paper

Time : 2 hrs

Max. Marks: 70

Instructions to the candidates: Draw neat labeled diagrams wherever necessary.

SECTION A

5 X 2 = 10M

Define or explain ALL of the following:

- 1.
- 2.
- 3.
- 4.
- 5.

SECTION B

(Instructions to the question PAPER SETTER: Set atleast ONE question for EACH UNIT of the given syllabus)

Write short answer for FOUR of the following

4 X 5 = 20 M

- 6.
- 7.
- 8.
- 9.
- 10.
- 11.

SECTION C

(Instruction to the question PAPER SETTER : Set atleast TWO question from EACH UNIT of the given syllabus.)

Write detailed answers for ALL of the following:

4 X 10 = 40 M

Unit - I

12 . a)

OR

b)

Unit - II

13 . a)

OR

b)

Unit - III

14 . a)

OR


b)

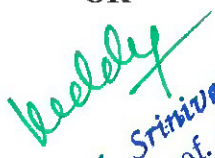
From Any Unit

15 . a)

OR

b)


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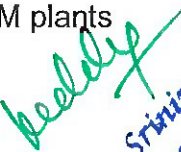


**B.Sc (CBCS) Botany: III Year
Semester-VI: Paper-VI
Plant Physiology
Practical Syllabus**

(30 hours)

1. Determination of osmotic potential of vacuolar sap by Plasmolytic method using leaves of *Rheodiscolor / Tradescantia*. (4h)
2. Determination of rate of transpiration using Cobalt chloride method (2h)
3. Determination of stomatal frequency using leaf epidermal peelings / impressions (4h)
4. Determination of catalase activity using potato tubers by titration method (4h)
5. Separation of chloroplast pigments using paper chromatography technique (8h)
6. Estimation of protein by Biurette method (4h)
7. Mineral deficiency- Detail study of Micronutrients and Macro nutrients (2h)
8. Identification of C₃, C₄ and CAM plants (2h)


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**B.Sc (CBCS) Botany: III Year
Semester-VI - Paper-VI
Plant Physiology
Practical Model paper**

Time : 2hrs

Max. marks: 50

Major Experiment - i: (Any One Question out of two) (12 marks)

1. Determination of Osmotic potential of vascular sap- Plasmolytic method.
2. Determination of Catalase activity – Potato, tubers by Titration method.

Major Experiment - ii: (Any One Question out of two) (12 marks)

3. Separation of Chloroplast pigments by Paper chromatography.
4. Estimation of proteins by Biuret Method.

II. Minor Experiment: (Any One Question out of two) (10 marks)

1. Determination of Stomatal frequency using leaf epidermal peel impressions.
2. Determination of Rate of transpiration by Cobalt chloride method.

III. Identify and Comment on: A, B & C (3x2=6 Marks)

1. Micronutrient Deficiency
2. Macronutrient Deficiency
3. C₃, C₄ and CAM plants.

IV. Record (5 Marks)

V. Viva (5 Marks)

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VI - SEMESTER

Skill Enhancement Course (SEC) Nursery and Gardening

(Credits 2)

Lectures: 30

Unit 1: Nursery: definition, objectives and scope and building up of infrastructure for nursery, planning and seasonal activities - Planting - direct seeding and transplants. (4 Lectures)

Unit 2: Seed: Structure and types - Seed dormancy; causes and methods of breaking dormancy - Seed storage: Seed banks, factors affecting seed viability, genetic erosion - Seed production technology - seed testing and certification. (6 Lectures)

Unit 3: Vegetative propagation: air-layering, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cuttings - Hardening of plants - green house - mist chamber, shed root, shade house and glass house. (6 Lectures)


Unit 4: Gardening: definition, objectives and scope - different types of gardening - landscape and home gardening - parks and its components - plant materials and design - computer applications in landscaping - Gardening operations: soil laying, manuring, watering, management of pests and diseases and harvesting. (8 Lectures)

Unit 5: Sowing/raising of seeds and seedlings - Transplanting of seedlings - Study of cultivation of different vegetables: cabbage, brinjal, lady's finger, onion, garlic, tomatoes, and carrots - Storage and marketing procedures. (6 Lectures)

Suggested Readings

1. Bose T.K. & Mukherjee, D., 1972, Gardening in India, Oxford & IBH Publishing Co., New Delhi.
2. Sandhu, M.K., 1989, Plant Propagation, Wile Eastern Ltd., Bangalore, Madras.
3. Kumar, N., 1997, Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
4. Edmond Musser & Andres, Fundamentals of Horticulture, McGraw Hill Book Co., New Delhi.
5. Agrawal, P.K. 1993, Hand Book of Seed Technology, Dept. of Agriculture and Cooperation, National Seed Corporation Ltd., New Delhi.
6. Janick Jules. 1979. Horticultural Science. (3rd Ed.), W.H. Freeman and Co., San Francisco, USA.


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Nursery and Gardening (GE & SEC)

Semester - VI

Model Question Paper For Semester Examination (End)

TIME: 2 Hours

MAX MARKS: 40

Section - A

Answer any Five of the following questions:

5 x 8 = 40

1.

2.

3.

4.

5.

6.

7.

8.

P. Prasad

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Reddy

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K. Srinivas Reddy

B.Sc (CBCS) Botany-III Year
Semester-VI: Elective-III
Tissue Culture and Biotechnology

DSE-1F (3 hrs./week)

Theory Syllabus

Credits-3

(45 hours)

UNIT - I

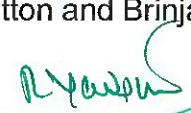
1. Tissue culture: Introduction, sterilization procedures, explants, culture media – composition and preparation; Micro propagation. (4h)
2. Organ culture: Vegetative Organs-Root, Shoot, Leaf culture (3h)
Reproductive Organs-Anther, Ovary, Ovule, Embryo culture
3. Callus culture, Cell and Protoplast culture (4h)
4. Somatic hybrids and Cybrids. (4h)

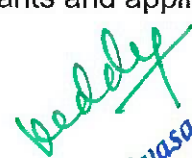
UNIT- II

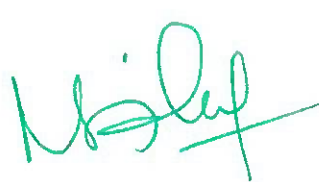
5. Applications of tissue culture: Production of pathogen free plants and somaclonal variants, production of stress resistance plants, secondary metabolites and synthetic seeds. (6h)
6. Induction of hairy roots and its applications in production of secondary metabolites. (2h)
7. Biotechnology: Introduction, history, scope and applications. (3h)
8. rDNA technology: Basic aspect of of gene cloning, Enzymes used in gene cloning- Restriction enzymes, Ligases, Polymerases. (4h)

UNIT- III

9. Gene cloning-Vectors – cloning vehicles (Plasmid , Cosmids, Bacteriophages , & Phasmids) application of r DNA technology. (5h)
10. Gene Libraries: Genomic Libraries, cDNA Libraries, Polymerase chain reaction and its applications. (4h)
11. Method of gene transfer in plants (*Agrobacterium* and Microprojectile) (4h)
12. Production of transgenic plants and application of transgenic in crop improvement: Bt-cotton and Brinjal. (2h)


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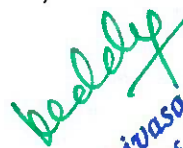

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References:

1. Balasubramanian, D., C. F. A. Bryce, K. Dharmalingam, J. Green and K. Jayaraman. 2004.
2. Biotechnology. Universities Press (India) Private Limited, Hyderabad.
3. Channarayappa. 2007. Molecular Biotechnology – Principles and Practices. Universities Press (India) Private Limited, Hyderabad.
4. Chawala, H. S. 2002. Introduction to Plant Biotechnology. Oxford & IBH Publishing Company, New Delhi.
5. Dubey, R. C. 2001. A Textbook of Biotechnology. S. Chand & Company Ltd., New Delhi
6. Edmond, J. B., T. L. Senn, F. S. Adrews and R. J. Halfacre. 1977..
7. Jha, T.B. and B. Ghosh. 2005. Plant Tissue Culture – Basic and Applied. Universities Press (India) Private Limited, Hyderabad..
8. Ramawat, K. G. 2008. Plant Biotechnology. S. Chand & Company Ltd., New Delhi.
9. Salisbury, F. B. and C. W. Ross. 1992. Plant Physiology. 4th edn. (India Edition), Wordsworth, Thomson Learning Inc., USA..


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B.SC (CBCS) BOTANY- III YEAR
Semester-VI: Elective-III
TISSUE CULTURE & BIOTECHNOLOGY
Theory Model Question Paper

Time : 2 hrs

Max. Marks: 70

Instructions to the candidates: Draw neat labeled diagrams wherever necessary.

SECTION A

5 X 2 = 10M

Define or explain ALL of the following:

- 1.
- 2.
- 3.
- 4.
- 5.

SECTION B

(Instructions to the question PAPER SETTER: Set atleast ONE question for EACH UNIT of the given syllabus)

Write short answer for FOUR of the following

4 X 5 = 20 M

- 6.
- 7.
- 8.
- 9.
- 10.
- 11.

SECTION C

(Instruction to the question PAPER SETTER : Set atleast TWO question from EACH UNIT of the given syllabus.)

Write detailed answers for ALL of the following:

4 X 10 = 40 M

Unit - I

12 . a)

OR

b)

Unit - II

13 . a)

OR

b)

Unit - III

14 . a)

OR

b)

From Any Unit

15 . a)

OR

b)

B. Sc (CBCS) Botany-III Year
Semester-VI: Elective-III
Tissue Culture and Biotechnology

Practical Syllabus

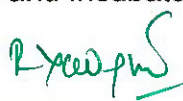
30 Hours

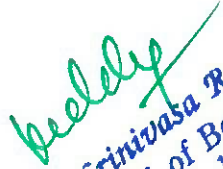
Major Experiments

1. Isolation of plant DNA. (Tomato) (4h)
2. Production of synthetic seeds /Encapsulation of embryo (2h)
3. Preparation of plant tissue culture medium. (4h)

Minor Experiments

4. Callus induction (2h)
5. Demonstration of Micro propagation/ multiple shoots (4h)
6. Anther culture (2h)
7. PCR –Demonstration (2h)
8. Study of biotechnology products: Samples of antibiotics and vaccines (4h)
9. Photographs of Gene transfer methods. (2h)
10. Instruments used in Biotechnology lab- Autoclave, Laminar air flow, Hot air oven and Incubator. (4h)


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**B.Sc (CBCS) Botany-III Year
Semester-VI: Elective III
Tissue Culture and Biotechnology**

Time: 2 hrs

Practical Model Paper

Max. marks : 50

I. Major Experiment (Any two Qs out of three) (2X12) =24 marks

- a) Isolation of DNA
- b) Production of synthetic seeds /Encapsulation of embryo
- c) Preparation of plant tissue culture medium

2. Minor Experiment (7 marks)


Callus Induction/ Micropropagation/ Multiple shoots


3. Spotters (3x3) =9 marks

- A. Vaccines
- B. Antibiotics
- C. Gene transfer method/ Instruments

4. Record (5 marks)

5. Viva (5 Marks)


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