

NAGARJUNA GOVERNMENT COLLEGE

(Autonomous), NALGONDA

(Re accredited by NAAC with 'A' Grade)

BOARD OF STUDIES MEETING - 2020



DEPARTMENT OF BOTANY

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

2020-2021

NAGARJUNA GOVERNMENT COLLEGE (Autonomous), NALGONDA

Re accredited by NAAC with 'A' Grade

DEPARTMENT OF BOTANY

BOARD OF STUDIES MEETING - 2020

CONSTITUTION OF BOARD OF STUDIES

The Board of studies in the Department of Botany is constituted with the following members for the academic year 2020-21.

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. Dr. Ch. Rama Raju Asst .Prof of Botany	Dept of Botany GDC, Ramannapet, Yadadri. Dept of Botany GDC, Devarakonda.
4.	Faculty members of Department	1. Ashraf Ali (Asst.Prof of Botany) 2.R. Swapna (Contract Lecturer) 3. A. Raju (Contract Lecturer) 4. S. Shankar (Contract Lecturer) 5. D.Krishna(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 Govt. College
(Autonomous) NALGONDA

NAGARJUNA GOVERNMENT COLLEGE (Autonomous), NALGONDA

Re accredited by NAAC with 'A' Grade
(Affiliated to Mahatma Gandhi University)
DEPARTMENT OF BOTANY
BOARD OF STUDIES MEETING – 2020-2021

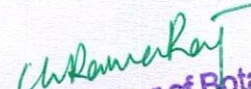
The Board of studies meeting of Botany Department is held on 12 - 11 -2020 in the Department of Botany to discussed the Agenda and formulated the following resolutions.

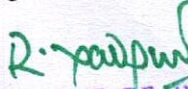
Agenda:

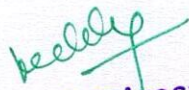
1. To consider and approve the new syllabus (CBCS) of B. Sc II year (III & IV semesters) for the academic year 2020 -21.
2. To consider the syllabus for Skill Enhancement Course (SEC) for 2nd year (III & IV semesters).
3. To consider and approve the syllabus of B. Sc III year (V &VI semesters) for the students admitted in the year 2018 – 19.
4. To consider and approve the syllabus for Generic Elective (Food Adulteration) for V semester.
5. To approve the syllabus for introduction of Project work / Advanced course for 4 credits in VI Semester.
6. To conduct Two Internal assessments for 30 marks for each semester (i.e, 20 Marks for Written Examinations, 5 Marks for Assignment and 5 Marks for Student Seminars) and semester end exams for 70 Marks.
7. To consider and approve the model question papers for B. Sc all semesters.
8. To consider and approve to conduct practical exams semester wise for all the year Students for 50 marks for each paper.
9. To consider and approve the list of Panel of examiners for paper setting and evaluation.
10. Any other related academic matters.

Resolutions:

1. It is resolved to approve the new syllabus (CBCS) for II year (III &IV Sem) for the academic year 2020 -21.
2. It is resolved to approve the syllabus of SEC for III & IV semesters.
3. It is resolved to approve the syllabus of B.sc III Year (V & VI semesters).
4. It is resolved to approve DSE - 1, i.e., "**Cell Biology and Genetics**" for semester-V and DSE - 2, i.e., "**Plant Physiology**" for semester-VI in III year course.
5. It is resolved to approve the syllabus for the course of Generic Elective for V semester.
6. It is resolved to approve the syllabus for Advanced Botany (Tissue Culture and Bio Technology) for VI semester.
7. 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.
8. Approved the model question papers for B. Sc all semesters.
9. Approved the Panel of examiners for paper setting and evaluation.


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Dist. Nalgonda - 508 112


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10. Approved to conduct practical exams semester wise for all the year students for 50 marks for each paper.

Members Present:

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

[Signature]
Assistant Professor
Department of Botany
Nagarjuna Government College
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2. Dr. K. Srinivas Reddy
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3. Dr. R. Yadagiri
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4. Dr. Ch. Rama Raju
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4. Members from the Department:

1. Ashraf Ali (Asst. Prof)
2. R. Swapna (contract)
3. A. Raju (contract)
4. S. Shankar (contract)
5. D. Krishna (contract)

[Signatures]

NAGARJUNA GOVERNMENT COLLEGE (Autonomous), NALGONDA

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DEPARTMENT OF BOTANY

BOARD OF STUDIES MEETING - 2020

Paper setters and Panel of examiners for the academic year 2020-2021

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		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.
		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

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6	III	1	D. Srihari Reddy Asst. Prof of Botany GDC, Patancheru, Hyd. Mobile No: 9441564471 Email ID: devarrintisrihareddy5@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
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NAGARJUNA GOVERNMENT DEGREE COLLEGE (A), NALGONDA

PROPOSED CBCS COMMON CORE SCHEME FOR B.S.C. 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 : Medical Diagnostics	SEC-1	2	2
BS 302	SEC-2 : Nursery and Gardening	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 : Mushroom Cultivation Technology	SEC-3	2	2
BS 402	SEC - 4 : Food Adulteration	SEC-4	2	2
BS 404	PAPER - IV : Cell Biology, Genetics and Plant Physiology	DSC - 1D	4T+2P=6	4+1=5
THIRD YEAR SEMESTER - V				
BS 501	GE : Food Adulteration	GE	4T	4
BS 502	DSE- 1A : Ecology and Biodiversity	DSE - 1A	4+2 = 6	4+1=5
	DSE- 1B : Economic Botany	DSE - 1B		
	DSE- 1C : Cell Biology and Genetics	DSE - 1C		
THIRD YEAR SEMESTER - VI				
BS 601	Tissue Culture and Bio Technology	Optional	4	4
BS 602	DSE-2A : Plant Physiology	DSE - 2A	4+2=6	4+1=5
	DSE-2B: Plant Molecular Biology	DSE - 2B		
	DSE-2C: Seed Technology	DSE - 2C		

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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

Credit - 4

(60 hours)

UNIT - I

(15 hours)

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) Mastigomycotina- *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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References:

1. Alexopolous, J. and W. M. Charles. 1988. Introduction to Mycology. Wiley Eastern, New Delhi.
2. Mckane, L. and K. Judy. 1996. Microbiology – Essentials and Applications. McGraw Hill, New York.
3. 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.
4. Pandey, B. P. 2007. Botany for Degree Students: Diversity of Microbes, Cryptogams, Cell Biology and Genetics. S. Chand & Company Ltd, New Delhi.
5. Sambamurthy, A. V. S. S. 2006. A Textbook of Plant Pathology. I. K. International Pvt. Ltd., New Delhi.
6. Sambamurthy, A. V. S. S. 2006. A Textbook of Algae. I. K. International Pvt. Ltd., New Delhi.
7. Sharma, O. P. 1992. Textbook of Thallophyta. McGraw Hill Publishing Co., New Delhi.
8. Thakur, A. K. and S. K. Bassi. 2008. A Textbook of Botany: Diversity of Microbes and Cryptogams. S. Chand & Company Ltd, New Delhi.
9. Vashishta, B. R., A. K. Sinha and V. P. Singh. 2008. Botany for Degree Students: Algae. S.Chand& Company Ltd, New Delhi.
10. Vashishta, B. R. 1990. Botany for Degree Students: Fungi, S. Chand & Company Ltd, New Delhi.
11. Dutta A.C. 2016. Botany for Degree Students. Oxford University Press.
12. Waston, E.V. 1974. The structure and life of Bryophytes, B.I. Publications New Delhi.
13. Pandey, B.P. 2016. College Botany, Vol.II: Pteridophyta, Gymnosperms and Paleobotany. S. Chand & Company Ltd, New Delhi.
14. Vashishta, P.C., A.K. Sinha and Anil Kumar. 2006. Botany- Pteridophyta (Vascular Cryptogams). Chand & Company Ltd, New Delhi.
15. 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.
16. Pandey, B.P. 2007. Botany for Degree Students: Diversity of Microbes, Cryptogams, Cell Biology, and Genetics. S. Chand & Company Ltd, New Delhi.
17. Thakur, A.K. and S.K. Bassi. 2008. A Text Book of Botany : Diversity of Microbes and Cryptogams. S. Chand & Company Ltd, New Delhi.
18. Vashishta, B.R., A.K. Sinha and Adarsha Kumar. 2008. Botany for Degree Students: Bryophyta. S. Chand & Company Ltd, New Delhi.

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

(30 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 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**

5. Identify the given specimen ' K' & Slide 'L'
(Bryophytes & Lichens) **2x2 = 4M**

7. Record. **1X5 =5 M**

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

Environmental Studies

AECC (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:

- 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.

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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)
- (b)
6. (a)
- (b)

OR

OR

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R. Prasad

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, Xerophytes and Mesophytes.
12. Plant Succession serial stages, modification of environment, climax formation with reference to Hydrosere and Xerosere.

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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). S. 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.
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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

b)

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

(30 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 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 / Hydrophytes) 2 X 3 = 6M

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

6. Herbarium 3M

- 7 . Record 5M

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

DSC-1C (4 hrs./week)	Theory syllabus	Credits-4 (60 hours)
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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. (6h)
3. Leaf: Ontogeny, diversity of internal structure; stomata and epidermal outgrowths. (6 h)
4. General account of adaptations in xerophytes and hydrophytes. (3h)

UNIT-II

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

UNIT - III

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

UNIT-IV

11. Pollen morphology, pollination and fertilization, Pollination Types,
 Pollen - pistil interaction, Double fertilization. (4h)
12. Seed – structure appendages and dispersal mechanisms
13. Endosperm - Development and types. Embryo - development and types;
 Polyembryony and Apomixis - an outline. (5h)

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References:

1. Bhattacharya et. al. 2007. A textbook of Palynology, Central, New Delhi.
2. Bhojwani, S. S. and S. P. Bhatnagar. 2000. The Embryology of Angiosperms (4th Ed.), Vikas Publishing House, Delhi.
3. M.R.Saxena- A textbook of Palynology.
4. Vashista- A textbook of Anatomy.
5. P.K.K.Nair- A textbook of Palynology.
6. Esau, K. 1971. Anatomy of Seed Plants. John Wiley and Son, USA.
7. Johri, B. M. 1984. Embryology of Angiosperms. Springer-Verleg, Berlin.
8. Kapil, R. P. 1986. Pollination Biology. Inter India Publishers, New Delhi.
9. Maheswari, P. 1971. An Introduction to Embryology of Angiosperms. McGraw Hill Book Co., London.
10. Dutta A.C. 2016. Botany for Degree Students. Oxford University Press.

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**B.Sc (CBCS) Botany- I year
Semester-III - Paper-III
(Plant Anatomy and Embryology)
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
Plant Anatomy, Embryology and Palynology

Practical syllabus

(30 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 - <i>Cicer, Canna</i> ; Stem – <i>Tridax, Sorghum</i> | (6 h) |
| Secondary structure: Root – <i>Tridax</i> sp.; Stem – <i>Pongamia</i> | |
| 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 - <i>Hibiscus, Acacia</i> and Grass). | (3 h) |
| 8. Pollen viability test using Evans Blue – <i>Hibiscus</i> | (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 <i>Cymopsis / Senna / Crotalaria</i>) | (3 h) |

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B.SC (CBCS) BOTANY- II YEAR
Semester - III – Paper - III
Plant Anatomy and Embryology
Practical Model Paper

Time: 2 hrs

Max. marks : 50

1. Identify the given material "A", Prepare a double stained permanent mount of transverse section of given material. 15M
2. Prepare a temporary mount of epidermal peel of the given leaf material " B " and identify the stomatal type . 7M
3. Conduct the pollen viability test " C " (OR) Isolate the embryo from the given material . 6M
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 5M
6. Viva 5M

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B.SC (CBCS) BOTANY- II YEAR
Semester – III – Paper - III
Skill Enhancement Course

SEC - 1 (2 hrs / week)

(Credits – 2)

Medical Diagnostics (SEC - I)

**Unit – I: Introduction to medical diagnostics , Diagnostic methods
for analysis of blood and urine**

1. Introduction to medical diagnostics and its importance
2. Blood composition ,Leishman 's staining, Platelet count using haemocytometer, Erythrocyte sedimentary Rate (ESR) , Packed cell volume (P.C.V)
3. Urine analysis Physical characteristics , abnormal constituents.

Unit - II: Non – infection , Infection diseases & Tumours.

4. Non – infection diseases – causes , types , symptoms , complications , diagnosis and prevention of diabetes (type – I & II) , Hypertension (Primary & Secondary), testing of blood glucose using glucometer / Kit.
5. Infections diseases – causes , types, symptoms complication, diagnosis and Prevention of tuberculosis and hepatitis.
6. Tumours – Types (Benign, Malignant), detection & metastasis.

Suggested Readings:

1. Prakash, G.(2012). Lab Manual on Blood analysis and Medical Diagnostics. S. Chand and Co. Ltd., New Delhi.

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Medical Diagnostics (SEC)

Semester – III

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- II YEAR
Semester – III – Paper - III
Skill Enhancement Course

SEC – 2 (2hrs / week)

(Credits – 2)

Nursery and Gardening

Lectures: 30

Unit – I

1. Nursery : definition, objectives, and scope and building up of infrastructure for nursery, planning and seasonal activities- planting- direct seeding and transplants.
2. Seed: Structure and types – seed dormancy; causes and methods of breaking dormancy – seed technology – seed testing and certification.
3. Vegetative propagation: air layering, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cutting- hardening of plants- green house – mist chamber, shed root, shade house and glass house.

Unit – II

4. Gardening: definition, objectives, and scope – different types of gardening – land scape and home gardening- parks and its components- plant material land design- computer applications in landscaping – gardening operations: soil laying, manuring, watering, management of pests and diseases and harvesting.
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. Features of a garden : Garden wall, Fencing, biofencing, Steps, Hedge, Edging, Lawn, Flower beds, Shrubbery, Borders, Water garden. Some famous gardens of India. Cultivation of important cut flowers: Carnation, Asters, Chrysanthemum, Dahlia, Gerbera, Gladiolus, Marigold, Rose, Liliun, Orchids.

- Field trip is essential.

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, Nagarecoil.
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 (SEC)
Semester - III
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. Botany
II YEAR : Semester- IV

Paper IV : Cell Biology, Genetics and Plant Physiology

DSC-1D

Credits - 4

Theory Syllabus

60 hours

Unit - I:

1. Plant cell envelops: Ultra structure of cell wall, Models of membrane structure, Structure and functions of Semi permeable Plasma membrane.
2. Cell Organelles : Structure and semiautonomous nature of Mitochondria and Chloroplast.
3. Nucleus: Ultra structure, types and functions of DNA & RNA. Mitochondrial DNA & Plastid DNA & Plasmids.
4. Chromosomes: Morphology, organization of DNA in a chromosome, Euchromatin and Heterochromatin, Karyotype. Special types of chromosomes: Lampbrush and Polytene chromosomes.
5. Cell division: Cell and its regulation; mitosis, meiosis and their significance.

Unit - II:

6. Mendelism: History, Principles of inheritance, Chromosome theory of inheritance, Autosomes and sex chromosomes, Incomplete dominance and Co-dominance. Multiple alleles, Lethal alleles, Epistasis, Recessive and Dominant traits, Polygenic inheritance.
7. Linkage and Crossing over, Recombination frequency, two factor and three factor crosses Interference and coincidence. Numericals based on gene mapping ; Sex Linkage.
8. Variation in chromosome number and structure : Deletion, Duplication, Inversion, Translocation, Position effect, Euploidy and Aneuploidy.
9. Gene mutations : Types of Mutations, molecular basis of Mutations; Mutagens- Physical and chemical (Base analogs, deaminating, alkylating and intercalating agents.)

Unit - III:

10. Plant – water relations: Water potential, osmosis, osmotic and pressure potential, absorption and transport of water.
11. Mineral Nutrition : Essential micro & macro nutrients and symptoms of mineral deficiency.
12. Transpiration : Stomatal structure and movement.
13. Mechanism of phloem transport.
14. Enzymes : Nomenclature, properties, classifications and factors regulating enzyme activity.

Unit – IV

15. Photosynthesis : Photosynthetic pigments, Cyclic and Non – cyclic Photophosphorylation. Carbon assimilation pathways: C3, C4 and CAM.
16. Respiration : Aerobic and Anaerobic; Glycolysis, Krebs' cycle and Oxidative phosphorylation.
17. Nitrogen metabolism: Biological nitrogen fixation.
18. Physiological role of Phytohormones: Auxins, gibberellins, cytokinins, ABA, ethylene and Brassinosteroids.

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References:

1. Sharma, A. K. and A. Sharma. 1999. Plant Chromosomes: Analysis, Manipulation and Engineering. Harward Academic Publishers, Australia.
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.
7. Hopkins, W. G. 1995. Introduction to Plant Physiology. John Wiley & Sons Inc., New York, USA
8. Jain, J.L., S. Jain and Nitin Jain. 2008. Fundamentals of Biochemistry. S. Chand & Company Ltd., New Delhi.
9. Pandey, B. P. 2007. Botany for Degree Students: Plant Physiology, Biochemistry, Biotechnology, Ecology and Utilization of Plants. S. Chand & Company Ltd., New Delhi.
10. Salisbury, F. B. and C. W. Ross. 1992. Plant Physiology. 4th edn. (India Edition), Wordsworth, Thomson Learning Inc., USA.
11. Taiz, L. and E. Zeiger. 1998. Plant Physiology (2nd Ed.). Sinauer Associates, Inc., Publishers, Massachusetts, USA.
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B.Sc (CBCS) Botany- I year
Semester-IV - Paper-IV
(Cell Biology, Genetics and Plant Physiology)
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. Botany
II YEAR : Semester- IV

Paper IV : Cell Biology, Genetics and Plant Physiology

DSC-1D

Credits-1

Practical Syllabus

(30 hours)

1. Demonstration of cytochemical methods: Fixation of plant material and nuclear staining for mitotic and meiotic studies.
2. Study of various stages of mitosis using cytological preparation of Onion root tips.
3. Study of ultra structure of cell organelles using photographs.
Chloroplast, Mitochondria, Nucleus.
4. Study of Special types of Chromosomes (Polytene chromosome and Lampbrush chromosomes-Permanent slide).
5. Mendel's laws through seed ratios. Laboratory exercises in probability and chi- square analysis.
6. Chromosome mapping using test cross data.
7. Incomplete dominance and gene interaction through seed ratios
(9:7, 9:6:1, 13:3, 15:1, 12:3:1, 9:3:4)
8. Determination of osmotic potential of vacuolar sap by Plasmolytic method using leaves of *Rheodiscolor / Tradescantia*.
9. Determination of rate of transpiration using Cobalt chloride method.
10. Determination of stomatal frequency using leaf epidermal peelings / Impressions.
11. Determination of amylase activity using potato tubers by titration method
12. Separation of chloroplast pigments using paper chromatography technique.
13. Estimation of protein by Biurette method.
14. Mineral deficiency- Detail study of Micronutrients and Macro nutrients.

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B.Sc. Botany
II Year : Semester- IV

Cell Biology, Genetics and Plant Physiology

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. (12M)
2. Genetic problems. (10M)
3. Physiology Experiment (12M)
4. Identify and Comment on A & B (2x3=6M)
 - A. Micronutrient / Macronutrient Deficiency symptoms
 - B. Cell organelles / Special type of chromosomes
5. Record (5M)
6. Viva (5M)

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B.SC (CBCS) BOTANY- II YEAR
Semester – VI – Paper - IV
Skill Enhancement Course

SEC – 3(2 hrs / week)

(Credits – 2)

Mushroom Culture Technology

Lectures : 30

Unit – I

1. Introduction & history, Medical value of edible mushrooms, Poisonous mushrooms. Types of edible mushrooms available in India – Volvariella volvacea, Pleurotus citrinopileatus, Agaricus bisporus.
2. 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 bags.
3. Pure culture: Medium, sterilization, preparation of spawn, multiplication. Mushroom bed preparation- paddy straw, sugarcane trash, maize straw, banana leaves.
4. Factors affecting the mushroom bed preparation - Low cost technology, Composting technology in mushroom production.

Unit – II

5. Storage : Short term storage (Refrigeration – upto 24 hours) Long term Storage (Canning, pickles, papads), drying, storage in salt solutions.
6. Nutritional value of Mushrooms: Proteins – amino acids, mineral elements nutrition- Carbohydrates, Crude fibre content – Vitamins.
7. Food Preparation: Types of food prepared from mushroom. Research Centres – National level and Regional level. Cost benefit ratio - Marketing in India and abroad. Export Value.

Suggested Readings

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.,No.88, Mysore Road, Bangalore – 560018.
3. Tewari, Pankaj Kapoor, S.C.,(1988). Mushroom cultivation , Mittal Publications, Delhi.
4. Nita Bahl (1984 – 1988) Hand book of Mushrooms, II Editiona, Vol.I & Vol.II.

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Mushroom Culture Technology(SEC)
Semester – IV
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- II YEAR
Semester – IV – Paper - IV
Skill Enhancement Course

SEC – 4 (2 hrs / week)

(Credits – 2)

Food Adulteration

Unit – I

Definitation and Introduction of food adulteration.

Types of Food Adulteration.

Common Food Adulteration.

Causes of Food Adulteration.

Analysis of food

UNIT – II

Effects of Food Adulteration

Prevention of Food adulteration

Detection of Common food Adulterants.

Food Adulteration act – 1954

Reference :

1. Jesse Park Battershall. Food adulteration and its detection . Published by Book on Demand , Miami, 2015
2. R . B. Sethi 's Prevention of food adulterantion act
3. Dr.Sheela .S. Prevention of Food Adulteration.

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Food Adulteration (SEC)

Semester – IV

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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References:

1. Sharma, A. K. and A. Sharma. 1999. Plant Chromosomes: Analysis, Manipulation and Engineering. Harward Academic Publishers, Australia.
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)

Unit - IV

15 . a)

OR

b)

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

DSE -1E

Credit – 1

(30 hours)

Practical Syllabus

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

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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
6. Record (5 Marks)
7. Viva (5 Marks)

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B.Sc. Botany- III Year
Semester-V
Generic Elective

GE(4 hrs / week)

Food Adulteration

credits – 4

Unit – I

Definitation and Introduction of food adulteration.

Types of Food Adulteration.

Common Food Adulteration.

Causes of Food Adulteration.

Analysis of food

UNIT – II

Effects of Food Adulteration

Prevention of Food adulteration

Detection of Common food Adulterants.

Food Adulteration act – 1954

Reference :

1. Jesse Park Battershall. Food adulteration and its detection . Published by Book on Demand , Miami, 2015.
2. R . B. Sethi 's Prevention of food adulteration act.
3. Dr.Sheela .S. Prevention of Food Adulteration.

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Food Adulteration (GE)

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.

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B.Sc. (CBCS) Botany: III Year

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

DSE-1F (4hrs./week) Core

Credits-4

Theory Syllabus

(60 hours)

UNIT – I

15 hours

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.
2. Mineral Nutrition: Essential macro and micro mineral nutrients and their role; symptoms of mineral deficiency.
3. Translocation of organic substances: Mechanism of phloem transport.

UNIT- II

15 hours

4. Enzymes: Nomenclature, Characteristics, Classification, Mechanism and regulation of enzyme action, factors regulating enzyme activity.
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.
6. Carbon assimilation pathways: C₃, C₄ and CAM.

UNIT – III

15hours

7. Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron transport system, mechanism of oxidative phosphorylation, pentose phosphate pathway.
8. Nitrogen Metabolism: Biological nitrogen fixation, nitrate reduction, ammonia assimilation (GS-GOGAT transamination)
9. Lipid Metabolism: Structure and Function of Lipids.

UNIT – IV

15hours

10. Growth and Development: Physiological effects of phytohormones—Auxins, gibberellins, cytokinins, ABA, ethylene and Brassinosteroids
11. Physiology of flowering and photoperiodism. Role of Phytochrome in flowering.
11. Stress physiology: Concept of water, salt and temperature stresses and plant responses.

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References:

1. Hopkins, W. G. 1995. Introduction to Plant Physiology. John Wiley & Sons Inc., New York, USA
2. Jain, J.L., S. Jain and Nitin Jain. 2008. Fundamentals of Biochemistry. S. Chand & Company Ltd., New Delhi.
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 : 2¹/₂ 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)

Unit IV

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*.
2. Determination of rate of transpiration using Cobalt chloride method.
3. Determination of stomatal frequency using leaf epidermal peelings / Impressions.
4. Determination of catalase activity using potato tubers by titration Method.
5. Separation of chloroplast pigments using paper chromatography Technique.
6. Estimation of protein by Biurette method.
7. Mineral deficiency- Detail study of Micronutrients and Macro nutrients.
8. Identification of C₃, C₄ and CAM plants.

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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 :

(12 marks)

Major Experiment – II :

(12 marks)

II. Minor Experiment:

(10 marks)

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

(4 hrs./week) Theory Syllabus Credits-4

(60 hours)

UNIT – I

(15hrs)

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

UNIT- II

(15hrs)

4. Somatic hybrids and Cybrids.
5. Applications of tissue culture: Production of pathogen free plants and somaclonal variants, production of stress resistance plants, secondary metabolites and synthetic seeds.
6. Induction of hairy roots and its applications in production of secondary metabolites.

UNIT- III

(15hrs)

7. Biotechnology: Introduction, history, scope and applications.
8. rDNA technology: Basic aspect of of gene cloning, Enzymes used in gene cloning-Restriction enzymes, Ligases, Polymerases.
9. Gene cloning-Vectors – cloning vehicles (Plasmid , Cosmids, Bacteriophages , & Phasmids) application of r DNA technology.

UNIT- IV

(15hrs)

10. Gene Libraries: Genomic Libraries, cDNA Libraries, Polymerase chain reaction and its applications.
11. Method of gene transfer in plants (*Agrobacterium* and Microprojectile)
12. Production of transgenic plants and application of transgenic in crop improvement: Bt-cotton and Brinjal.

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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
4. (India) Private Limited, Hyderabad.
5. Chawala, H. S. 2002. Introduction to Plant Biotechnology. Oxford & IBH Publishing Company, New Delhi.
6. Dubey, R. C. 2001. A Textbook of Biotechnology. S. Chand & Company Ltd., New Delhi
7. Edmond, J. B., T. L. Senn, F. S. Adreus and R. J. Halfacre. 1977..
8. Jha, T.B. and B. Ghosh. 2005. Plant Tissue Culture – Basic and Applied. Universities Press (India) Private Limited, Hyderabad..
9. Ramawat, K. G. 2008. Plant Biotechnology. S. Chand & Company Ltd., New Delhi.
11. 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
TISSUE CULTURE & BIOTECHNOLOGY
Theory Model Question Paper

Time : 2 1/2 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)

Unit -IV

15 . a)

OR

b)

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