

**NAGARJUNA GOVERNMENT COLLEGE**

**(Autonomous), NALGONDA**

**BOARD OF STUDIES -2021**



**DEPARTMENT OF BOTANY**

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

**2021-2022**

**NAGARJUNA GOVERNMENT COLLEGE (Autonomous), NALGONDA**  
**DEPARTMENT OF BOTANY**

Date: 01-09-2021

To  
The Principal,  
Nagarjuna Govt. Degree College (A),  
Nalgonda.

Sir,

Sub: Grant of Autonomous status –Constitution of the Board of Studies in Botany  
Department – request for approval – Reg.

Ref: 1.No.F. 22-1/2007 (AC) Dt.3 APR 2007

2. OU Lr . NoMR . 69/ H /2007/Acad, Dt: 12-6-07

3. Govt.No.467 HE. (CE-1) Dept. Dt: 29-6-07

4. MGU Lr. No: 704 / NGC / Academic / 2021, Date: 08-07-2021.

-oOo -

With reference to the subject cited, I am here with submitting the list of committee members for Constitution of the Board of Studies for the academic year 2021-2022 for your approval.

S.No	CATEGORY	NAME & DESIGNATION	CONTACT NUMBER
1	Chairman Board of studies	A.Sandhya Asst.Prof.of Botany N.G College, Nalgonda	9885340324
2	University nominee	Dr. N. Chandra Babu Asst.Prof.of Botany, KRR Govt. Degree college, Kodad.	9347848463
3	Subject Expert-I	Dr. K. Srinivas Reddy Asst.Prof of Botany GDC(W), Nalgonda	9948536070
4	Subject expert -II	Dr. R.Yadagiri Asst.Prof of Botany GDC , Ramannapet, Yadadri	9948649049

Submitted by  
In charge/ Chairman BOS

*(Signature)*  
Assistant Professor  
Department of Botany  
Nagarjuna Government College  
NALGONDA

*(Signature)*  
Proposals approved by  
Principal/Chairman Academic Council.  
(Autonomous) NALGONDA.

**NAGARJUNA GOVERNMENT COLLEGE (Autonomous), NALGONDA**  
**DEPARTMENT OF BOTANY**  
**BOARD OF STUDIES MEETING - 2021**  
**COMPOSITION OF BOARD OF STUDIES**

The Board of Studies in the Department of Botany is constituted with the following members for the academic year 2021-22.

S.NO	CATEGORY	NAME & DESIGNATION	ADRESS/MAIL/PHONE
1.	<b>Chairman, Board of Studies</b>	<b>A.Sandhya</b> <b>In- Charge</b> Assistant Professor Department of Botany Nagarjuna Government college, Nalgonda.	Department of Botany Nagarjuna Government College, Nalgonda.
2.	<b>University Nominee</b>	<b>Dr. N. Chandra Babu</b> Asst.Prof of Botany	Dept. of Botany K.R.R Govt. Degree college Kodad
3.	<b>Subject Experts</b>	1.Dr.K. Srinivas Reddy Asst.Prof of Botany  2. Dr. R.Yadagiri Asst. Prof of Botany	Dept. of Botany GDC (W), Nalgonda.  Dept. of Botany GDC, Ramannapet, Yadadri.
4.	<b>Faculty members of Department</b>	1 .MD. Ashraf Ali 2.D. Krishna 3.R.Swapna 4.S.Shankar	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.**

10

# NAGARJUNA GOVERNMENT COLLEGE (Autonomous), NALGONDA

## DEPARTMENT OF BOTANY BOARD OF STUDIES MEETING -2021-2022

The Board of studies meeting of Botany Department is held on 08-09-2021 in the Department of Botany to discuss the Agenda and formulated the following resolutions.

### Agenda:

1. To approve the continuation of B.Sc Botany syllabus (CBCS) of I, II, III & IV semesters for the academic year 2021 -22.
2. To approve the syllabus of AECC-Environmental Studies in I-semester.
3. To approve the continuation of the Skill enhancement courses (SEC) for II-year (III & IV semester).
4. To approve the syllabus of B.Sc III-year V & VI Semesters as follows  
V semester. Elective-I A: Biodiversity and Conservation.  
Elective-I B: Economic Botany.  
VI semester Elective-II A: Tissue Culture & Biotechnology.  
Elective-II B: Analytical Techniques in Plant Sciences
5. To approve the syllabus for Generic Elective **Industrial Microbiology** for V semester.
6. To approve the syllabus for Introduction of Project Work/ Advanced Course for 4 credits in VI semester.
7. To conduct Two Internal assessments for 30 marks for each semester (i.e,20 marks for written examinations, 5marks for Assignment and 5 marks for student Seminars) and semester end exams for 70 Marks.
8. To approve the model question papers for B. Sc all semesters.
9. To approve the conduct of practical exams semester wise for all the year students for 50 marks for each paper.
10. To approve the list of Panel of examiners for paper setting and evaluation.
11. Any other related academic matters.

### Resolutions:

1. It is resolved to approve the continuation of B.Sc Botany syllabus (CBCS) of I, II, III & IV semesters for the academic year 2021 -22.
2. It is resolved to approve the syllabus of AECC-Environmental Studies in I semester.
3. It is resolved to approve the continuation of Skill Enhancement Course (SEC) for II year (III & IV semester).
4. It is resolved to approve the syllabus of B.Sc III year (V & VI semester).  
V semester. Elective-I A: Biodiversity and Conservation.  
Elective-I B: Economic Botany.  
VI semester Elective-II A: Tissue Culture & Biotechnology.  
Elective-II B: Analytical Techniques in Plant Sciences
5. It is resolved to approve the syllabus for the course of Generic Elective (Industrial Microbiology) for V semester.
6. It is resolved to approve the syllabus of Project Work / Advanced Course of Botany for 4 Credits in VI semester.

*beelby*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Jegre College (W)  
ONDA-508 206, T.S.

*R. purpura*

*NR*  
**Dr. N. CHANDRA BABU, F**  
Asst. Professor of Botany  
CRR Govt. Arts & Science Colleg  
KODAD-508 206, T.S.

- 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.
- 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  
 NALGONDA

2. Dr .N. Chandra Babu  
 Asst. Prof. of Botany  
 Department of Botany  
 KRR Govt. Degree College, Kodad

*[Signature]*  
**Dr. N. CHANDRA BABU, Ph.D.**  
 Asst. Professor of Botany  
 KRR Govt. Arts & Science College  
 KODAD-508 206, T.S.

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

*[Signature]*  
**Dr. K. Srinivasa Reddy**  
 Asst. Prof. of Botany  
 Govt. Degree College (W),  
 NALGONDA-508001. T.S.

4. Dr. R.Yadagiri  
 Asst.Prof. of Botany  
 Department of Botany  
 GDC, Ramannapet, Nalgonda

*[Signature]*  
**R. YADAGIRI**  
 DEPARTMENT OF BOTANY  
 Govt. Degree College, Ramannapet,  
 Dist. Nalgonda - 508 112

**Members of the Department:** 1. MD. Ashraf Ali

- 2. D. Krishna *[Signature]*
- 3. R. Swapna *[Signature]*
- 4. S. Shankar *[Signature]*

# NAGARJUNA GOVERNMENT DEGREE COLLEGE (A), NALGONDA

## PROPOSED CBCS COMMON CORE SCHEME FOR B.SC COURSE OPTIONAL- 1: BOTANY

CODE	PAPER TITLE	COURSE TYPE	HPW	CREDITS
<b>FIRST YEAR SEMESTER –I</b>				
BS 104	<b>PAPER I</b> –Microbial Diversity and Lower Plants AECC – Environmental studies	DSC-1A AECC	4T+2P=6 2	4+1=5 2
<b>FIRST YEAR SEMESTER –II</b>				
BS 204	<b>PAPER II</b> –Gymnosperms ,Taxonomy of Angiosperms and Ecology	DSC-1B	4T+2P=6	4+1=5
<b>SECOND YEAR SEMESTER –III</b>				
BS 301	<b>SEC-1</b> Nursery And Gardening –	SEC-1	2	2
BS 302	<b>SEC-2</b> Bio fertilizers And – Organic Farming	SEC-2	2	2
BS 304	<b>Paper- III</b> : Plant Anatomy and Embryology	DSC-1C	4T+2P=6	4+1=5
<b>SECOND YEAR SEMESTER –IV</b>				
BS 401	<b>SEC-3:</b> Green House Technology –	SEC-3	2	2
BS 402	<b>SEC-4:</b> Mushroom Culture Technology –	SEC-4	2	2
BS 404	<b>PAPER-IV:</b> Cell Biology, Genetics & Plant Physiology	DSC-1D	4T+2P=6	4+1=5
<b>THIRD YEAR SEMESTER –V</b>				
BS 501	<b>GE-1</b> : Industrial Microbiology –	GE-I	4T	4
BS 502	<b>DSE-1A:</b> Biodiversity & Conservation <b>DSE-1B:</b> Economic Botany	DSE-1A/ DSE-1B/	4T+2P=6	4+1=5
<b>THIRD YEAR SEMESTER –VI</b>				
BS 601	<b>DSE-3: Project /Advanced Course (Cell &amp; Molecular Biology)</b>	<b>Project /Advanced Course</b>	4	4
BS 602	<b>DSE-2A:</b> Tissue Culture And Biotechnology <b>DSE-2B:</b> Analytical Techniques In Plant Sciences	<b>DSE-2A / DSE-2B</b>	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

*R. Srinivas*  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramannapeta  
Dist. Nalgonda - 508 112

*Reddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001, T.S.

*119*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

①

I

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

**Theory Syllabus**

<u>DSC-1A(4hrs./week)</u>	<u>Credits-4</u>
<b>UNIT – I</b>	<b>(60 hours)</b> <b>(15 hours)</b>
1. Bacteria: Structure, nutrition, reproduction, and economic importance. Brief account of Archaeobacteria, 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.	
<b>UNIT- II</b>	<b>(15hours)</b>
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 - <i>Volvox</i> , <i>Oedogonium</i> and <i>Chara</i> . Phaeophyceae - <i>Ectocarpus</i> Rhodophyceae - <i>Polysiphonia</i> .	
<b>UNIT-III</b>	<b>(15hours)</b>
7. General characters and classification of fungi (Ainsworth).	
8. Structure and reproduction of the following: (a) Mastigomycotina - <i>Albugo</i> (b) Zygomycotina - <i>Mucor</i> (c) Ascomycotina - <i>Saccharomyces</i> and <i>Penicillium</i> . (d) Basidiomycotina - <i>Puccinia</i> (e) Deuteromycotina - <i>Cercospora</i> .	
9. Economic importance of Lichens.	
<b>UNIT-IV</b>	<b>(15hours)</b>
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. Stellar evolution, Heterospory and Seed habit in pteridophytes.	

*R. Srinivas*  
**DEPARTMENT OF BOTANY**  
Gov. Degree College, Ramannage  
Dist. Nalgonda - 508 118

*Reddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*KS*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

## 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.

*R. Srinivas*  
DEPARTMENT OF BOTANY  
Govt. Degree College, Ramannagar  
Dist. Nalgonda - 508 118

*Reddy*  
Dr. K. Srinivasa Reddy  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*KR*  
Dr. N. CHANDRA BABU, Ph.D.  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.



**B.Sc I (CBCS) Botany-I year  
Semester-I - Paper-I  
Microbial Diversity and 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 at least 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 at least 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)**

*R. Srinivas*  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramannampeta  
Dist. Nalgonda - 508 112


*keelap*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001, T.S.


*NS*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 276, T.S.


**B.Sc (CBCS) Botany-I year**  
**Semester-I - Paper-I**  
**Microbial Diversity and 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.

  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramannappa,  
Dist. Nalgonda - 508 118.

  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

**B. Sc (CBCS) Botany- I year**  
**Semester-I - Paper-I**  
**Microbial Diversity and 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 'G' & 'H'.  
(Algae-1, Fungi-1) **2 X 2 = 4 M**
6. Identify the given specimen 'I' & Slide 'J' (Bryophytes & Lichens). **2 X 2 = 4 M**
7. Record. **5 M**

*R. Srinivas*  
**DEPARTMENT OF BOTANY**  
Gov. Degree College, Ramachandra  
Dist. Nalgonda - 508 001

*Reddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*19*  
**Dr. N. CHANDRA BABU, Ph.D**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

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.

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.

*R. Srinivasa Reddy*  
DEPARTMENT OF BOTANY  
Govt. Degree College, Ramandrapeta,  
Dist. Nalgonda - 508 118

*keelley*  
Dr. K. Srinivasa Reddy  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508 001, T.S.

*KS*  
Dr. N. CHANDRA BABU, Ph.D.  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

ENVIRONMENTAL STUDIES

Semester – I – Paper - I

Model Question Paper For Semester Examination (End) for AECC

TIME: 2 Hours

MAX MARKS: 40

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)

*Rampur*  
DEPARTMENT OF BOTANY  
Gov. Degree College, Ramana  
Dist. Nalgonda - 508 118

*reddy*  
Dr. K. Srinivasa Reddy  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*NS*  
Dr. N. CHANDRA BABU, Ph.D.  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206. T.S.

NG ✓

**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 Bentham 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, Shenzhen 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, Monochlamydeae :  
Amaranthaceae, Euphorbiaceae
9. Monocotyledons : Orchidaceae, Poaceae and zingiberaceae

**UNIT-IV.**

**15 hrs**

10. Components of ecosystem, 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.

*R. Srinivas*  
 DEPARTMENT OF BOTANY  
 Govt. Degree College, Ramachandrapuram,  
 Dist. Nalgonda - 508 113

*Reddy*  
 Dr. K. Srinivasa Reddy  
 Asst. Prof. of Botany  
 Govt. Degree College (W)  
 NALGONDA-508 001. T.S.

*NS*  
 Dr. N. CHANDRA BABU, Ph.D.  
 Asst. Professor of Botany  
 KRR Govt. Arts & Science College  
 KODAD-508 206, T.S.

## References:

1. Watson, E. V. 1974. The structure and life of Bryophytes, B. I. Publications, New Delhi.
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 (2<sup>nd</sup> 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.

*R. Vaspu*  
DEPARTMENT OF BOTANY  
Govt. Degree College, Ramannapa,  
Dist. Nalgonda - 508 118.

*Reddy*  
Dr. K. Srinivasa Reddy  
Asst. Prof. of Botany  
Govt. Degree College (W)  
Nalgonda - 508 001. T.S.

*19*  
Dr. N. CHANDRA BABU, Ph.D.  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

**B.Sc(CBCS) Botany- I year**  
**Semester-II - Paper-II**  
**(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 at least ONE question for EACH UNIT of the given syllabus)**

**Write short answer for FOUR of the following**

**4 X 5 =20M**

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

**SECTION C**

**(Instruction to the question PAPER SETTER : Set at least 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)

*Dr. K. Srinivasa Reddy*  
**DEPARTMENT OF BOTANY**  
Gov. Degree College, Ramannapeta,  
Dist. Nalgonda - 508 118.

*Dr. K. Srinivasa Reddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*Dr. N. Chandra Babu*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College,  
KODAD-508 206, T.S.



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

**Practical Syllabus**

**(30hours)**

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.

  
**DEPARTMENT OF BOTANY**  
Gov. Degree College, Ramannappa  
Dist. Nalgonda - 508 118.

  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

**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

*Ramesh*

**DEPARTMENT OF BOTANY**  
Gov. Degree College, Ramanaip.  
Dist. Nalgonda - 508 111

*Reddy*


**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*kg*

**Dr. N. CHANDRA BABU.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science Coll.  
KODAD-508 206

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

<u>DSC-1D (4 hrs./week)</u>	<u>Theory syllabus</u>	<u>Credits-4</u> <u>(60 hours)</u>
<b>UNIT – I</b>		<b>(15 hours)</b>
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)
<b>UNIT-II</b>		<b>(15 hours)</b>
5.	Stem and root anatomy: Vascular cambium - Formation and function.	(3h)
6.	Anomalous secondary growth of Stem - <i>Achyranthes, Boerhaavia, Bignonia, Dracaena</i> ; Root- <i>Beta vulgaris</i>	(5h)
7.	Wood structure: General account. Study of local timbers – Teak ( <i>Tectona grandis</i> ), Rosewood, ( <i>Dalbergia latefolia</i> ), Red sanders, ( <i>Pterocarpus santalinus</i> ) Nallamaddi ( <i>Terminalia tomentosa</i> ) and Neem ( <i>Azadirachta indica</i> ).	(7h)
<b>UNIT – III</b>		<b>(15 hours)</b>
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)
<b>UNIT-IV</b>		<b>(15 hours)</b>
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)

  
 DEPARTMENT OF BOTANY  
 Govt. Degree College, Ramannappa,  
 Dist. Nalgonda - 508 118  
  
 Dr. K. Srinivasa Reddy  
 Asst. Prof. of Botany  
 Govt. Degree College (W)  
 NALGONDA-508001. T.S.

  
 Dr. N. CHANDRA BABU, Ph.D.  
 Asst. Professor of Botany  
 KRR Govt. Arts & Science College  
 KODAD-508 206, T.S.

## 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.

*R. Srinivas Reddy*  
**DEPARTMENT OF BOTANY**  
**Govt. Degree College, Ramachandrapuram**  
**Dist. Nalgonda - 508 001**  
**Dr. K. Srinivasa Reddy**  
**Asst. Prof. of Botany**  
**Govt. Degree College (W)**  
**NALGONDA-508 001. T.S.**

*N. Chandra Babu*  
**Dr. N. CHANDRA BABU, Ph.D.**  
**Asst. Professor of Botany**  
**KRR Govt. Arts & Science College**  
**KODAD-508 206, T.S.**

B.Sc (CBCS) Botany- II 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 at least 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 at least 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)

*R. Srinivas*  
DEPARTMENT OF BOTANY  
Govt. Degree College, Ramannage  
Dist. Nalgonda - 508 113.

*Feelely*  
Dr. K. Srinivasa Reddy  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*KS*  
Dr. N. CHANDRA BABU, Ph.D.  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

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

**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</i> , <i>Canna</i> ; Stem - <i>Tridax</i> , <i>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</i> , <i>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</i> / <i>Senna</i> / <i>Crotalaria</i> )                             | (3 h) |

*R. paupus*  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramannapeta,  
Dist. Nalgonda - 508 001

*keeddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*NS*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

**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

*R. Srinivas*  
**DEPARTMENT OF BOTANY**  
Gov. Degree College, Ramannapeta  
Dist. Nalgonda - 508 112

*K. Srinivasa Reddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*N. Chandra Babu*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

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

SEC – 1 (2 Hours/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 net, 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, Gladiolous, Marigold, Rose, Lilium, 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, Nagerecoil.
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 .(3<sup>rd</sup> Ed.), W.H. Freeman and Co., San Francisco, USA.

**DEPARTMENT OF BOTANY**  
Gov. Degree College, Ramannapa,  
Tal. Nalgonda - 508 118.

**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508 001. T.S.

**r. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
NALGONDA-508 206. T.S.



**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.

*R. Srinivas*  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramannay  
Dist. Nalgonda - 508 112.

*Reddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*NG*  
**N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
R Govt. Arts & Science College  
KODAD-508 206, T.S.

**B.SC (CBCS) BOTANY- II YEAR**  
**Semester – III – Paper - III**  
**Skill Enhancement Course**  
**Biofertilizers and Organic Farming**

SEC - 2 (2HOURS/WEEK)

(Credits – 2)

30 hrs

**Unit – I:**

**(15 Hrs)**

1. Manures and Biofertilizers : Types of Fertilizers , manures. Manure composition . Manures for crop productivity.
2. Differences between Fertilizers and Biofertilizers: pH changes and water contamination .
3. Bacterial Biofertilizers: General account on the microbes used as Biofertilizers.
4. Algal Biofertilizers; Associative effect of different micro organisms. Azolla and Anabaena- Azollae association , Nitrogen fixation , Factors affecting growth, Azolla in rice cultivation .

**Unit –II**

**(15Hrs)**

5. Fungal Biofertilizers; Mycorrhizal association , types of mycorrhizal association, occurrence and distribution, Phosphorous nutrition , growth and yield , colonization of VAM- Isolation and inoculum production of VAM and its influence on growth and yield of crop plants.
6. Organic Farming; Green manuring and Organic fertilizers , Recycling of Bio- degradable municipal, Agricultural and Industrial wastes, Biocompost making types , method of vermi composting, Panchakavya. Biological pest control (Neem)

**Suggested Readings:**

1. Dubey R.C.2005. A text book of Biotechnology. S. Chand & Co. NewDelhi
2. Kumaresan V.2005. Biotechnology . Saras publication . New Delhi.
3. John Jothi Prakash E.2004. Outlines of plant Biotechnology. Emkay publication. New Delhi.
4. Sathe T.V.2004. Vemiculture and Organic Farming. Daya publishers . New Delhi.
5. Subha Rao N. S.2000. Soil Microbiology , Oxford &IBH publishers . New Delhi.
6. Vayas .S.C, Vayas S. and Modi H. A. 1998. Biofertilizers and Organic Farming Akta Prakashan. Nadiad.

*R. Prasad*  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramana Rao  
Dist. Nalgonda - 508 119

*Keedip*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508 001. T.S.

*NS*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
RR Govt. Arts & Science College  
KODAD-508 206, T.S.

Biofertilizers and Organic Farming (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.

*R. Srinivas*

DEPARTMENT OF BOTANY  
Govt. Degree College, Ramanaipeta,  
Dist. Nalgonda - 508 112.

*K. Srinivasa Reddy*

Dr. K. Srinivasa Reddy  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508 001. T.S.

*N. Chandra Babu*

Dr. N. CHANDRA BABU, Ph.D.  
Asst. Professor of Botany  
RR Govt. Arts & Science College  
KODAD-508 206, T.S.

NG ✓

**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:**

**(15 Hours)**

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
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.

cycle

**Unit - II:**

**(15 Hours)**

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 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:**

**(15 Hours)**

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 Hours)**

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

*Ramesh*  
DEPARTMENT OF BOTANY  
Gov. Degree College, Ramannappa  
Dist. Nalgonda - 508 113

*Reddy*  
Dr. K. Srinivasa Reddy  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*he*  
Dr. N. CHANDRA BABU, Ph.D.  
Asst. Professor of Botany  
Govt. Arts & Science College  
KODAD-508 206, T.S.

## 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.
12. Dutta A.C. 2016. Botany for Degree Students. Oxford University Press.

*R. Srinivas*  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramanagara  
Dist. Nalgonda - 508 103.

*Reddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*NS*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

**B.Sc (CBCS) Botany- II 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 at least 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 at least 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)

*Ramanna*  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramanna  
Dist. Nalgonda - 508 119.

*Kreddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA - 508001. T.S.

*NC*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

**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 Micro-nutrients and Macro-nutrients.

*Rampur*

**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramannapur  
Dist. Nalgonda - 508 111

*keelaly*

**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508 001, T.S.

*NS*

**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

**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)

*Dr. K. Srinivasa Reddy*  
**DEPARTMENT OF BOTANY**  
Gov. Degree College, Ramannapeta, Asst. Prof. of Botany  
Dist. Nalgonda - 508 118. Govt. Degree College (W)  
NALGONDA-508 001. T.S.

*Dr. N. Chandra Babu*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.



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

**SEC - 3**

**(Credits – 2)**

**Greenhouse Technology**

**(30 hrs)**

**Unit – I**

**(15hrs)**

1. Introduction : Scope – classification of greenhouses – construction of greenhouse- Heating unit-cooling unit – environmental control (light and temperature).
2. Net- poly houses-low-cost green houses .Root media for green houses.
3. Fertilizers : Organic and inorganic, liquid fertilizers ,application of fertilizers.
4. water in the green houses: Irrigation system in green houses-misting, Drip irrigation-micro irrigation, water quality water sanitation.


**Unit—II**


**(15hrs)**

5. Plant protection in green houses :Diseases of green house plants (bacterial ,fungal, nematodes and viral diseases)
6. Management of pest and diseases-integrated pest management.
7. Applications of green house technology :Importance of green house technology. Micropropagation and green house planting of tissue culture transplants.
8. Advantages and disadvantages of green house technology. Seed production, cut flower gardening.

**Suggested readings:**

1. Dubey R.C.2006.A text book of Biotechnology .S.Chand and company. New Delhi.
2. Sheela V.L.2011.Horticulture. MJP Publishers. Chennai.
- 3.Prasad S.,Kumar U.2012.Greenhouse Management for Horticultural crops. Agrobios India.
- 4.Pant V. and NELSON. 1991. Green House Operation and Management. Bali Publication. NewDelhi.
5. Introduction to soil Science:<http://www.agrimoon.com/wpcontent/uploads/Introduction-to-soil-science.pdf>
6. Greenhouse applications :[http://www.lindegas.com/en/products and supply/fumigants/carbon dioxide in agriculture/greenhouse applications/index.html](http://www.lindegas.com/en/products%20and%20supply/fumigants/carbon%20dioxide%20in%20agriculture/greenhouse%20applications/index.html)
7. Role of greenhouse technology in agricultural engineering.

  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramannagar,  
Dist. Nalgonda - 508 112

  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

Greenhouse 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 = 40M

1.

2.

3.


4.


5.


6.

7.

8.

  
DEPARTMENT OF BOTANY  
Govt. Degree College, Ramanaipeta  
Dist. Nalgonda - 508 118

  
Dr. K. Srinivasa Reddy  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

  
Dr. N. CHANDRA BABU, Ph.D.  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

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

**SEC - 4 (2 Hours/Week)**

**(Credits – 2)**

**Mushroom Culture Technology**

**30 hrs**

**Unit – I**

**(15 Hours)**

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**

**(15 Hours)**

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.

*R. Srinivas*  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramannapp  
Dist. Nalgonda - 508 118.

*K. Srinivasa Reddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508 001. T.S.

*NR*  
**Dr. N. CHANDRA BABU,**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

**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.

*R. Srinivas*  
**DEPARTMENT OF BOTANY**  
Gov. Degree College, Ramachandrapuram  
Dist., Nalgonda - 508 113.

*Reddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*NS*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

↙

X

V

**B.SC. BOTANY**  
**III-YEAR: Semester-V**

**Elective -IA: Biodiversity & Conservation**

**DSE-IA(4 Hours/ Week)**

**Credits-4**

**Theory Syllabus**

**(60 Hours)**

**Unit - I**

**(15Hours)**

1. Plant diversity and its scope: Genetic diversity, Species diversity, Plant diversity at the ecosystem level, Agro biodiversity and cultivated plant taxa , wild taxa.
2. Values and uses of Biodiversity: Ethical and aesthetic values, Precautionary principle, Methodologies for valuation, Uses of plants, uses of microbes.

**Unit- II**

**(15 Hours)**

3. Loss of Biodiversity : Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agrobiodiversity, Projected scenario for biodiversity loss.
4. Management of Plant Biodiversity : Organizations associated with biodiversity, management- Methodology for execution- IUCN, UNEP, UNESCO, WWF, NBPGR.
5. Biodiversity legislation and conservation, Biodiversity information management and communication.

*conventions*

**Unit-III**

**(15 Hours)**

6. Conservation of Biodiversity : Conservation of genetic diversity, species diversity and ecosystem diversity.
7. Principles of conservation-In situ and Ex situ conservation. Sacred groove, Botanical garden, Biosphere reserves, Sanctuaries, National parks ( In- situ) and Tissue culture, gene/seed /pollen banks and Cryopreservation (Ex- situ).

**Unit-IV**

**(15 Hours)**

8. Role of plants in relation to Human Welfare ; Importance of forestry their utilization and commercial aspects, Avenue trees, Ornamental plants of India.
9. Alcoholic beverages through ages. Fruits and nuts, Important fruit crops and their commercial importance. Wood and its uses.

**References :**

1. Krishnamurthy, K.V. (2004). An Advanced Text Book of Biodiversity - Principles and practices .Oxford and IBH Publications Co.Pvt.Ltd. New Delhi.
2. Bharucha, E. 2005. Text Book of Environmental Studies for Undergraduate Courses. Universities Press (India) Pvt.Ltd. Hyderabad.
3. Odum, E.P. 1983. Basics of Ecology. Sanders International Students Edition, Philadelphia.
4. Sharma P.D. 1989. Elements of Ecology. Rastogi Publications Meerut.

*Ryagaru*

**DEPARTMENT OF BOTANY**  
**Govt. Degree College, Ramannapeta**  
**Dist. Nalgonda - 508 112**

*healy*

**Dr. K. Srinivasa Reddy**  
**Asst. Prof. of Botany**  
**Govt. Degree College (W)**  
**NALGONDA-508001. T.S.**

*NR*

**Dr. N. CHANDRA BABU, Ph.D.**  
**Asst. Professor of Botany**  
**KRR Govt. Arts & Science College**  
**KODAD-508 206, T.S.**

**B.Sc. BOTANY**  
**III Year , Semester -V**  
**Paper IA: Biodiversity & Conservation**  
**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 at least 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 at least 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)

*Rampus*  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramana  
Dist. Nalgonda - 508 001

*veeddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*kg*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

**B.Sc BOTANY**  
**III Year semester V**  
**Paper IA: Biodiversity & Conservation**

**Practical Syllabus**

*credits : 1*  
*(30 hrs)*

1. Study on local Biodiversity : Herbs, Shrubs and Trees; Seasonal, Annual ,biennial and perennial plants.
2. Study of morphological characteristics of plant communities: Hydrophytes(Eicchornia ,Hydrilla, Pistia, Nymphaea, Vallisneria), Xerophytes; (Asparagus, Opuntia, Euphorbia milli, Casuarina, Calotrophis)
3. Assesment of Biodiversity;
  - i) Avenue trees ; Pongamia pinnata, Butea monosperma, Spathodea sp, Delonix regia, Jacaranda mimosifolia , Cassia fistula, Mimusops elenga, Accacia leucopholoea and Albizia lebbeck.
  - ii) Ornamental plants : Any five locally available ornamental plants.
  - iii) Timber value : Accacia nilotica, Tectona grandis & Azadiracta indica.
  - iv) Fruits : Mangifera indica (mango), Zizipus mauritiana,Psidium guajava, Annona squamosa
  - v) Nuts : Anacardium Occidentale( Cashew), Terminalia catappa( Badam).
  - vi) Beverages; Madhuka indica, Camellia sinensis(Tea), Coffea Arabica(Coffee), Borassus flabellife (Toddy palm) and Caryota urens.
  - vii) Medicinal value; Catharanthus roseus, Tinospora cordifolia and Phyllanthus emblica, Oscimum sps.& Azardirecta indica
4. Field trip; Collection of plants from the field , identification and preparation of Herbarium.

*R. Srinivas Reddy*  
**DEPARTMENT OF BOTANY**  
Gov. Degree College, Ramannampeta  
Dist. Nalgonda - 508 111

*K. Srinivasa Reddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*N. Chandra Babu*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.


**B.Sc Botany III year  
Semester –V  
Elective IA: Biodiversity & Conservation  
Practical model paper**

**Time :2 hrs**

**Max. Marks:50**

- |  |          |
|--|----------|
| 1. Identify and describe Biodiversity value of a) Medicinal b) Timber c) Fruit                       | 3x4=12 M |
| 2. Any two ornamental plants and their uses  | 2x3=6 M  |
| 3. Comment on the specimens A, B & C   | 3x3=9 M  |
| 4. Identify and describe Biodiversity value of the given slides D & E<br>( Hydrophytes & Xerophytes) | 2x4=8M   |
| 5. Herbarium   | 05 M     |
| 6. Record  | 05M      |
| 7. Viva  | 05M      |

  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramannapeta  
Dist. Nalgonda - 508 112

  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.



✓

V

**B.SC. Botany**  
**III-Year, Semester-V**  
**Elective 1B : ECONOMIC BOTANY**

**DSE:1B (4 Hours/Week)**

**Credits:4**

**Theory Syllabus**

**(60 Hours)**

**UNIT:1**

**(15 Hours)**

1. Origin of cultivated plants : Major plants introduction, crop domestication and examples of crops / varieties.
2. Vegetables: Nutritional and commercial values of root crops , Leafy and Fruit vegetables.
3. Millets: Nutrient significance of Sorghum, Finger millet.
4. Cereals : Rice, Wheat and Maize-Origin, morphology and uses.

**UNIT : II**

**(15 Hours)**

- 5 .Legumes: General account, importance to man and ecosystem
- 6 .Fruits and Nuts : Commercial and nutritional value of South Indian Fruits. Cashew nut, Almond and Walnut.
- 7 .Sugars & Starches : Morphology and processing of sugarcane, products and by-products of sugarcane industry. Potato-Morphology, propagation & uses.
- 8 .Spices : Listing of important spices, part used, Economic importance with special reference to gennel, saffron, clove and black pepper.

**UNIT : III**

**(15 Hours)**

9. Beverages: Tea, Coffe(morphology, processing and uses).
10. Edible oils & Fats : General description, Extraction, uses and health implications of groundnut, sunflower, coconut, linseed, and mustard.
11. Essential oils : General account, extraction methods, comparison with fatty oils and their use.
12. Natural Rubber : Para- rubber-tapping, processing and uses.

**UNIT : IV**

**(15 Hours)**

13. Drug yielding plants : Therapeutic and habit-forming drugs with special reference to Cinchona, Digitalis, Papaver and Cannabis.
14. Tobacco processing, uses and health hazards.
15. Timber plants : General account with special reference to teak and pine.
- 16, Fibers : Classification based on the origin of fibers, extraction methods and uses of Cotton and Jute.

**Suggested Readings :**

1. Kochhar, S.L. (2012). Economic Botany in Tropics, MacMillan & Co. New Delhi, India.
2. Wickens, G.E. (2001). Economic Botany: Principles & Practices. Kluwer Academic Publishers, The Netherlands.
3. Chrispeels, M.J. and Sadava, D.E. (2003). Plants, Genes and Agriculture, Jones & Bartlett Publishers.
4. B.P. Pandey (2007). Economic Botany, S. Chand & Company Ltd. New Delhi.

*Dr. K. Srinivasa Reddy*  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramannapeta,  
Dist. Nalgonda - 508 001

*Dr. K. Srinivasa Reddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508 001. T.S.

*Dr. N. Chandra Babu*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College,  
KODAD-508 206, T.S.

**B.Sc. BOTANY**  
**III Year , Semester -V**  
**Paper IB: Economic Botany**  
**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 at least 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 at least 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)

*R. Srinivas*

**DEPARTMENT OF BOTANY**  
Gov. Degree College, Ramannapeta  
Dist. Nalgonda - 508 112

*Reddy*

**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508 001, T.S.

*NS*

**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

DSE-1B

B.Sc Botany  
III-year , Semester-V  
Elective-1B: Economic Botany

Credits-1

Practical Syllabus

30hrs

1. Study of Economically important plants: Wheat, Gram, Soybean, Black pepper, Clove Tea and Cotton through specimens, sections and microchemical tests.
2. Identification and study on nutrient values of locally available vegetables, millets and cereals.
3. Study on nutrient value and commercial status of Cashew nut, Almond and Walnut.
4. Uses and health implications of Groundnut, Sunflower, Coconut, Linseed and Brassica.
5. Identification of Starch granules.
6. Quantitative estimation and comparative study of proteins in millets and cereals.
7. Collection of economically important plants/ Vegetable plants and preparation of Herbarium.

*R. Srinivas*  
DEPARTMENT OF BOTANY  
Gov. Degree College, Ramannabada  
Dist. Nalgonda - 508 001

*K. Srinivasa Reddy*  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*U. G.*  
Dr. N. CHANDRA BABU, Ph.D.  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.


Time: 2 hrs


**B.Sc Botany**  
**III-year , Semester-V**  
**Paper-IB: Economic Botany**

Max Mark:50

**Practical Model Paper**

I. Experiments	
A)Protein Test (Major Experiment)	12M
B)Starch Granules (Minor Experiment)	6M
II. Spotters	4 X 3 12M
C) Leafy/ Fruity Vegetables,	
D) Fruits/Spices,	
E) Medicinal Plants/ Beverages,	
F) Wood/Timber/Fiber	
III. Herbarium	10M
IV. Viva	5M
V. Record	5M

  
**DEPARTMENT OF BOTANY**  
**Gov. Degree College, Ramannapeta**  
**Dist. Nalgonda - 508 117**

  
**Dr. K. Srinivasa Reddy**  
**Asst. Prof. of Botany**  
**Govt. Degree College (W)**  
**NALGONDA-508 001. T.S.**

  
**Dr. N. CHANDRA BABU, Ph.D.**  
**Asst. Professor of Botany**  
**KRR Govt. Arts & Science College**  
**KODAD-508 206, T.S.**

**B.Sc. BOTANY**  
**III -YEAR: SEMESTER -V**  
**Generic Elective (GE)**

**GE-I (4 Hours/Week)**

**(Credits:4)**

**Industrial Microbiology**

**(60 Hours)**

**Unit – I**

**(15 Hours)**

1. Scope of microbes in industry and environment
2. Bioreactors / Fermenters and fermentation Processes
3. Solid- state and liquid – state(stationary and submerged) fermentations; Batch and continuous fermentations.
4. Components of a typical bioreactor, Types of bioreactors-laboratory, pilot scale and production fermenters.

**Unit – II**

**(15 Hours)**

5. Constantly stirred tank fermenter, tower fermenter, fixed bed and fluidized bed bioreactors and air-lift fermenter. A visit to any educational institute/industry to see an industrial fermenter, and other downstream processing operations.
6. Microbial production of industrial products: Micro organisms involved, media, fermentation conditions, downstream processing and uses.
7. Filtration, centrifugation, cell disruption, solvent extraction, precipitation and ultrafiltration, lyophilization, spray drying.
8. Hands on microbial fermentations for the production and estimation (qualitative and quantitative) of Enzyme: amylase or lipase activity, organic acid (citric acid or glutamic acid), alcohol (Ethanol) and antibiotic (Penicillin).

**Unit –III**

**(15Hours)**

9. Microbial enzymes of industrial interest and enzyme immobilization.
10. Microorganisms for industrial applications and hands on screening microorganisms for casein hydrolysis; starch hydrolysis; cellulose hydrolysis.
11. Methods of immobilization, advantages and applications of immobilization, large scale applications of immobilized enzymes (Glucose isomerase and penicillin acetylase).
12. Microbes and quality of environment. Distribution of microbes in air, Isolation of microorganisms from soil, air and water.

**Unit – IV**

**(15Hours)**

13. Microbial flora of water. Water pollution, role of microbes in sewage and domestic waste water treatment systems.
14. Determination of BOD, COD, TDS and TOC of water samples; Microorganisms indicators of water quality, check coliform and fecal coliform in water samples.
15. Microbes in agriculture and remediation of contaminated soils.
16. Biological fixation; micorrhizae; Bioremediation of contaminated soils. Isolation of root nodulating bacteria, arbuscular micorrhizal colonization in plant roots.

\*\*\*

**Suggested Readings:**

1. Pelzar, M.J. Jr., Chen E.C.S., Krieg, N.R. (2010). Microbiology: An application based approach. Tata McGraw Hill Education Pvt. Ltd., Delhi.
2. Tortora, G.J., Funke, B.R., Case, C.L. (2007). Microbiology. Pearson Benjamin Cummings, San Francisco, U.S.A. 9<sup>th</sup> edition.

**DEPARTMENT OF BOTANY**  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College, Ramannage,  
Nalgonda - 508 118  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KORAD-502 206 T.S.

Industrial Microbiology (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.

7.

*R. Srinivas*  
DEPARTMENT OF BOTANY  
Govt. Degree College, Ramanna  
Dist. Nalgonda - 508 112

*K. Srinivasa Reddy*  
Dr. K. Srinivasa Reddy  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*NR*  
Dr. N. CHANDRA BABU, Ph.D.  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

NG

V

**B.SC. BOTANY**  
**III YEAR: Semester-VI**  
**Elective-2A: Tissue Culture and Biotechnology**

**DSE -2A(4 Hours/ Week)**

**(Credits – 4)**

**(60 Hours)**

**UNIT-1:**

**(15 Hours)**

1. Tissue culture: Introduction, Sterilization procedures, explants, culture media-composition and preparation, Nutrient and hormone requirements, Micro propagation.
2. Organ culture : Totipotency , vegetative organs – Root, shoot, leaf culture  
Reproductive organs - Anther, Ovule, Embryo culture.
3. Callus culture and isolation and fission of protoplast culture.
4. Organogenesis, embryogenesis (somatic and zygotic).

**UNIT-11**

**(15 Hours)**

5. Applications of Tissue Culture: Production of Pathogen free plants and stress resistant plants, somaclonal variants and synthetic seeds.
6. Induction of hairy roots and its applications in production of secondary metabolites.
7. Haploidy and Triploids, Cryopreservation and Germplasm conservation.
8. Somatic Hybrids and Cybrids.

**UNIT-III**

**(15 Hours)**

9. Biotechnology: Introduction, History, Scope and applications.
10. rDNA technology: Basic aspect of gene cloning, Enzymes used in gene cloning-Restriction enzymes, Ligases, Polymerases.
11. Gene cloning: Recombinant DNA, Bacterial transformation and selection of recombinant clones, vectors-cloning vehicles (Plasmid, cosmids, Bacteriophages & Phagemids; Eukaryotic vectors (YAC) gene construct, applications of rDNA technology.

**UNIT-IV**

**(15 Hours)**

12. Gene Libraries: Construction of genomic and <sup>DNA</sup>C-DNA libraries, colony hybridization; probes oligonucleotides, polymerase chain reaction (PCR) and its applications.
13. Methods of gene transfer- Agro bacterium –mediated , Direct gene transfer by Electro poration , Microinjection, Micro projectile bombardment; selection of transgenic-selectable marker and reporter genes.
14. Application of transgenic in improvement of crop productivity and quality traits. Pest resistant transgenic crops (Bt-Cotton & Bt-Brinjal); Herbicide resistant plants(Roundup Ready Soybean); crops with quality traits( Flavor Savor Tomato, Golden rice).

**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramannapeta  
Dist., Nalgonda - 508 113

**Dr. K. Srinivasa Reddy**  
\*\*\*\*\* Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508 001. T.S.

**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

## References:

1. Balasubramanyan, 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. Chawla, 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. 4<sup>th</sup> edn. (India edition), wordsworth, Thomson learning Inc., USA.
10. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture ; Theory and practice. Elsevier science Amsterdam. The Netherland.
11. Glick, B.R., Pasternac, J.J. (2003). Molecular Biotechnology – Principles and applications of Recombinant DNA. ASM Press, Washington.
12. Bhojwani, S.S. Bhatnagar, S.P. (2011). The Embryology of Angiosperms. Vikas publication House Pvt. Ltd., New Delhi. 5<sup>th</sup> Edition.
13. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics. John Wiley and sons, UK. 5<sup>th</sup> Edition.
14. Stewart, C.N. Jr. (2008). Plant Biotechnology And Genetics.. Principles, techniques and applications. John Wiley and sons Inc. U.S.A

*R. Srinivas Reddy*  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramannaga.  
Dist. Nalgonda - 508 001

*K. Srinivas Reddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*N. Chandra Babu*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.



**B.SC (CBCS) BOTANY- III YEAR**  
**Semester-VI**  
**Elective II A: 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 at least 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 at least TWO question from EACH UNIT of the given syllabus.)

Write detailed answers for ALL of the following:

**4 X 10 = 40 M**

- |         |            |
|---------|------------|
| 12 . a) | Unit - I   |
|         | OR         |
| b)      | Unit - II  |
| 13 . a) | OR         |
| b)      | Unit - III |
| 14 . a) | OR         |
| b)      | Unit -IV   |
| 15 . a) | OR         |
| b)      |            |

  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramannapeta  
Dist. Nalgonda - 508 001

  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508 001. T.S.

  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

**B.Sc., BOTANY – III Year**  
**Semester - VI**  
**Tissue Culture & Biotechnology**  
**Practical Syllabus**

*Credits-1*  
**30 Hours**

**Elective IIA**

**Major Experiments:**

**20 Hours**

1. Isolation of plant DNA (Tomato).
2. Production of Synthetic Seeds/Encapsulation of embryo
3. Preparation of Plant tissue culture medium – MS Medium.
4. Isolation of protoplasts.

**Minor Experiments:**

**10 Hours**

1. Callus induction.
2. Demonstration of Micro propagation/Multiple shoots.
3. Anther culture.
4. PCR – Demonstration.
5. Study of biotechnology products: Samples of antibiotics and vaccines.
6. Photographs of Gene transfer methods.
7. Instruments used in Biotechnology lab-Autoclave, Laminar air flow, Hot air oven and Incubator.
8. Demonstration of In-vitro sterilization and inoculation methods using leaf and nodal explants of tobacco, Datura, Brassica etc.,

**Spotting:**

1. Study of anther, embryo and endosperm culture, micropropagation, somatic embryogenesis & artificial seeds through photographs.
2. Study of methods of gene transfer through photographs, Agrobacterium- mediated, direct gene transfer by electroporation, microinjection, microprojectile bombardment.
3. Study of steps of genetic engineering for production of Bt cotton, golden rice, Flavr Savr tomato through photographs.
4. Restriction digestion and gel electrophoresis of plasmid DNA.

\* \* \*

*Ramanna*  
**DEPARTMENT OF BOTANY**  
Gov. Degree College, Ramanna,  
Dist. Nalgonda - 508 118.

*Reddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*Ch*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

**B.Sc (CBCS) Botany – III Year**  
**Semester – VI**  
**II A : Tissue Culture and Biotechnology**  
**Practical Model Paper**

**Time:2 Hrs**

**Max. Marks:50**

- 1. Major Experiment** ( 18 Marks)  
Isolation of DNA  
(OR)  
Production of synthetic seeds / Encapsulation of embryo
  
- 2. Minor Experiment** (10 Marks)  
Callus / Micro propagation / Multiple shoots.
  
- 3. Spotters** (3 x 4 = 12 Marks)  
A. Vaccines  
B. Antibiotics  
C. Gene transfer methods / instruments.
  
- 4. Record** (5 Marks)
- 5. Viva** (5 Marks)

\* \* \*

*Reddy*

**DEPARTMENT OF BOTANY**  
Gov. Degree College, Ramanna  
Dist. Nalgonda - 508 001

**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*Chandra Babu*

**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

### Suggested readings

1. Karp, G 2010. Cell and Molecular Biology: Concepts and Experiments. 6<sup>th</sup> Edition. John Wiley & Sons. Inc.
2. De Robertis, E.D.P. and De Robertis, E.M.F. 2006. Cell and Molecular Biology, 8<sup>th</sup> edition. Lippincott Williams and Wilkins, Philadelphia.
3. Cooper, G.M. and Hausman, R.E. 2009. The Cell: A Molecular Approach, 5<sup>th</sup> edition. ASM Press & Sunderland, Washington, D.C; Sinauer Associates, MA.
4. Becker, W.M., Kleinsmith, L.J., Hardin J. and Bertoni, G.P. 2009. The World of the Cell. 7<sup>th</sup> edition. Pearson Benjamin Cummings Publishing, San Francisco.

*Reddy*  
Dr. K. Srinivasa Reddy  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001, T.S.

*R. Srinivas* \*\*\*\*\*  
DEPARTMENT OF BOTANY  
Govt. Degree College, Ramana  
Dist. Nalgonda - 508 111

*we*  
Dr. N. CHANDRA BABU, Ph.D.  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

B.SC (CBCS) BOTANY- III YEAR

Semester-VI

Paper-2B: Analytical Techniques in Plant Sciences

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 at least 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 at least 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)

DEPARTMENT OF BOTANY

Govt. Degree College, Ramannapeta -  
Dist. Nalgonda - 508 113

Dr. K. Srinivasa Reddy  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

Dr. N. CHANDRA BABU, Ph.D.  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

**B.SC (CBCS) BOTANY- III YEAR**  
**Semester-VI**  
**Paper-2B: Analytical Techniques in Plant Sciences**

**DSE: 2B**

**Credits: 1**

**Practical Syllabus**

**Lectures: 30**

1. Study of Blotting techniques: Southern, Northern and Western, DNA fingerprinting, DNA sequencing, PCR through photographs.
2. Demonstration of ELISA.
3. To separate nitrogenous bases by paper chromatography.
4. To separate sugars by thin layer chromatography.
5. Isolation of chloroplast by differential centrifugation.
6. To separate chloroplast pigments by column chromatography.
7. To estimate protein concentration through Lowry's methods.
8. To separate proteins using PAGE.
9. To separate DNA (markers) using PAGE.
10. Study of different microscopic techniques using photographs/micrographs (Freeze fracture, Freeze Etching, negative staining, positive staining, fluorescence and FISH).
11. Preparation of permanent slides (double staining).

*R. Srinivas*  
**DEPARTMENT OF BOTANY**  
**Govt. Degree College, Ramannabada**  
**Dist. Nalgonda - 508 112**

*Reddy*  
**Dr. K. Srinivasa Reddy**  
**Asst. Prof. of Botany**  
**Govt. Degree College (W)**  
**NALGONDA-508001, T.S.**

*Ch*  
**Dr. N. CHANDRA BABU, Ph.D.**  
**Asst. Professor of Botany**  
**KRR Govt. Arts & Science College**  
**KODAD-508 206, T.S.**

**B.SC (CBCS) BOTANY- III YEAR**  
**Semester-VI**  
**Elective II B: Analytical Techniques in Plant Sciences**

**Time: 2hrs**

**Practical Model Paper**

**Max Marks: 50**

**Practical Syllabus**

**I. Experiments**

- |    |                  |     |
|----|------------------|-----|
| A. | Major Experiment | 12M |
| B. | Minor Experiment | 8M  |

**II. Permanent Slide Preparation** 8M

**III. Spotters** 4 X 3 12M

C)

D)


E)

F)

**IV. Viva** 5M

**V. Record** 5M

  
**DEPARTMENT OF BOTANY**  
Gov. Degree College, Ramannapa  
Dist. Nalgonda-508 111

  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

## B.Sc -Botany

III-Year : Semester -VI

### Cell & Molecular Biology

**Advanced course**

**Credits-4**

#### Theory syllabus

**(60 Hours)**

#### Unit - I

**(15Hours)**

1. The cell theory, Prokaryotic and Eukaryotic cells, cell size and shape; Eukaryotic cell components.
2. Cell organelles-mitochondria, chloroplast structure & composition semiautonomous nature, Mt DNA, Chloroplast DNA.
3. Endoplasmic reticulum, Golgi body and Lysosomes structures and roles.
4. Nucleic acids: salient features of DNA, structure and Types of RNA.

#### Unit - II

**(15Hours)**

5. DNA: Miescher to Watson and Crick-Historic Perspective, Griffith's and Avery's transformation experiments, Hershey-Chase Bacteriophage experiment, DNA structure and Types, organization of DNA in prokaryotes.
6. DNA replication-Semi conservative, semi discontinuous: Replication of linear ds-DNA.
7. Central dogma and genetic code: Central dogma (Adapter Hypothesis and discovery of mRNA template), salient features of Genetic code.

#### Unit - III

**(15Hours)**

8. Mechanism of Transcription: Transcription in Prokaryotes and Eukaryotes; Split genes-Concept of introns and exons, removal of introns, Eukaryotic mRNA processing (5' cap, 3' polyA tail).
9. RNA editing and mRNA transport.

#### Unit - IV

**(15Hours)**

10. Translation in prokaryotes: Ribosome structure and assembly, mRNA; Charging of tRNA, aminoacyl tRNA synthetase; Various steps in protein synthesis, protein involved in initiation, elongation and termination of polypeptides; Fidelity of Translation.
11. Transcriptional regulation in prokaryotes, Regulation of Lactose metabolism (Lac operon) and tryptophan (Trp operon) synthesis in E.coli.

*R. Srinivas*  
DEPARTMENT OF BOTANY  
Govt. Degree College, Ramannagara,  
Dik. Nalgonda - 508 119

*Reddy*  
Dr. K. Srinivasa Reddy  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*KCB*  
Dr. N. CHANDRA BABU, Ph.D.  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.



**B.SC (CBCS) BOTANY- III YEAR**  
**Semester-VI**  
**Advanced course : Cell & Molecular Biology**

**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 at least 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)

*R. Srinivas*

**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramachandrapur,  
Dist. Nalgonda - 508 118.

*beelaly*

**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508 001. T.S.

*he*

**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.

**B.Sc. Botany**  
**III Year: Semester – VI**  
**Project / Dissertation Work**

**Credits:-4**

Project work/Dissertation is considered as a special course involving application of knowledge in solving / analyzing / exploring a real life situation / difficult problem. The Project / Dissertation work will be of 4 credits. Studies subject specific project work can be handled, with a view to develop creative thinking, team spirit and skill. The project work at preliminary level should be assigned to students, in group.

Project report in the form of dissertation is prepared and submitted by the students. It will be evaluated by the External and Internal Examiners. Head of the Department will chair the evaluation panel and proceedings of viva voice. It carries a maximum of 100 marks.

**Project guidelines:**

1. Understand the subject broadly.
2. Choose a topic of interest.
3. Refer to the books & interact with subject specific experts.
4. Try to understand the basic principles of Living organisms followed by Plants, with the help of Physics, Chemistry and Statistics.
5. Select the topic applicable locally to know the importance of the subject in daily life. Preferably choose, vegetation around the institution, around home, agricultural crops, vegetable markets and nearby relevant industries.
6. Put together, latest technology and methods, basic knowledge on selected theme, importance / need, locally applicable.
7. Summarize three years knowledge on the subject, go through Skill enhancement course, correlate to real life and choose the project work.
8. Laboratory facilities, books to refer and faculty with research experience are essential to handle Project.
9. Analyze your Data and Draw a Conclusion.
10. Communicate the Results.
11. Work division among the group members should be followed.
12. Maximum number of students in a group should not exceed 5.

**Project Examination**

**Max. Marks:100**

- |                         |      |
|-------------------------|------|
| 1. Project Report       | 75 M |
| 2. Seminar Presentation | 25 M |

*RpaupwS*  
**DEPARTMENT OF BOTANY**  
Govt. Degree College, Ramannapeta,  
Dist. Nalgonda - 508 112.

*keeddy*  
**Dr. K. Srinivasa Reddy**  
Asst. Prof. of Botany  
Govt. Degree College (W)  
NALGONDA-508001. T.S.

*kg*  
**Dr. N. CHANDRA BABU, Ph.D.**  
Asst. Professor of Botany  
KRR Govt. Arts & Science College  
KODAD-508 206, T.S.