PROCEEDINGS OF NAGARJUNA GOVT. COLLEGE, NALGONDA
AUTONOMOUS
Present: Dr.R.Nagender Reddy, M.A.LLB.Ph-D

Rc.No.Spl/BOS/2014. **Date:12.05.2014.**

Sub:- Approval of BOS for the Academic year 2014 – 2015 Order issued - Req – Reg.

As per the instructions of the Commissioner of Collegiate Education to ensure the employability to the Under Graduate Students, the College is introducing Choice Based Credit System (CBCS) this academic year 2014 – 2015 by offering inter-disciplinary courses, which is mandatory to all the students to be pursued in any one of the semesters through the three years Degree course.

2. The Examinations are conducted on Semester Basis.
3. Each semester is of 100 marks in which 70 marks for Theory and 30 marks for Internal Examinations (20 marks for written examination, 5 marks for Assignment and 5 marks for Seminar).

Principal
PRINCIPAL
Nagarjuna Govt. College
(Autonomous) NALGONDA.

Commissionerate of Collegiate Education, A.P., Hyderabad

Tentative schedule for completion of the process for introduction of CBCS in Govt., Autonomous Colleges from the academic year 2014-15

S.No	Activity	Time line
1	Preparation of draft Blue prints for Modular & CBS system for 11 subjects	16.4.2014
2	Preparation of draft Blue prints CGPA evaluation system for BA. B.Sc and B.Com programmes	17.4.2014
3	Vetting of draft Blue prints in 11 subjects by the respective department in colleges. Preparation of Blue prints for all other subjects in respective colleges	26.4.2014
4	All preliminary permissions from the CCE office to the principals	02.5.2014
5	Completion of verification of final Blue prints by O/o CCE officers by visiting the colleges	10.5.2014
6	Approval of Modular, CBCS and CGPA by respective BoS	15.5.2014
7	Approval of CBCS by Academic Councils of the respective colleges	20.5.2014
8	Approval of CBCS by respective GBs	25.5.2014
9	Commencement of CBCS in 10 Govt., autonomous colleges	01.6.2014

Principal
Nagarjuna Govt. College
(Autonomous) NALGONDA.

From
Prof K. Sathya Prasad
Subject Botany
Osmania University,
HYDERABAD.

To,
The Principal,
Nagarjuna government College,
NALGONDA.

Sir,

In response to your letter dated 14-05-2014, I am acknowledging my Consent to act as hon'ble member/ Subject expert of BOS in your Dept of Botany. Nagarjuna Govternment College, Nalgonda.

Thanking you,

Yours Sincerely

Prof: K. SATYA PRASAD
DEPT. OF BOTANY
Osmania University, Hyderabad.

From
Prof S. Seeta Ram Rao
Subject Botany
Osmania University,
HYDERABAD.

To,
The Principal,
Nagarjuna government College,
NALGONDA.

Sir,

In response to your letter dated 14-05-2014, I am acknowledging my Consent to act as hon'ble member/ Subject expert of BOS in your Dept of Botany Nagarjuna Govternment College, Nalgonda.

Thanking you,

Yours Sincerely

S. Seeta Ram

Prof. S. SEETA RAM RAO
Department of Botany
Osmania University
HYDERABAD - 500 007.

From
Prof Dr. B. Sadasivaiah
Subject BOTANY
Osmania University
HYDERABAD.

To,

The Principal,
N.G College,
NALGONDA.

Sir,

In response to your letter dated 14-05-2014., I am acknowledging my Consent to act as hon'ble member/ Subject expert of BOS in your Dept of BOTANY. Nagarjuna Govt College, Nalgonda.

Thanking you,

B. Sadasivaiah

Yours Sincerely

NAGARJUNA GOVERNMENT COLLEGE (A), NALGONDA

DEPARTMENT OF BOTANY

BOARD OF STUDIES MEETING

The meeting of Board of studies, Department of Botany, Nagarjuna Government College, Nalgonda was held on 17-05-2014. The following resolutions are made in the meeting.

1. Approval to introduce the Choice Based Credit System (CBCS), as per the instructions of the Commissioner of Collegiate Education, from this academic year 2014-15 by offering interdisciplinary courses.
2. Approval of syllabus for I, II, III, IV, V, VI Semesters of B. Sc I, II, III Year Botany (Theory and Practical) for the academic year 2014-15.
3. Approval of examination pattern as each semester is of 100 marks in which 70 marks for theory and 30 marks for Internal Examinations (20 marks for written examination, 5 marks for assignment and 5 marks for seminar).
4. Approval of model question papers for theory and practical.
5. It is resolved that the following members are appointed as panel of examiners.
   - i) P. Suresh Babu (Lect in Boatny, GDC, Ibrahimpatnam)
   - ii) Dr. O. Padmaja (Lect in Boatny, GDC (W), Nalgonda)
   - iii) Dr. K. Srinivas Reddy (Lect in Boatny, KRR GDC, Kodad)
   - iv) Dr. S. Anuradha (Lect in Boatny, GDC, Kamareddy, NZMBD)
   - v) P. V. Lakshmi Narayana (Lect in Boatny, KRR GDC, Kodad)
   - vi) Dr. M. Satyanaryana Reddy (Lect in Boatny, SP College, Secunderabad)
   - vii) Dr. Rajender Singh (Principal, GDC, Palem)
   - viii) P. Indra Reddy (Principal, Siddartha Degree College, Nalgonda)

Chairman, Board of Studies: N. Siddulu
In- Charge, Dept of Boatny,
Nagarjuna Government College.

University Nominee: Prof: S. Seeta Ram Rao
Dept of Botany, O.U.

Prof. S. SEETA RAM RAO
Department of Botany
Osmania University
HYDERABAD - 500 007.

Prof. K. SATYA PRASAD
DEPT. OF BOTANY
Osmania University, Hyderabad.

Subject Experts: Prof: K. Satya Prasad
Dept of Boatny, O. U.

Dr. B. Sadasivaiah
Lecturer in Boatny,
GDC, Wanaparthy

Members: M.V.V. Satyaveni, Lecturer in Botany
A. Ramana Rao, Lecturer in Botany
G. Saritha, Lecturer in Botany (Cont)
A. RAju, Lecturer in Botany (Cont)
G. Naveen, Lecturer in Botany (Cont)
B. Jana Reddy, Lecturer in Botany (Guest)
B. Ramesh, Lecturer in Botany (Guest)

NAGARJUNA GOVERNMENT COLLEGE (A), NALGONDA

RE-ACCREDITED BY NAAC WITH "A" GRADE

Allocation of credits at subject level

Course: **B.Sc.** Subject: **BOTANY**

S.No.	Semester	Module(Paper)	Hours/ Week	Max. Marks	Credits
1.	I(Core)	Microbes, Algae and Fungi	04	100	03
2.	II (Core)	Bryophytes, Pteridophytes & Gymnosperms	04	100	03
3.	Practicals	Cryptogams & Gymnosperms	03	50	02
4.	III (Core)	Anatomy & Embryology	04	100	03
5.	IV (Core)	Taxonomy & Medicinal Botany	04	100	03
6.	Practicals	Anatomy, Embryology, Taxonomy & Medicinal Botany	03	50	02
7.	V (Core)	Cell Biology ,Genetics, Ecology & Biodiversity	04	100	03
8.	Elective I (Advanced)	Molecular Plant Pathology	03	100	02
9.	Elective II (Advanced)	Basic Biochemistry	03	100	02
10.	Practicals	Cell Biology ,Genetics, Ecology & Biodiversity	03	50	02
11.	VI (Core)	Plant Physiology, Biotechnology Seed Technology & Horticulture	04	100	03
12.	Elective I (Applied)	Bio fertilizers	03	100	02
13.	Elective II (Applied)	Forestry	03	100	02
14.	Practicals	Plant Physiology, Biotechnology Seed Technology & Horticulture	03	50	02
15.	TOTAL CREDITS				30
16.	Project Work				
17.	Others				

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Department of Botany
N.G College, Nalgonda

NAGARJUNA GOVERNMENT COLLEGE, NALGONDA

(AUTONOMOUS, RE-ACCREDITED BY NAAC WITH "A" GRADE)

B.Sc I Year I SEMESTER SYLLABUS (2014-15)

Subject: **Botany**
Name of the Module: **Microbial Diversity, Algae and Fungi**
Nature of the Module: **Core**
Mode of the Learning: **Regular**

UNIT- I

Evolution of Life and Diversity of Microbes:

1. Origin and evolution of Life - an outline.

2. Viruses: Structure, replication and transmission; plant diseases caused by viruses and their control.

3. Bacteria: Structure, nutrition, reproduction and economic importance.
An outline of Plant diseases of important crop plants caused by bacteria and their control.

4. Brief account of Archaebacteria, Chlamydia, Actinomycetes and Mycoplasma.

UNIT- II

Algae:

5. Algae: General account, thallus organisation, structure, reproduction, classification and economic importance.

6. Structure, reproduction, life history and systematic position of *Oedogonium, Coleochaete, Char.*

UNIT-III

7. Structure, reproduction, life history and systematic position of *Ectocarpus* and *Polysiphonia.*

8. Cyanobacteria: Cell structure, thallus organisation and their prospecting (uses)–Biofertilizers. Structure and life history of *Oscillatoria, Nostoc* and *Anabaena.*

UNIT-IV

Fungi:

9. Fungi: General characters, classification and economic importance.

10. Structure, reproduction and life history of *Albugo, Saccharomyces, Penicillium, Puccinia, Alternaria,*. General account of plant diseases caused by Fungi and their control.

11. Lichens: Structure and reproduction; ecological and economic importance.

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NAGARJUNA GOVERNMENT COLLEGE (AUTONOMOUS) NALGONDA.

MODEL QUESTION PAPER

B. Sc I Yr, I Semester-End examination

BOTANY (Paper-I)

(Module: Diversity of Microbes, Algae & Fungi)

Time: 2 ½ Hrs. **Max Marks: 70**

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

SECTION-A

(5 X 2 = 10)

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 from **EACH UNIT** of the given syllabus).*

Write short answers for **FOUR** of the following: **(4 X 5 = 20)**

6.

7.

8.

9.

10.

11.

SECTION-C

***(Instructions to the question PAPER SETTER:** Set **TWO** questions from **EACH UNIT** of the given syllabus).*

Write detailed answers for **ALL** of the following: **(4 X10 = 40)**

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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NAGARJUNA GOVERNMENT COLLEGE, NALGONDA

(AUTONOMOUS, RE-ACCREDITED BY NAAC WITH "A" GRADE)

B.Sc I Year II SEMESTER SYLLABUS (2014-15)

Subject: **Botany**
Name of the Module: **Bryophyta, Pteridophyta, Gymnosperms & Palaeobotany**
Nature of the Module: **Core**
Mode of the Learning: **Regular**

UNIT-I

Bryophyta:
1. Bryophytes: General characters, classification and alternation of generations.
2. Structure, reproduction, life history and systematic position of *Marchantia, Anthoceros* and *Polytrichum.*
3. Evolution of Sporophyte in Bryophytes.

UNIT-II

Pteridophytes:
4. Pteridophytes: General characters, classification, alternation of generations and evolution of sporophtyte.
5. Structure, reproduction, life history and systematic position of *Rhynia, Lycopodium, Equisetum* and *Marsilea.*
6. Evolution of stele, heterospory and seed habit in Pteridophytes.

UNIT-III

Gymnosperms and Palaeobotany:
7. Gymnosperms: General characters, structure, reproduction and classification.
8. Morphology of vegetative and reproductive parts, systemic position, life history of *Pinus* and *Gnetum.*

UNIT-IV

9. Distribution and economic importance; endangered Gymnosperms.
10. Palaeobotany: Introduction, Fossils and fossilization; Geological time scale; Importance of fossils.
11. Bennettitales: General account.

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NAGARJUNA GOVERNMENT COLLEGE (AUTONOMOUS) NALGONDA.

MODEL QUESTION PAPER

B. Sc **I** Yr, **II** Semester-End examination

BOTANY (Paper-II)

(Module: Bryophyta, Pteridophyta, Gymnosperms & Palaeobotany)

Time: 2 ½ Hrs. **Max Marks: 70**

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

SECTION-A

(5 X 2 = 10)

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 from **EACH UNIT** of the given syllabus).*

Write short answers for **FOUR** of the following **(4 X 5 = 20)**

6.

7.

8.

9.

10.

11.

SECTION-C

***(Instructions to the question PAPER SETTER:** Set **TWO** questions from **EACH UNIT** of the given syllabus).*

Write detailed answers for **ALL** of the following: **(4 X10 = 40)**

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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NAGARJUNA GOVERNMENT COLLEGE, NALGONDA

(AUTONOMOUS, RE-ACCREDITED BY NAAC WITH "A" GRADE)

BOTANY

B.Sc I Year **Practical Syllabus**
Academic Year 2014-15
Paper – I
(Microbial Diversity, Cryptogams and Gymnosperms)
(Total Hours of Laboratory Exercises: 90 @ 3 h / Week in 30 Sessions)

Suggested Laboratory Exercises:

1 Knowledge of equipment used in Microbiology: Spirit lamp, Inoculation loop, Hot air oven, Autoclave / Pressure cooker, Laminar air flow / Inoculation chamber, Incubator, etc. (3 h)

2 Preparation of solid and liquid media for culturing of microbes (Demonstration) (9 h)

3 Study of viruses and bacteria using electron micrographs (photographs). (3 h)

4 Gram staining of Bacteria (3 h)

5 Study of symptoms of plant diseases caused by viruses and bacteria:

Viruses: Tobacco mosoic virus, Bunchy top of banana, Yellow vein clearing of bhendi, Leaf curl of papaya (3 h)

Bacteria: Citrus canker, Leaf blight of Rice, Angular leaf spot of cotton. (3 h)

6. Vegetative and reproductive structures of the following taxa:

Algae: *Oscillatoria*, *Nostoc, Anabena, Volvox*, *Oedogonium*, *Coleochaete*, *Ectocarpus* and *Polysiphonia.* (6 h)

Fungi: *Albugo*, *Saccharomyces Penicillium*, *Puccinia* and *Alternaria*. (6 h)

7. Section cutting of diseased material infected by Fungi and identification of pathogens as per theory syllabus. (6 h)

8. ***Lichens***: Different types of thalli and their external morphology (3 h)

9. Morphology (vegetative and reproductive structures) and anatomy of the following taxa:

Bryophytes: *Marchantia*, *Anthoceros* and *Polytrichum*. (9 h)

Pteridophytes: *Lycopodium*, *Equisetum* and *Marsilea*. (12 h)

Gymnosperms: *Pinus* and *Gnetum*. (6 h)

10. Fossil forms using permanent slides / photographs: *Rhynia* and *Cycadeoidea* (3 h)

11. Symptoms of plant diseases caused by Fungi and mycoplasma: Tikka disease of Groundnut, Late blight of Potato, Ergot of Bajra, Whip smut of Sugarcane, Wheat rust, Brown spot of Rice, Rice (Paddy) blast, Head smut of Sorghum, Little leaf disease of Brinjal (3 h)

12. Enumeration and examination of important microbial, fungal and algal products: Biofertilizers, protein capsules, antibiotics, mushrooms, SCP, Agar-agar etc. (6 h)

13. Field visits to places of algal / microbial / fungal interest (e.g. Mushroom cultivation, water bodies) (6 h)

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NAGARJUNA GOVERNMENT COLLEGE, NALGONDA

(AUTONOMOUS, RE-ACCREDITED BY NAAC WITH "A" GRADE)

Model Question Paper for B.Sc I Year Practical Examination

SUBJECT: - BOTANY

(Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms)

Time: 3 Hrs, **Max.Marks:50**

Q1. Identify the algae (ABCD) from the given mixture and draw labeled diagrams by giving important characters. 4 x 3 =12

Q2. Describe the procedure of bacterial staining and identify the given Bacterium. Gram +Ve, Gram –Ve (E) 1 x 4 = 04

Q3. Prepare temporary mount of the given diseased plant material. Identify and give the description of pathogen with the help of diagrams. (F)

1 x 7 = 07

Q4. Prepare the section of the given material (Bryophyta, Pteridodophyta and Gymnosperms) by using single staining method, identification and description of the slide. (G) 1 x 10 =10

Q5. Identification and description of specimens and slides. (H, I, J, K) 4 x 3 = 12

Q6. Record 1 x 5 = 05

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NAGARJUNA GOVERNMENT COLLEGE, NALGONDA

(AUTONOMOUS, RE-ACCREDITED BY NAAC WITH "A" GRADE)

BOTANY

B.Sc II Year III SEMESTER SYLLABUS (2014-15)

(Plant Anatomy and Embryology)

UNIT – I

Plant Anatomy:

1. Introduction to Plant Anatomy
   Meristems: Types, histological organisation of shoot and root apices and theories.

2. ***Tissues*** and ***Tissue Systems:***
   (a) Simple tissues (b) Complex tissues (c) Special tissues (d) Ground tissue system
   (e) Vascular tissue system and epidermal tissue system.

3. ***Leaf:*** Ontogeny, diversity of internal structure; stomata and epidermal outgrowths.

UNIT – II

4. Internal structure of stem and root, formation and functions of vascular cambium. Normal secondary growth of dicot stem.

5. Anomalous secondary growth of the following stems and root.
   (a) Achyranthes (b) Boerhavia (c) Dracaena (d) Bignonia (e) Beta root.

6. Wood Anatomy:- General account study of local timbers
   (a) Teak (*Tectona grandis*)
   (b) Rose wood (*Dalbergia latifolia*)
   (c) Red sanders (*Pterocarpus santalinus*)
   (d) Nallamaddi (*Terminalia tomentosa*)
   (e) Yegisa (*Pterocarpus marsupium*)
   (f) Neem (*Azadirachta indica*)

UNIT – III

Embryology:

7. (a) Introduction: History and importance of Embryology.
   (b) Anther structure, Microsporogenesis and development of male gametophyte.
8. (c) Ovule structure and types; Megasporogenesis; types and development of female gametophyte.

UNIT- IV

9. Pollination - Types; Pollen - pistil interaction. Fertilization.
10. Endosperm - Development and types. Embryo - development and types; Polyembryony and Apomixis - an outline.
11. Palynology:- Pollen morphology (a) Hibiscus (b) Acacia (c) Grass, NPC System.

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FACULTY OF SCIENCE

MODEL QUESTION PAPER

B. Sc II Yr, III Semester-End examination

BOTANY (Paper-III)

(Plant Anatomy and Embryology)

Time: 2 ½ Hrs. **Max Marks: 40**

Section – A

(Marks 4 x 8 =32)

Answer all the questions, answer should not exceed 80 lines for each question. Draw well labeled diagrams; wherever necessary.

1. (a) Write an essay on meristem.
   (or)
   (b) Write an general account of internal structure of dorsiventral and isobilateral leaves.
2. (a) Describe the anomalous secondary growth of Dracaena stem.
   (or)
   (b) Describe the wood anatomy of Rose wood and Neem.
3. (a) Describe the development of male gametophyte in angiosperms.
   (or)
   (b) Give an account of megasporogenesis in angiosperms.
4. (a) Describe the process of double fertilization in angiosperms.
   (or)
   (b) Give an account of polyembryony.

Section-B

(Marks 4x2 = 8)

Attempt any four questions; answer should not exceed 20 lines.

1. Tunica – Corpus theory
2. Types of stomata
3. Teak wood
4. Functions of vascular cambium
5. Female gametophyte
6. Orthotropous ovule
7. Apomixis
8. Hibiscus pollengrain

NAGARJUNA GOVERNMENT COLLEGE, NALGONDA

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BOTANY

B.Sc **II** Year **IV** SEMESTER SYLLABUS (2014-15)

(Taxonomy and Medicinal Botany)

UNIT – I

Taxonomy:

1. Introduction: Principles of plant systematics, Systematics vs Taxonomy, Types of classification: Artificial, Natural and Phylogenetic.

2. Systems of classification: Salient features and comparative account of Bentham & Hooker and Engler & Prantle. An introduction to Angiosperm Phylogeny Group (APG).

3. Current concepts in Angiosperm Taxonomy: Embryology in relation to taxonomy, Cytotaxonomy, Chemotaxonomy and Numerical Taxonomy.

UNIT- II

4. Nomenclature and Taxonomic resources: An introduction to ICBN, Vienna code - a brief account. Herbarium: Concept, techniques and applications.
5. Systematic study and economic importance of plants belonging to the following families.

(a) Annonaceae (b) Malvaceae (c) Rutaceae

Fabaceae ((d) Faboideae/papilionoideae, (e) Caesalpinioideae, (f) Mimosoideae),

(g) Cucurbitaceae (h) Apiaceae (i) Asteraceae

(j) Asclepiadaceae (k) Lamiaceae (l) Amaranthaceae

(m) Euphorbiaceae (n) Orchidaceae (o) Poaceae

UNIT – III

Medicinal Botany:

7. Ethnomedicine: Scope, inter disciplinary nature, distinction of ethnomedicine from focklore medicine. Outlines of Ayurveda, Sidda, Unani and Homeopathic system of traditional medicine. Role of AYUSH, NMPB, CIMAP and CDRI.

8. Plants in primary health care: Common medicinal plants – Tippateega (*Tinospora cordifolia*), tulasi (*Oscimum sanctum*), pippallu (*Piper longum*), Karaka (*Terminalia chebula*), Kalabanda (*Aloe vera*), Turmeric (*Curcuma longa*).

UNIT-IV

9. Traditional medicine vs Modern medicine: Study of select plant examples used in traditional medicine as resource (active principles, structure, usage and pharmacological action) of modern medicine: Aswagandha (*Withania somnifera*), Sarpagandha (*Rauvolfia serpentina*), Nela usiri *(Phyllanthus amarus),* Amla (*Phyllanthus emblica*) and Brahmi (*Bacopa monnieri*).

10. Pharmacognosy:- Introduction and scope Adulteration of Plant crude drugs and methods of identification – Some Examples. Indian pharmacopoeia.

11. Plant crude drugs: Types, Methods of collection, processing and storage practices, evaluation of crude drugs.

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FACULTY OF SCIENCE

MODEL QUESTION PAPER

B. Sc II Yr, IV Semester-End examination

BOTANY (Paper-IV)

(Taxonomy and Medicinal Botany)

Time: 2 ½ Hrs. **Max Marks: 40**

Section – A

(Marks 4 x 8 =32)

Answer all the questions, answer should not exceed 80 lines for each question. Draw well labeled diagrams; wherever necessary.

1. (a) Given an account of Benthem and Hooker system of classification and mention its merits and demerits.

   (or)

   (b) Describe the modern trends in Taxonomy.

2. (a) Describe the floral characters of Asclepidaceae and mention its pollination mechanism.

   (or)

   (b) Compare the floral characters of Fabaceae,Caesalpinaceae and Mimosaceae.

3. (a) Describe the various systems of Indian medicine.

   (or)

   (b) Give a general account of any two plants used in primary health care.

4. (a) Describe the processing and storage practices of crude drugs.

   (or)

   (b) Describe the active principles and pharmacological action of any two medicinal plants.

Section – B

(Marks 4 x 2 =8)

Attempt any four questions, answer should not exceed 20 lines.

1. Natural calssification
2. Cytotaxonomy
3. Economic importance of Fabaceae
4. Advanced features of Asteraceae
5. CIMAP
6. Tippa teega
7. Indian Pharmacopoeia
8. Aswagandha

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NAGARJUNA GOVERNMENT COLLEGE, NALGONDA

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BOTANY

B.Sc II Year **Practical Syllabus**

Academic Year 2014-15

Paper – II

(Anatomy, Embryology, Taxonomy and Medicinal Botany)

(Total Hours of Laboratory Exercises: 90 @ 3 hr/Week in 30 sessions)

Suggested Laboratory Exercise:

1. Demonstration of double staining technique.
2. Tissue organization in root and shoot apices using permanent slides.
3. Preparation of double staining slides
   Primary structure: Root – Cicer, Canna; Stem – Tridax, Sorghum
   Secondary structure: Root – Tridax sp; Stem – Pongamia
4. Stomatal types using epidermal peels.
5. Microscopic study of wood in T.S., T.L.S.and R.L.S with the help of permanent slides.
6. Structure of anther and microsporgenesis using permanent slides.
7. Structure of pollen grains using whole mounts (Catharanthus, Hibiscus, Acacia and Grass)
8. Pollen viability test using in-vitro germination (Catharanthus) evans blue method.
9. Study of ovule types and developmental stages of embryosac.
10. Structure of endosperm (nuclear and cellular); Developmental stages of dicot and monocot Embryos using permanent slides
11. Isolation and mounting of embryo using (Cyamopsis/Senna/Crotalaria) young fruit.
12. Systematic study of locally available plants belonging to the families prescribed in theory syllabus (Minimum of one plant representative for each family)
13. Demonstration of herbarium techniques
14. Local field visits to study the vegetation and flora
15. Detailed morphological and anatomical study of medicinally important part(s) of locally available plants (a minimum of 10 plants) used in traditional medicine.
16. Field visits to identify and collect ethno medicinal plants used by local tribes/folklore
17. Preparation and submission of 25 herbarium specimens for evaluation during the practical examination.

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NAGARJUNA GOVERNMENT COLLEGE, NALGONDA

(AUTONOMOUS, RE-ACCREDITED BY NAAC WITH "A" GRADE)

Model Question Paper for B.Sc II Year Practical Examination

SUBJECT: - BOTANY

(Anatomy, Embryology, Taxonomy and Medicinal Botany)

Time: 3 Hrs, **Max.Marks:50**

I. Section cutting and preparation of permanent slide by double staining method. (A) 1 x 8 = 08

II. Prepare the temporary mount of epidermal peel from given leaf material and identify stomatal types. (B) 1 x 6 = 06

III. Pollen viability test (C) 1 x 6 = 06

IV. Description of vegetative and floral characters of given plant twigs 'D' and 'E' with floral formula and floral diagrams. 2 x 8 = 16

V. Comment on spotters (F, G, H, I) 4 x 2 = 08

VI. Record and Herbarium 4 + 2 = 06

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NAGARJUNA GOVERNMENT COLLEGE, NALGONDA

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BOTANY (Paper-V)

B. Sc **III** Year **V** SEMESTER SYLLABUS (2014-15)

(Cell Biology and Genetics)

UNIT – I

CELL BIOLOGY:

1. **Plant cell envelops:** Ultra structure of cell wall, molecular organization of cell membranes.

2. **Nucleus:** Ultra structure, nucleic acids, structure and replication of DNA, types and functions of RNA.

UNIT – II

3. **Chromosomes:** Morphology, organization of DNA in a chromosome, euchromatin and heterochromatin, Karyotype.

4. **Special types of Chromosomes:** Lampbrush, Polytene and B-Chromosomes.

5. **Cell division**: cell cycle and its regulation; mitosis, meiosis and their significance.

UNIT – III

GENETICS:

6. **Mendelism:** Laws of inheritance, genetic interactions – Epistasis, complementary, supplementary and inhibitory genes.

7. **Linkage and crossing over:** A brief account, construction of genetic maps-2 point and 3 point test cross data.

UNIT – IV

8. **Mutations:** Chromosomal aberrations-structural and numerical changes; Gene mutations.

9. **Gene Expression**: Organization of gene, transcription, translation, mechanism and regulation of gene expression in prokaryotes (Lac-operon and Trp-operons).

10. **Extra nuclear genome:** Mitochondrial and plastid DNA, plasmids.

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FACULTY OF SCIENCE

MODEL QUESTION PAPER

B. Sc III Yr, V Semester-End examination

BOTANY (Paper-V)

(Cell Biology and Genetics)

Time: 2 ½ Hrs. **Max Marks: 40**

SECTION – A (Marks 4 x 8 = 32)

Answer all the questions; answer should not exceed 80 lines for each question. Draw well labeled diagrams; wherever necessary.

1. (a) Describe chemical composition and molecular models of plasma membrane.
   (or)
   (b) Explain structure and replication of DNA.

2. (a) Describe the special types of chromosomes.
   (or)
   (b) Write about meiosis and their significance.

3. (a) Explain the mechanism of crossing – over and its significance
   (or)
   (b) Describe gene interactions and write any four types of interactions.

4. (a) Write an essay about translation.
   (or)
   (b) Describe the Mechanism of Lac operon in prokaryote.

SECTION – B (Marks 4 x 2 = 8)

Attempt any four questions; answer should not exceed 20 lines.

1. Histone proteins
2. Types of RNA
3. Heterochromatin
4. Diplotene stage
5. Law of independent assortment
6. Plastid DNA
7. Point mutation
8. Transcription

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NAGARJUNA GOVERNMENT COLLEGE, NALGONDA

(AUTONOMOUS, RE-ACCREDITED BY NAAC WITH "A" GRADE)

BOTANY (Paper-VI)

B. Sc III Year V SEMESTER SYLLABUS (2014-15)

(Tissue culture, Biotechnology, Seed Technology and Horticulture)

UNIT – I

Tissue Culture & Biotechnology

1. **Tissue Culture:** Introduction, sterilization procedures, culture media composition and preparation; explants.

2. **Callus Cultures:** Cell and protoplast culture, somatic hybrids and cybrids.

3. **Applications of Tissue Culture:** Production of pathogen free plants and somaclonal variants, production of stress resistance plants, secondary metabolites and synthetic seeds.

UNIT – II

4. **Biotechnology:** Introduction, history and scope.

5. **rDNA Technology:** Vectors and gene cloning and transgenic plants.

UNIT – III

Seed Technology and Horticulture

6. **Seed:** Structure and types.Seed dormancy, causes and methods of breaking dormancy.

7. **Seed Storage:** Seed banks, factors affecting seed viability, genetic erosion, seed production technology; seed testing and certification.

8. **Horticulture Technology:** Introduction, cultivation of ornamental and vegetable crops, Bonsai and landscaping.

UNIT – IV

9. Floriculture: Introduction. Importance of green house, polyhouse, mist chamber, shade nets; Micro irrigation systems. Floriculture potential and its trade in India

10. **Vegetative propagation of plants:** Stem, root and leaf cutting. Layering and Bud grafting, role of plant growth regulators in horticulture.

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FACULTY OF SCIENCE

MODEL QUESTION PAPER

B. Sc III Yr, V Semester-End examination

BOTANY (Paper-VI)

(Tissue culture, Biotechnology, Seed Technology and Horticulture)

Time: 2 ½ Hrs. **Max Marks: 40**

SECTION – A (Marks 4 x 8 = 32)

Answer all the questions; answer should not exceed 80 lines for each question. Draw well labeled diagrams; wherever necessary.

1. (a) Explain the various steps in tissue culture.
   (or)
   (b) Describe the somatic hybrids and cybrids and their importance.
2. (a) Write a general account of production of stress resistance plant.
   (or)
   (b) Write an essay about vectors, used in gene cloning.
3. (a) Write a general account of seed production technology..
   (or)
   (b) Describe the methods of development of Bonsai.
4. (a) Describe the Floriculture potential and its trade in India.
   (or)
   (b) Explain the layering and bud grafting methods in vegetative propagation.

SECTION – B (Marks 4 x 2 = 8)

Attempt any four questions; answer should not exceed 20 lines.

1. Explants
2. Synthetic seeds
3. Transgenic plants
4. Restriction enzymes
5. Seed Banks
6. Land scaping
7. Green house
8. Role of IAA in Horticulture

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BOTANY (Paper-VII)

B. Sc III Year VI SEMESTER SYLLABUS (2014-15)

(Ecology, Biodiversity and Conservation)

UNIT – I

Ecology:

1. **Ecosystem:** Concept and components of ecosystem, energy flow, food chains, food webs, ecological pyramids, biogeochemical cycles- Carbon, Nitrogen and Phosphorus.

2. **Plants and Environment:** Ecological factors – climatic (light and temperature}, edaphic and biotic, ecological adaptations of plants.

3. **Population Ecology:** Natality, Mortality, Growth curves, ecotypes, ecads.

UNIT – II

4. **Community Ecology:** Frequency, density, cover, life forms, biological spectrum, ecological succession (Hydrosere, Xerosere).

5. **Production Ecology:** Concepts of productivity, GPP, NPP, CR (Community respiration) and secondary production, P/R ratio and ecosystems.

UNIT – III

Biodiversity and Conservation:

6. **Biodiversity:** Concepts, convention on biodiversity – Earth summit. Types of biodiversity.

7. Levels, threats and value of biodiversity.

8. **Hot spots of India** – Endemism, North Eastern Himalayas, Western Ghats.

UNIT – IV

9. **Agro-biodiversity:** Vavilov centers of crop plants.

10. Principles of conservation: IUCN threat-categories, RED data book - threatened & endangered plants of India. Role of organizations in the conservation of Biodiversity - IUCN, UNEP, WWF, NBPGR.

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FACULTY OF SCIENCE

MODEL QUESTION PAPER

B. Sc **III** Yr, **VI** Semester-End examination

BOTANY (Paper-VII)

(Ecology, Biodiversity and Conservation)

Time: 2 ½ Hrs. **Max Marks: 40**

SECTION – A (Marks 4 x 8 = 32)

Answer all the questions; answer should not exceed 80 lines for each question. Draw well labeled diagrams; wherever necessary.

1. (a) Describe the various kinds of ecological pyramids.
   (or)
   (b) Write an essay about biogeochemical cycles.

2. (a) Explain the Raunkier life forms.
   (or)
   (b) Describe the ecological succession of xerosere.

3. (a) Define the biodiversity and explain the types of biodiversity.
   (or)
   (b) Write an account of hot spots of Western Ghats.

4. (a) Describe the vavilov centres of crop plants.
   (or)
   (b) Write an essay about threatened and endangered species of plant community.

SECTION – B (Marks 4 x 2 = 8)

Attempt any four questions; answer should not exceed 20 lines.

1. Food Chain
2. Ecotypes
3. Biological Spectrum
4. GPP, NPP
5. Earth Summit
6. Endemism
7. Red data book
8. Threatened species

NAGARJUNA GOVERNMENT COLLEGE, NALGONDA

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BOTANY (Paper-VIII)

B. Sc **III** Year **VI** SEMESTER SYLLABUS (2014-15)

(Plant Physiology)

UNIT – I

1. **Water Relations:** Importance of water to plant life, physical properties of water diffusion, imbibition, osmosis, water, osmotic and pressure potentials, absorption, and 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; absorption of mineral ions; passive and active processes.
3. **Enzymes:** Nomenclature, characteristics, mechanism and regulation of enzyme action, enzyme kinetics, factors regulating enzyme action.

UNIT – II

4. **Photosynthesis:** Photosynthesis pigments, absorption and action spectra; Red drop and Emerson enhancement effect; concept of two photosystems; mechanism of photosynthetic electron transport and evolution of oxygen; photophosphorylation; Carbon assimilation pathways; C3,C4 and CAM; photorespiration.
5. **Translocation of organic substances:** Mechanism of phloem transport; source-sink relationships.

UNIT – III

6. **Respiration:** Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron transport system, mechanism of oxidative phosphorylation, pentose phosphate pathway.
7. **Nitrogen Metabolism:** Biological nitrogen fixation, nitrate reduction, ammonia assimilation, amino acid synthesis and protein synthesis.

UNIT – IV

8. **Growth and Development:** Definition, phases and kinetics of growth, physiological effects of phytochromes- auxins, gibberellins, cytokinins, ABA, ethylene and brassinosteroids.
9. Physiology of flowering and photoperiodism, role of phytochromes in flowering.

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Model Question Paper for B.Sc III Year Practical Examination

SUBJECT: - BOTANY

(Cell Biology, Genetics & Ecology)

Time: 3 Hrs **Max.Marks:50**

Note: Answer all questions. Draw well labeled diagrams; wherever necessary.

I. Carry out the cytological preparation and staining of the given material and report and any TWO stages of cell division to the Examiners (A).
(Procedure –3marks + Slidepreparation-6marks+Diagram-3 marks+ Inference –3 marks}. 15 M

II. Solve the TWO given Genetics problems: (B,C).
(Working out-3marks+inference-2marks, each problem-5marks) 2x5=10 M

III. Ecology: Carry out analysis of the water sample and estimate the amount of (D).
(Analysis-3marks+Results and inference-2marks) 05 M

IV. Critical notes on (FIVE) spotters of scientific interest: (E, F. G. H. I).
(Identification-1mark+Notes-1mark for each spotter-2marks) 5x2=10 M

V. Viva- Voce (Interactive testing) 05 M

VI. Record(s) and submissions. 05 M

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BOTANY

B.Sc III Year **Practical Syllabus** for **VI** Semester
Academic Year 2014-15
Paper – III
(Cell Biology, Genetics & Ecology)

1. Demonstration of cytochemical methods: Fixation of plant material and nuclear staining.
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 ~~root~~ flower buds.
4. Karyotype study using cytological preparation of dividing root tip cells of Onion/photographs/permanent slides.
5. Solving genetic problems related to monohybrid, dihybrid ratio and interaction of genes (minimum of six problems in each topic)
6. Construction of linkage maps; two point test cross.
7. Knowledge of ecological instruments: Working principles and applications of Hygrometer, rain guaze, anemometer, altameter, light meter, wet and dry bulb thermometer (with the help of Equipment/diagrams/photographs).
8. Determination of soil texture (composition of clay, sand silt etc.)and pH.
9. Study of morphological and anatomical characteristics of plant communities using locally available plant species; Hydrophytes (Eichhornia, Hidrilla, Pistia, Nymphaea, Vallisneria), Xerophytes (Asparagus, Opuntia, Euphorbia antiquorum), Halophytes (Rhizophora, Avecenia).
10. Detailed study on macro flora of a local fresh water body.
11. Estimation of carbonates and bicarbonates in the given sample.
12. Minimum of two field visits to local areas of ecological/Conservation of biodiversity importance (Sacred grove/Reserved forest/Botanical garden/Zoo Park/Lake etc).

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BOTANY

B.Sc III Year Practical Syllabus for VI Semester

Academic Year 2014-15

Paper – IV

(Physiology, Tissue Culture, Biotechnology, Seed Technology and Horticulture)

1. Determination of osmotic potential of vacuolar sap by plasmolytic method using leaves of Rheo/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 biuret method.
7. Isolation and estimation of DNA.
8. Testing of seed viability using 2,3,5-triphenyl tetrazolium chloride (TTC).
9. Demonstration of seed dressing using fungicide to control diseases.
10. Demonstration of seed dressing using biofertilizer (Rhizobium) to enrich nutrient supply.
11. Study on tools/equipment used in horticulture: Rake, hoe, spade, trowel, digger, pick-axe, shade net, glass house and mist chamber.
12. Demonstration of vegetative plant propagation: Rooting of cuttings – Leaf and Stem; layering; stem, bud and wedge grafting.
13. Study on the application of plant growth regulator (IBA) for rooting of cuttings using ornamental plants.
14. Knowledge of instruments and facilities used in plant tissue culture using equipment/photographs. Preparation of plant tissue culture medium.
15. Demonstration of micro propagation using explants like axillary buds and shoot meristems (inoculation of explants).
16. Study of biotechnology products: Samples of antibiotics, vaccines, biofertilizers, single cell protein, cosmetics; photographs of transgenic plants, multiple shoots and Artificial/synthetic seeds.
17. Study visits to places of horticultural and biotechnological interest Commercial nurseries/Botanical gardens; Biotechnology R&D laboratories/Industries.

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Model Question Paper for B.Sc III Year Practical Examination

SUBJECT: - BOTANY

(Physiology, Tissue Culture, Biotechnology, Seed Technology and Horticulture)

Time: 3 Hrs **Max.Marks:50**

Note: Answer all questions. Draw well labeled diagrams; wherever necessary.

I. Conduct the Physiology experiment allotted to you. Give procedure, results and inference. (A)
(Procedure-3marks+Experimentation-6marks+observations-3marks+inference-3marks) 15 M

II. Conduct the biotechnological experiment allotted to you and write the procedure. (B)
(Preparation-5 marks+Identification-3 marks+Discussion-2 marks) 10 M

III. Describe the given horticultural procedure. (C)
(Observation-2marks+Identification-1mark+analysis-2marks) 05 M

IV. Critical notes on (FIVE) spotters. (D, E, F, G, H)
(Identification-1mark+Notes-1 mark for each spotter) 5x2=10 M

V. Viva – Voce 05 M

VI. Record(s) 05 M

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