

BOARD OF STUDIES IN M.Sc. BOTANY

2022-2023

DEPARTMENT OF BOTANY

SYLLABUS FOR M.Sc. BOTANY



PITHAPUR RAJAH'S GOVERNMENT COLLEGE
Autonomous and Accredited with 'A' Grade by NAAC (3.17 CGPA)
KAKINADA – 533 001, E. G. Dist., ANDHRA PRADESH

Department of Botany

The Board of Studies meeting for **Botany** subject during the academic year 2022-2023 is conducted at the Dept. of Botany on **November 2022** with Smt.P.Sara Lecturer incharge in chair along with the following members.

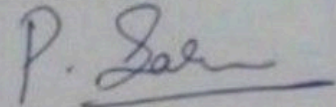
Name, Designation and Address

Signature

Chair Person:

Smt P.SARA

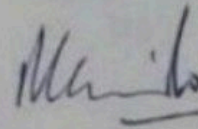
Lecturer in-Charge
Dept. of Botany & Horticulture
PRGC(A), Kakinada



P.G Coordinator:

Capt. Dr. M.KRISHNA RAO

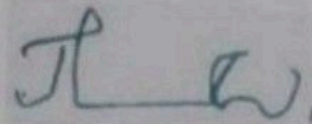
Lecturer in Botany
Dept. of Botany & Horticulture
PRGC(A), Kakinada
Mortha9@gmail.com
9440134559



Adikavi Nannaya University Nominee:

Prof. J.SUNEETHA,

Lecturer in charge of Botany,
Govt. Degree college(A),
Rajahmundry.
Mobile: 9441050910
E-Mail: drjsuneetha@gcrjy.ac.in

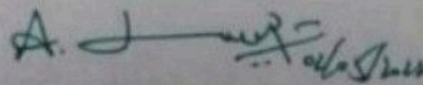


Members Nominated by Executive Council of the College:

Subject Expert 1:

Dr. A.SRINIVASARAO,

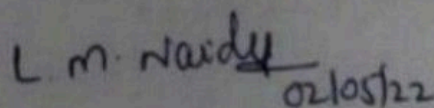
Lecturer in charge of Botany,
Govt. Degree college,
Mandapeta.
Mobile: 8309843949
E-Mail: drannabattulasrao@gmail.com



Subject Expert 2:

Dr. L.Mutyala Naidu

Asst. Professor in Botany,
AKNU,
Rajamahendravaram
Mobile: 9885361145
E-Mail: lagudu3@gmail.com



Name, Designation and Address

Signature

Subject Expert 3:

Dr.P.Madhusudhana Reddy

Associate Professor in Botany,
Yogi Vemana University
Kadapa
Mobile: 9949779166
E-Mail: grassced@yahoo.com

Industrial expert:

Smt P.SWATHI

Assistant Director,
Biological Control Laboratory
Dept. of Agriculture, Kakinada
Mobile: 9848350962
E-Mail: swathi3002@yahoo.com

Alumni Member:

Dr. D R SALOMI SUNEETHA

Professor & Head
Plant Physiology, Biochemistry & Microbiology Dept.
Dr YSR Horticultural University
Venkatramannagudem-534101 W.G Dist
Mobile: 9491608088
Email: salomibiochem@gmail.com

Members from the College:

a. Faculty members

1. **P.Rajesh**
Guest Faculty in Botany
2. **P.Nicee**
Guest Faculty in Horticulture
3. **I.Anni**
Guest Faculty in Botany
4. **G.Mispa Kumari**
Guest Faculty in Botany
5. **G.Lakshmi Chandini**
Guest Faculty in Botany

b. Student members:

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

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

PG BOS meeting held on 2nd May, 2022

PROGRAM OUTCOMES (PO):

PO1. Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO2. Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

PO3. Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.

PO4. Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

PO5. Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.

PO6. Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio- technological changes

PO7. Skill Development: Acquire the knowledge of practical ability in handling apparatus and process of methodology

PROGRAM SPECIFIC OUTCOMES (PSO):

PSO1. Understand the nature and basic concepts of Cell biology, Biochemistry, Taxonomy and Ecology.

PSO2. Analyze the relationships among animals, plants and microbes

PSO3. Perform procedures as per laboratory standards in the areas of Biochemistry, Bioinformatics, Taxonomy, Economic Botany and Ecology

PITHAPUR RAJAH'S GOVERNMENT COLLEGE, Kakinada

M.Sc. Botany - Course Structure

Paper Code	Title of the paper	L	T	P	Total (hrs)/ week	Duration Of Exam(hrs)	Max .Marks	Internal marks	Total Marks	Credits
SEMESTER – I										
Theory										
Core Paper 101	Basic concepts of Viruses, Bacteria, Fungi and Lichens	4	1	3	8	3	75	25	100	4
Core Paper 102	Diversity of Algae, Bryophytes, Pteridophytes and Gymnosperms	4	1	3	8	3	75	25	100	4
Core Paper 103	Principles of Cytology and Cytogenetics	4	1	3	8	3	75	25	100	4
Core Paper 104	Fundamental concepts of cell and Molecular biology	4	1	3	8	3	75	25	100	4
Practicals										
Practicals 105	Basic concepts of Viruses, Bacteria, Fungi and Lichens					3	38	12	50	2
Practicals 106	Diversity of Algae, Bryophytes, Pteridophytes and Gymnosperms					3	38	12	50	2
Practicals 107	Principles of Cytology and Cytogenetics					3	38	12	50	2
Practicals 108	Fundamental concepts of cell and Molecular biology					3	38	12	50	2
Total Marks and Credits for I Semester									600	24
SEMESTER – II										
Theory										
Core Paper 201	Principles of Genetics	4	1	3	8	3	75	25	100	4
Core Paper 202	Principles and practices in plant tissue culture technology	4	1	3	8	3	75	25	100	4
Core Paper 203	Principles of Taxonomy and plants in human welfare	4	1	3	8	3	75	25	100	4
Core Paper 204	Plant development and Reproduction	4	1	3	8	3	75	25	100	4
Practicals										
Practicals 205	Principles of Genetics					3	38	12	50	2
Practicals 206	Principles and practices in plant tissue culture technology					3	38	12	50	2
Practicals 207	Principles of Taxonomy and plants in human welfare					3	38	12	50	2
Practicals 208	Plant development and Reproduction					3	38	12	50	2
Total Marks and Credits for II Semester									600	24

SEMESTER – III										
Theory										
Core Paper 301	Taxonomy of Angiosperms and Plant resource Utilization	4	1	3	8	3	75	25	100	4
Core Paper 302	Plant Development and Reproduction	4	1	3	8	3	75	25	100	4
Core Paper 303	Plant Ecology, Biodiversity and Conservation	4	1	3	8	3	75	25	100	4
Core Paper 304	Plant Physiology	4	1	3	8	3	75	25	100	4
Practicals										
Practicals 305	Taxonomy of Angiosperms and Plant resource Utilization					3	38	12	50	2
Practicals 306	Plant Development and Reproduction					3	38	12	50	2
Practicals 307	Plant Ecology, Biodiversity and Conservation					3	38	12	50	2
Practicals 308	Plant Physiology					3	38	12	50	2
Total Marks and Credits for III Semester									600	24
SEMESTER – IV										
Theory										
Core Paper 401	Genetic Engineering of Plants and Microbes	4	1	3	8	3	75	25	100	4
Core Paper 402	Evolution and Plant Breeding	4	1	3	8	3	75	25	100	4
Core Paper 403	Ecology and Environmental Biology	4	1	3	8	3	75	25	100	4
Core Paper 404	Plant Metabolism	4	1	3	8	3	75	25	100	4
Practicals										
Practicals 405	Genetic Engineering of Plants and Microbes					3	38	12	50	2
Practicals 406	Evolution and Plant Breeding					3	38	12	50	2
Practicals 407	Ecology and Environmental Biology					3	38	12	50	2
Practicals 408	Plant Metabolism					3	38	12	50	2
Project Presentation 409									100	4
Total Marks and Credits for IV Semester									700	28
Grand Total Marks and Credits for I,II,III & IV Semesters 2500 100										
L : Lecture hours; T : Tutorial hours; P : Practical hours										
Scheme of Examination at the end of each semester										
Theory Pass Minimum : 40%										
Practical Pass Minimum : 50 % (External 19 / 38 M & Internal 0 / 12 M = Total marks must be 25)										
Aggregate : 50 %										

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
M.Sc. – BOTANY, SEMESTER – I,
PAPER CODE: 101: BASIC CONCEPTS OF VIRUSES, BACTERIA, FUNGI AND LICHENS

UNIT-I : VIROLOGY

- 1) Historical events in development of Virology; shapes, symmetry of viruses ; ultra-structure and chemistry of viruses Corona & Pox virus; Baltimore classification of viruses;
- 2) Replication of Retroviruses and transmission of plant viruses
- 3) Plant disease symptoms due to viral particles
- 4) Prions, Viroids and Virusoids

UNIT – II : SPECIAL BACTERIA & EUBACTERIA

- 1) General characteristics of Mycoplasma
- 2) General characteristics of Bacteria-positive and negative types; cell wall biogenesis, Nutrition in Bacteria
- 3) Genetic recombination in Bacteria (Transformation, Transduction and Conjugation)
- 4) Economic importance of Bacteria in agriculture, pharmaceutical and food

UNIT –III : FUNGI

- 1) General characteristics of Mastigomycotina, Zygomycotina, Ascomycotina, Basidiomycotina, Deuteromycotina.
- 2) Ainsworth classification
- 3) Ultra structure of fungal cell
- 4) Nutrition of fungi—saprophytic, bio trophic and symbiotic

UNIT – IV : LICHENS

- 1) Economic importance of fungi
- 2) Mushroom cultivation-- Button mushroom
- 3) Cultivation of Morchella
- 4) Lichens - Types, ultra structure, reproduction, ecological and economic value

SUGGESTED LABORATORY EXERCISES

- 1) Structure of Viruses using ultra microphotographs (TEM & SEM)
- 2) Symmetry of Viruses (photographs)
- 3) Isolation and purification of Viruses (demo)
- 4) Gram staining of Bacteria
- 5) Different types of Bacteria – Identification (morphology)
- 6) Culture media preparation
- 7) Isolation and culture of Bacteria
- 8) Morphological identification of fungi-type study
- 9) Isolation and culture of fungi
- 10) Viral diseases: Tobacco mosaic diseases, Bhendi vein clearing
Bacterial diseases: Leaf blight of Rice, Red stripes of sugar cane
Fungal diseases: Early blight disease of potato, Smut disease of Jowar

SUGGESTED READINGS & TEXT BOOKS

1. Kaursethi I and Surinder KW 2011. Text Book of Fungi and their Allies. Macmillan publishers, New Delhi, India.
2. Ram Reddy S & Reddy SM 2007. Essentials of Virology. Scientific publishers, Jodhpur, India.
3. Sharma K 2005. Manual of Microbiology Tools and Techniques. Ane Book, New Delhi, India.
4. Matthew RH 2004. Plant virology. 4th edition. Academic press an imprint of Elsevier, California, USA.
5. Prescott et al. 2003. Microbiology. McGraw Hill Education, New York.
6. Aneja KR 2003. Experiments in Microbiology, Plant pathology and Biotechnology. New Age International publishers, New Delhi.
7. Verma HN 2003. Basics of plant Virology. IBH publishing co. Pvt. Ltd., New Delhi.
8. Mehrotra KS and Aneja KR 2003. An Introduction to Mycology. New Age International Publishers, New Delhi.
9. Sullia SB and Shantharam S 2001. General Microbiology. Oxford and IBH publishing Co. Pvt. Ltd, New Delhi.
10. Reddy SM and Ram Reddy S 2000. Microbiology a Laboratory Manual. BSC Publishers and Distributors, Hyderabad.
11. Flint SJ, Enquist LW, Krug RM, Racaniello VR, Skalka AM 2000. Principles of Virology, Molecular Biology, Pathogenesis and Control. ASM press, Washington DC.
12. Rao AS 1999. Introduction to Microbiology. Prentice Hall of India Pvt. Ltd., Delhi.
13. Paul S 1995. Bacteria in Biology, Biotechnology and Medicine. 5th edition. John Wiley and son Ltd., UK.
14. Pelczar, Chan and Krieg 1993. Microbiology. 5th edition. McGraw Hill Education, New York.
15. Stainer RT, Ingraham JL, Wheelis ML and Painter PR 1987. General Microbiology. 5th Edition. Macmillan, London.
16. Smith KM 1968. Plant viruses. Elsevier, New York.
17. Rangaswamy G 1962. Bacterial Plant disease in India. Asia Publishing House, Bombay.
18. Agrios, G.N. 2005. Plant pathology. 5th ed. Academic press.
19. Allen T. Bull. 2004. Microbial diversity and Bioprospecting. ASM Press, Washington.
20. Brock, T.D. & Madigan. 1991. Biology of Microorganisms. Prentice-Hall.
21. Dube, R.C. & D.K. Maheswari 2005. Microbiology. S.Chand & Co. Ltd., New Delhi.
22. Gilbert, O.L. 2000. Lichens. Collins New Naturalist.
23. Ainsworth, G.C. Sparrow, F.K. and Susman, A.S. 1973. The Fungi-An advances treatise, Vol. I to VIB.
24. Alexopoulos, C.J. Mims, C.W. and Blackwel, M. 1996. Introductory Mycology, John Wiley & Sons Inc.

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
M.Sc. – BOTANY, SEMESTER – I,
PAPER CODE: 102: DIVERSITY OF ALGAE, BRYOPHYTES, PTERIDOPHYTES AND GYMNOSPERMS

UNIT –I: ALGAE

General characters; Thallus organization, cell structure, reproduction, life cycles in Chlorophyceae, Bacillariophyceae, Phaeophyceae and Rhodophyceae
Bold and Winny classification of algae

UNIT—II: BRYOPHYTA

General characters; Morphology, anatomy, reproduction in Hepaticopsida, Anthocerotopsida and Bryopsida
Classification of Bryophytes
Ecological and economic importance of Bryophytes

UNIT—III: PTERIDOPHYTA

General characteristics of morphology, anatomy, reproduction in Psilotopsida, Psilophytopsida, Lycopsidea, Sphenopsida and pteropsida
Stelar evolution, Heterospory and Seed habit
Ecological and economic importance of Pteridophytes

UNIT—IV : GYMNOSPERMS& PALEOBOTANY

General characters; Morphology, anatomy and reproduction in Cycadales, Coniferales and Gnetales.
Classification of Sporne
Structure of ovules in different classes of Gymnosperms
Paleobotany—Geological time scale, process of fossilization, types of fossils
General account of Pteridospermales and Pentoxylales

PAPER CODE: 102: DIVERSITY OF ALGAE, BRYOPHYTES, PTERIDOPHYTES AND GYMNOSPERMS

SUGGESTED LABORATORY EXERCISES

1. Examination of vegetative and reproductive morphology of Chlophyceae members.
2. Examination of Thallus structure and reproductive bodies of Xanthophyceae, Bacillariophyceae and Phaeophyceae members.
3. Examination of external and internal structure and reproductive organs of Rhodophyceae and Cyanophyceae members.
4. Field work to get acquaintance with locally available algae.
5. Examination of the external features, anatomy and reproductive structures of Psilotum, Selaginella, Isoetes, Equisetum, Adiantum, Salvinia and Azolla.
Observations of the slides of the following fossil plants:
Rhynia, Lepidodendron, Lepidocarpon, Miadnesia, Sphenophyllum and Calamites.
6. Examination of the external features, anatomy (TS, TLS&RLS) and reproductive structures of Ginkgo, Pinus, Cupressus, Cryptomeria, Araucaria, Ephedra & Gnetum. Study of fossil gymnosperms from prepared slides. Lyginopteris, Lagenostoma, Medullosa, Triganocarpus, Conostoma, Heterangium and Cordaites

SUGGESTED READINGS & TEXT BOOKS

1. Bold, H.C and Wynne.M.J. 1978. Introduction to the algae
2. Chapman, V.J.1962. The Algae
3. Graham, J.E, Lee W. Wilcox & L.E.Graham 2008. Algae. 2nd ed. Benjamin Cummings
4. Fritsch,F.E.1945. The structure and reproduction of Algae Vols. 1& II. Cambridge University Press, London
5. Kumar, H.D.1988.Introductory Phycology
6. Kashyap, S. 1929. Liverworts of the Western Himalayas and Punjab Plains Part I and Part II.
7. Lewin,R.A. 1962. Physiology and Biochemistry of Algae
8. Morris, I 1967. An Introduction to the Algae
9. Presscot, G.W. 1969. The Algae- a review
10. Bernard Goffinet & A. Jonathan Shaw. 2008. Bryophyte Biology. 2nd ed. Cambridge
11. Parihar, N.S. 1991. Bryophyta
12. Puri,P. 1980. Bryophytes
13. Round, E.E. 1986. The Biology of Algae
14. Round, E.E. 1962. Ecology of algae
15. Smith, G.M. 1955. Cryptogamic Botany Vol. II Chopra, R.N. & P.K.Kumar, 1988. Biology of Bryophytes. Wiley Eastern.
16. Arnold, C.A. 1974. An introduction to Paleobotany, New York
17. Agashe, S.N. 1995. Palaeobotany. Oxford & IBH, New Delhi.
18. Bhatnagar, S.P. & Alok Mitra 1997. Gymnosperms. New Age Int. (P) Ltd.
19. Charles C. Beck and Charles B. Beck (Ed.). 1988. Origin and Evolution of Gymnosperms. CUP.
20. Kramer, K.U., P. S. Green & Erich Gvtz. 2008. Pteridophytes and Gymnosperms. Springer.
21. Sambamurty AVSS. 2005. A Textbook of Bryophytes, Pteridophytes, Gymnosperms and Paleobotany. Ik International Pvt Ltd.
22. Vashista, P.C. 2005. Gymnosperms.S. Chand & Co, New Delhi.
23. Vashista, P.C. 2005. Pteridophyta. Rev. ed. By Sinha & Anil, S. Chand & Co, New Delhi.
24. Saxena P and Pathak C. 2012. A Text Book of Pteridophyta., Wisdom Press, New Delhi.
25. Chamberlain, C.J. 1935. Gymnosperms structure and evolution, University of Chicago Press
26. Coulter, J.M. and Chamberlain, C.J. Morphology of Gymnosperms, Central Book Depot, Allahabad
27. Evans, A.J. 1936. Morphology of Vascular Plants (Lower groups) McGraw Hill Book Company, New York

28. Maheswari, P. and Vasil, V. Genetum CSIR (Monographs)

29. Parihar, N.S. 1996. Biology and Morphology of Pteridophytes, Central Book Depot, Allahabad

30. Sporne, K.R. 1962. The Morphology of Pteridophytes, Hutchinson University Library

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
M.Sc. – BOTANY, SEMESTER – I,
PAPER CODE: 103: PRINCIPLES OF CYTOLOGY AND CYTOGENETICS

UNIT – I

Ultra structure of plant cell – Cell wall and Plasma membrane

Ultrastructure of ---

- a) Amembranous cell organelles – nucleus, ribosomes
- b) Single membranous bound cell organelles – endomembrane system
- c) Double membrane bound cell organelles- nucleus, mitochondria, chloroplast

UNIT – II

Structure of prokaryotic and Eukaryotic chromosomes

Chemical nature of chromatin, centromeres and telomeres

Special type of chromosomes – Lamp brush, Polytene and B- chromosome

Chromosome banding techniques – flow cytometry and control microscopy in karyotype analysis

Computerized karyotype analysis

UNIT—III

Chromosomal structural aberrations – Origin, meiosis and breeding behavior of duplications, deficiencies and inversions and interchanges; types of inversions. Robertsonian translocations; Basic concept of complex translocation heterozygotes

UNIT—IV

Numerical changes in chromosomes—Aneuploids and Euploids

Nuclear DNA content –cell cycles, regulations, check points, cyclins and cdks

Experimental control of cell divisions.

Amitosis.

PAPER CODE: 103: PRINCIPLES OF CYTOLOGY AND CYTOGENETICS

SUGGESTED LABORATORY EXERCISES

1. Observation and identification of meiotic stages.
2. Preparation of karyotypes and construction of ideograms
3. Observation of slides/photographs showing structural and numerical aberrations and chromosome banding.

SUGGESTED READINGS & TEXT BOOKS

1. Singh RJ. 2014. Plant Cytogenetics. 2nd Edition. CRC Press, India
2. David M. Prescott. Cells. 1988. Jones and Bartlett Publ. Boston.
3. Gupta, P.K. 1995. Cytogenetics. Rastogi & Company, Meerut.
4. Pierce BA. 2013. Genetics: A Conceptual Approach. 5th Edition. W. H. Freeman, California.
5. Swanson, Merz and Young. Cytogenetics. Prentice Hall. India.
6. Sybenga, J. 1973. General Cytogenetics. North Hall and American Elsevier.
7. C. B. Powar. 1992. Cell Biology. Himalaya Publishers, New Delhi
8. Ajoy Paul. 2015. Text Book of Cell and Molecular Biology. Books and Allied Pvt, Ltd
9. De Robertis E.D.P and E.M.F. De Robertis. Cell and Molecular Biology 2001. CBS Publisher and Distributors.
10. Darnell, Lodish and Baltimore: Molecular Biology, Scientific American Books, New York
11. Bass H and Birchler J. 2011. Plant cytogenetics: Genome structure and chromosome Function Springer, New York

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
M.Sc. – BOTANY, SEMESTER – I,
PAPER CODE: 104 : FUNDAMENTAL CONCEPTS OF CELL AND MOLECULAR BIOLOGY

UNIT –I

Composition and structure of Biomolecules;- Carbohydrates, lipids and proteins (Ramachandran plot, domains, motifs and folds)

Nucleic acids, DNA structure and duplex model A,B & Z forms of DNA

Types of small RNA's, SiRNA, micro RNA and catalytic RNA.

UNIT – II

DNA replication – semi conservative, semi discontinuous and uni & bi directional mode of replication, RNA priming

Enzymes in DNA replication – helicases, SSB, topoisomerases and polymerases

Mechanism of DNA replication – rolling circle, theta mode of replication

Replication ends of chromosomes

UNIT—III

Transcription promoters and Activators.

transcriptions factors and mechanisms of transcription in prokaryotes and eukaryotes, Post-transcriptional modifications.

Translation: Structure of tRNA, Ribosomes as translation factory, genetic code, mechanism of translation, Initiation, elongation and termination

Post translational modifications

UNIT – IV

Regulation of gene expression in Prokaryotes. Basic models: Lac, Arabinose and Trypoperons.

Positive and Negative controls.

Regulation in Viruses: Lytic and Lysogenic cycle.

Regulation of gene expression in Eukaryotes. Britten Davidson model. Role of chromatin in gene expression. DNA methylation. Temporal and spatial regulation. Gene silencing

PAPER CODE: 104 : FUNDAMENTAL CONCEPTS OF CELL AND MOLECULAR BIOLOGY

SUGGESTED LABORATORY EXERCISES

1. Isolation of DNA from Onion bulbs/Banana
 2. Isolation of DNA using CTAB method
 3. Biochemical Tests of Carbohydrates, Proteins and Fats in the plant cells
 4. Assignments on problems related to DNA replication, Transcription, Translation and Gene Regulation
 5. Electrophoresis of seed proteins
-
1. Staining techniques – Study of mitosis using acetocarmine.
 2. Isolation of mitochondria and the activity of its marker enzyme, Succinate dehydrogenase (SDM).
 3. Isolation of chloroplasts and photographs SDS – PAGE technique and photographs - profile of proteins to demonstrate (2) the two subunits of Rubisco.
 4. Isolation of nuclei and identification of histones by SDS-PAGE technique.
 5. Fluorescence staining with FDA for cell viability and wall staining with calcofluor.
 6. Immunofluorescence technique –observation of cytoskeleton.
 7. Demonstration Photographs of SEM and TEM.

SUGGESTED READINGS & TEXT BOOKS

1. Alberts, B, D. Bray, J. Lewis, M. Raff, K. Roberts and J.D.Watson. 2004. Molecular Biology of the Cell Garland Publishing, New York and London
2. Fritsch, E.F. and J. Sambrook. 1992. Molecular cloning: Laboratory Manual. Maniatis, Cold Spring Harbor Laboratory, New York).
3. George M. Malacinski & D. Freifeilder 2005. Essentials of Molecular Biology.
4. Schecleif, R.F. and P.C. Wensik 1991. Practical Methods in Molecular Biology Springer- Verlag.
5. Walker, J. and W. Castra. 1992. Techniques in Molecular Biology. Goom Helns, London.
6. Buchaman B.B., Gruissem, W and Jones R.I. 2000. Biochemistry and Molecular Biology of plants: American Societies of plant physiologists, Maryland, U.S.A.
7. Gupta, P.K. 2002. Cell and Molecular Biology, 3rd Edition, Rastogi Publications, Shivaji Road, Meerut, India.
8. Glick, B.R. and Thompson J.E. 1992. Methods in Plant Molecular Biology and
9. Biotechnology, CRC Press, Boc Raton Florida.
10. Lodish, B.A, Zipursky S.L, Matsdaira P, Baltimore D. and Darnell J. 2000. Molecular Cell Biology (4th edition). W.H. Freeman & co. New York, USA.
11. Lewin B, 2000. Genes VII Oxford University Press, New York.
12. Shaw, C.H. 1998. Plant Molecular Biology. A practical approach, IRL Press, Oxford.
13. R F Weaver 1999, Molecular Biology, WCB McGraw-Hill.
14. Raghavan V. 1997. Molecular Biology of Flowering plants. Cambridge University press, New York, USA.

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
M.Sc. – BOTANY, SEMESTER – II,
PAPER CODE: 201: PRINCIPLES OF GENETICS

UNIT –I

Mendelism principles of genetics, test cross, back cross, T-test, Chi-square test
Gene interaction – Epistasis, supplementary, complementary, duplicating genes
Multiple allelism – pseudoalleles, phenocopies, pleiotropism, penetrance and expressivity

UNIT—II

Non-mendelian genetics – linkage – complete, incomplete and its significance
Crossing-over, stern experiment, cytological evidence
Theories on crossing over, significance, gene mapping, 2-point test cross, 3 point test cross
Tetrad analysis in Neurospora.
LOD –score analysis

UNIT—III

Sex linked, sex limited, sex influenced inheritance
Recombination and its molecular mechanism; role of rec A,B,C,D enzymes; Holiday's model
Mutations – types – molecular basis; site-directed mutagenesis – DNA damage and repair mechanisms; examples of inherited defects in DNA repair.
Multigene families and their organization and significance; Transposable elements in Prokaryotes and eukaryotes, Mechanism of transposition; significance of transposable elements

UNIT-IV

Fine structure of gene, gene concept- one gene one enzyme all concepts.
Maternal inheritance – distinction between nuclear and cytoplasmic types of inheritances- distinction.
Genetics of mitochondria and cytoplasmic characters; Male sterility; types and significance
Mapping in bacteria and phages – methods using conjugation, transformation and transduction

PAPER CODE: 201: PRINCIPLES OF GENETICS

SUGGESTED LABORATORY EXERCISES

1. Observation of types of chlorophyll mutants.
2. Problems in Mendelian Genetics, Gene interactions and Epistasis, Probability laws and Chi-Square test
3. Chromosome Mapping and Tetrad analysis

SUGGESTED READINGS & TEXT BOOKS

1. William K, Cummings S, Spencer MR and Charlotte A. 2013. Essentials of Genetics. Pearson Books, Delhi.
2. Griffiths, A.J.F., Miller, H.T., Suzuki, Lewontin, Gelbart Intd. Genetic analysis, H.F. Freeman and Co.
3. Hartl, D.L. and Jones, E.W. 1998. Genetics: Principles and Analysis (4th edition) Jones and Bartlett Publishers, Massachusetts, USA.
4. Karp, G. 1999. Cells and Molecular Biology: concepts and Experiments. Hohn Wiley & Sons Inc. USA.
5. Lewin, B. 2000. Gene VII. Oxford University Press, New York, USA.
6. Lewis, R. 1997. Human Genetics: Concepts and Applications, WCB Mc Graw Hill, USA.
7. Malacinski, G.M. and Freifelder, D. 1998. Essentials of Molecular Biology (3rd edition). Jones and Bartlet Publishers Inc. London.
8. Russel PJ. 2009. Genetics–A Molecular Approach. 3rd Edition. Pearson Benjamin Cummings, San Francisco, USA.
9. Snustad, D.P. and Simons, M.J., 2000. Principles of Genetics John Wiley and Sons Inc., USA.
10. Brooker R. 2008. Genetics, Analysis and Principles. 3rd edition. McGraw Hill Science.

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
M.Sc. – BOTANY, SEMESTER – II,
PAPER CODE: 202: PRINCIPLES AND PRACTICES IN PLANT TISSUE CULTURE
TECHNOLOGY

UNIT – I

Concept Totipotency, Totipotency/pluripotency; Differentiation, dedifferentiation, redifferentiation

Tools used in tissue culture

Sterilization methods –Physical and chemical

Media components – composition

Explants – types

UNIT-II

Organ culture

Vegetative culture: Root, Stem, Leaf and Meristem

Reproductive culture: Embryo, Endosperm, Ovule, Pollen, Anther and

Callus culture

Regeneration – Biochemical & molecular aspects of tissue culture

Organogenesis and adventive embryo genesis

UNIT—III

Methods of androgenic & gynogenic haploid and di haploid production and applications in agriculture

Embryo rescue technique

Cell culture: establishment, plating efficiency, induction & selection of mutants.

UNIT-IV

Production of secondary metabolites

Somatic hybridization: Protoplast culture technology

Application of plant tissue culture, clonal propagation, artificial seeds and its applications, Soma clonal variations and its applications,

PAPER CODE: 202: PRINCIPLES AND PRACTICES IN PLANT TISSUE CULTURE
TECHNOLOGY

SUGGESTED LABORATORY EXERCISES

1. General out lay of PTC laboratory
2. Preparation of media
3. Callus induction – Carrot
4. Clonal propagation through meristem cultures
5. Embryo culture – Ground nut
6. Anther culture – Datura/ Tobacco
7. Establishment of cell cultures and determination of growth pattern
8. Determination of Plating efficiencies of cell culture
9. Protoplast isolation and culture
10. Protoplast fusion
11. Observation of different developmental stages of somatic embryo in embryogenic callus
12. Artificial seed preparation

SUGGESTED READINGS & TEXT BOOKS

1. Vasil IK and Thorpe TA. 1994. Plant Cell and Tissue Culture. Kluwer Academic Publishers, Dordrecht, Netherlands.
2. Kalyan Kumar De. 1997. Plant Tissue Culture. NCB Agency, Kolkata.
3. Pullaiah, T. 2009. Plant Tissue Culture. Scientific Publishers, Jodhpur.
4. Razdan, M.K. 2003. An Introduction to Plant Tissue Culture. Oxford & IBH, New Delhi
5. Bhojwani, S.S. and Razdan, M.K. 1996. Plant tissue culture: Theory and Practice (a revised edition) Elsevier Science Publishers, New York, USA
6. Bhojwani, S.S. 1990. Plant Tissue Culture: Applications and Limitations. Elsevier Science Publishers, New York, USA.
7. Callow, J.A. Ford-Lloyd, B.V. and Newbury, H.J. 1997. Biotechnology and Plant Genetic Resources: Conservation and use. CAB International, UK, Oxon
8. Collin, H.A. and Edwards, S. 1998. Plant Cell Culture, Bio scientific Publishers, Oxford, UK
9. Jain, S.M. Sopory, S.K. and Velleux, R.E. 1996. In Vitro Haploid production in Higher Plants, Volumes 1-5. Fundamental aspects and Methods Kluwer Publishers, Dordrecht, the Netherlands.
10. Kartha, K.K. 1985. Cryopreservation of Plant Cells and Organs CRC Press, Boca Roton, Florida, USA
11. Raghavan, V. 1986. Embryogenesis in Angiosperms: A Developmental and Experimental Study. Cambridge University Press, New York, USA
12. Raghavan, V. 1997. Molecular Biology of Flowering plants, Cambridge University press, New York, USA
13. Vasil, I.K. and Thorpe, T.A. 1994. Plant Cell and Tissue Culture. Kluwer Academic Publishers. The Netherlands

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
M.Sc. – BOTANY, SEMESTER – II,
PAPER CODE: 203: PRINCIPLES OF TAXONOMY

Taxonomy verses Biosystematics, taxonomic hierarchy.

Principles used in assessing relationship delimitation of taxa and attribution of rank

Species concept, Binominal nomenclature, ICBN rules, Herbarium techniques

Famous botanical gardens in India

UNIT—II

Different systems of classification: Artificial, Natural and Phylogenic,

Cladistics in taxonomy, merits and demerits in classification

1) Hutchinson 2) Takhtajan 3) Cronquist 4) Thorne 5) Dalhlgren

Comparative account of APG-I to APG-IV

UNIT-III

Evolutionary tendencies in following orders—

1) Ranales 2) Rosales 3) Centrospermales 4) Tubiflorae 5) Ambelliferae 6) Helembiales

1) Liliflorae 8) Glumiflorae

UNIT-IV

Origin and evolution of Angiosperms

Embryology in relation to taxonomy

Palynology in taxonomy, microanatomy and cytology

Phytochemistry in taxonomy

SUGGESTED LABORATORY EXERCISES

Taxonomy of Angiosperms & Plant Resources Utilization and Diversity

1. Description of a Taxa /Species from representative and locally available families
2. Description of various species of a genus: Preparation of key character at genus level
3. Preparation of key characters and use of keys at family level
4. Field trips: Compilation of field notes and preparation of herbarium wild or cultivated
5. Training in using floras and herbaria for identification of specimens wild and cultivated
6. Taxonomic description of the following cultivated Crops
 1. Food crops : Rice, Maize
 2. Pluses : Red gram, Black gram
 3. Fiber crops : Cotton, Sun hemp
 4. Oil yielding : Groundnut, Castor, Brassica
 5. Medicinal & Aromatic : Catheranthus, Eucalyptus

SUGGESTED READINGS & TEXT BOOKS

Taxonomy of Angiosperms

1. Cole, A.J. 1969. Numerical Taxonomy, Academic Pree, London
2. Davis, P.H. and Heywood, V.H. 1973. Principles of Angiosperms Taxonomy. Robert E Kreiger Pub. Co., New York
3. Harrison, H.J. 1971. New concepts in Flowering Plant Taxonomy, Hieman Educational Books Ltd., London
4. Simpson MG. 2006. Plant Systematics. Elsevier Academic Press, California, USA
5. Heywood, V.H. and Moore, D.M. 1984. Current concepts in Plant Taxonomy, Academic Press, London
6. Nordenstam BEI, Lazily G and Kassas M. 2000. Plant systematic for 2nd Century. Portland Press Ltd., London.
7. Jones, S.B. Jr. and Luchsinger, A.E. 1986. Plant Systematics (2 nd Edition) McGraw Hill Book Co., New York
8. Angiosperm Phylogeny Group website. 2012. consult www.apgweb.
9. Heywood, V.H., RK Brummitt, A. Culham, O. Seberg 2007. Flowering Plant Families of the World. Firefly books Ltd. New York.
10. Judd, W. S, Christopher S. Campbell, Elizabeth A. Kellogg, Peter F. Stevens, and Michael J. Donoghue. 2007. Plant Systematics: A Phylogenetic Approach, 3rd ed. Sinauer.
11. Lawrence, G.H.M 1951. Taxonomy of vascular plants. McMillan, New York.

Plant Resources Utilization and Diversity

1. Baker, H.G. 1978. Plants and Civilization (3rd Edition) C.A. Wadsworth, Belmont Chrispeels, M.J. and Sadava, D. 1977. Plants, Food and People. W.H. Freeman and Co., San Francisco
2. Cinway, G. 1999. The Doubly Green Revolution. Food for All in the 21st Century, Penguin Books.
3. Council of Scientific & Industrial Research 1986. The useful plants of India. Publications and Information Directorate. CSIR, New Delhi

UNIT –I

Definition of meristems and permanent tissues, classification and characteristics of different meristematic tissues

Simple tissues: Parenchyma, Collenchyma, Sclerenchyma

Complex tissues: Xylem and Phloem

Special tissues

Tissue systems in plants: Epidermal, Ground, Vascular tissue systems

Organization of the Shoot apical meristem (SAM) and Root apical meristem (RAM),

UNIT-II

Cambium: Structure, cell types and development of vascular cambium, Cork cambium - structure of its derivatives; bark. Anomalous secondary growth in dicot and monocot stems

Vascular tissue development: development and structure of primary xylem, primary phloem, secondary xylem and secondary phloem

UNIT—III:

Male gametophyte: Structure of anther; Microsporogenesis; Types and role of tapetum; pollen development, Sperm dimorphism; Pollen embryo sacs.

Female Gametophyte: Types of Ovule, development of Ovule, Megasporogenesis,

UNIT—IV

Types of Embryo sacs, Organization of Embryo sac; ultra-structure of the embryo sac cells.

Pollination, Pollen-pistil interaction: Structure of pistil; pollen-stigma interactions; self-incompatibility, different methods to overcome self-incompatibility

PAPER CODE: 204: PLANT DEVELOPMENT AND REPRODUCTION

SUGGESTED LABORATORY EXERCISES

1. Microscopic studies of leaf anatomy: Nerium, Maize observation of trichomes, glands. Study of C₃ and C₄ plant anatomy
2. Study of Stomatal types and determination of Stomatal frequency and Stomatal Index
3. Study of wood anatomy, macerations and sections, T.S., T.L.S. and R.L.S
4. Study of anomalous growth of stems: Aristolochia, Achyranthes, Bignonia, Boerhaavia, Leptodenia and Dracaena

Reproduction

1. Study of microsporogenesis and gametogenesis in anthers
2. Tests for pollen viability using stains and in vitro germination
3. Slide preparation of Embryo sac
4. Slide preparation of nuclear and cellular endosperm
5. Tests for Seed viability

SUGGESTED READINGS & TEXT BOOKS

Plant Development

1. Bailey, J.D. and Black, M. 1994. Seeds: Physiology of development and Germination, Plenum Press, New York.
2. Fahn, A. 1982. Plant Anatomy. (3rd edition). Pergamon Press, Oxford
3. Fosket, D.E. 1984. Plant Growth and Development. A Molecular approach. Academic Press, San Diego
4. Howell, S.H. 1998. Molecular Genetics of Plant Development Cambridge University Press
5. Lyndon, R.F. 1990. Plant Development. The Cellular Basis. Uni Hyman, London
6. Mauseth, J.D. 1988. Plant Anatomy. Benjamin Cummings. California
7. Pullaiah, T., Naidu, K.C., Lakshminarayana, K and Hanumantha Rao, B. 2007. Plant Development. Regency Publications, New Delhi
8. Salisbury, F.B. and Ross, C.W. 1992. Plant Physiology (4th edition) Wordsworth Publishing, Belmont, California
9. Steeves, T.A. and Susses, I.M. 1989. Patterns in Plant Development (2nd edition), Cambridge University Press, Cambridge
10. Waisel, Y., Eshel, A. and Kafkaki, V. (eds) 1996. Plant Roots: The Hidden Hall (2nd edition). Marcel Dekker, New York

Reproduction

1. Johri, B.M 1984. Embryology of Angiosperms springer-Verlag. Berlin
2. Johri, B.M. 1981. Experimental embryology of vascular plants. Springer Verlag, Berlin
3. Maheshwari, P. 1980. An introduction to the Embryology of Angiosperms, Tata,mcgrawin
4. Bhojwani, S.S and Bhatnagar, S.P. 2000. The Embryology of Angiosperms (4th revised and enlarged edition) Vikas Publishing House, New Delhi
5. Leins, P., Tucker, S.C. and Endress. P.K. 1988. Aspects of Floral Development. J. Cramer, Germany
6. Procter, M. and Yeo, P. 1973. The Pollination of Flowers. William Collins Sons, London
7. Pulliah, T., Lakshminarayana, K and Hanumantha Rao, B., 2008. Plant Reproduction, Scientific Publishers, Jodhpur, India
8. Raghavan, V. 1997. Molecular Embryology of Flowering Plants. Cambridge University Press, Cambridge
9. Raghavan, V. 1999. Developmental Biology of Flowering Plants. Springer – Verlag, New York
10. Sedgely, M. and Griffin, A.R. 1989. Sexual Reproduction of Tree Crops, Academic Press, London

11. Shivanna, K.R. and Swahney, V.K. (Eds.) 1997. Pollen Biotechnology for Crop Production and Improvement. Cambridge University Press, Cambridge
12. Shivanna, K.R. and Rangaswamy, N.S. 1992. Pollen Biology, A Laboratory Manual. Springer-Verlag, Berlin
13. Shivanna, K.R. and Johri, B.M.1985. The Angiosperm Pollen Structure and Function, Wiley Eastern Ltd., New Delhi
14. The Plant Cell. Special Issue on Reproductive Biology of plants, Vol.5 (10) 1993. The American Society of Plant Physiologists, Rockville, Maryland, USA

Time: Three Hours

Maximum Marks: 75

SECTION – A

Answer all questions

(15 x 4 = 60 Marks)

1. (a) Give an account on Transmission of viruses
OR
(b) Describe the structure of Corona virus
2. (a) Describe the Reproduction in Bacteria
OR
(b) Give an account of Nutrition in Bacteria
3. (a) What are the criteria for fungal classification? Write a brief account of Ainsworth classification.
OR
(b) Write an essay on general characteristics of Mastigomycotina
4. (a) Give a detailed account on Mushroom cultivation.
OR
(b) Describe the structure and reproduction of Lichens

SECTION – B

Answer any FIVE of the following

(5 x 3 = 15 Marks)

5. Growth of bacteria
6. Isolation of viruses
7. Pox virus
8. Ultra structure of fungal cell
9. Important characteristics of Basidiomycotina
10. Heterothallism
11. Phylogenic trends in Fungi
12. Prions

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

M.Sc. – BOTANY, SEMESTER – I Model Paper

PAPER CODE: 102: DIVERSITY OF ALGAE, BRYOPHYTES, PTERIDOPHYTES AND GYMNOSPERMS

(W.e.f. 2022-2023 Admitted Batch)

Time: Three Hours

Maximum Marks: 75

SECTION – A

Answer all questions

(15 x 4 = 60 Marks)

1. (a) Elaborate on the Thallus diversity in Algae
OR
(b) Criteria used in classification of Algae with special reference to Bold and Winny classification
2. (a) Detail the development of Antheridium, Archegonium in the order Jungermanniales
OR
(b) Give a general account of Anthocerotales
3. (a). Describe salient features and classification of Pteridophyta
OR
(b). Differentiate between Lycopsidea and Sphenopsida
4. (a). Describe the structure and reproduction in Gnetales
OR
(b). Explain the process of fossilization and types of fossils

SECTION – B

Answer any five Questions of the following

(5 x 3 = 15 Marks)

5. Types of reserve food in algae
6. Myxophycean characteristics
7. Economic importance of Bryophytes
8. Thallus types in Marchantiales
9. Heterospory
10. Seed habit
11. Different Ovules in Gymnosperms
12. Geological time scale

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

M.Sc. – BOTANY, SEMESTER – I Model Paper

PAPER CODE: 103: PRINCIPLES OF CYTOLOGY AND CYTOGENETICS

(W.e.f. 2022-2023 Admitted Batch)

Time: Three Hours

Maximum Marks: 75

SECTION – A

Answer all questions

(15 x 4 = 60 Marks)

1. (a). Describe the ultra-structure of plant plasma membrane
OR
(b). Describe the ultra-structure of Nucleus
2. (a). Explain the molecular organization of centromeres and telomeres
OR
(b). Give an account of chromosome banding and its applications
3. (a). Give a brief account of chromosomal structural aberrations and explain their meiotic behavior
OR
(b). Elaborate on Aneuploids and their significance in human genetics
4. (a). Write briefly about cell cycle and its regulation
OR
(b). Write about the mechanism of apoptosis giving its significance

SECTION – B

Answer any five Questions of the following

(5 x 3 = 15 Marks)

5. Karyotype
6. Polytene chromosome
7. Robertsonian translocation
8. Trisomics
9. C- value paradox
10. Arabidopsis
11. Cyclins and cdks
12. Differentiate Proto-oncogenes and Oncogenes

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
M.Sc. – BOTANY, SEMESTER – I Model Paper
PAPER CODE: 104: FUNDAMENTAL CONCEPTS OF CELL MOLECULAR BIOLOGY
(W.e.f. 2022-2023 Admitted Batch)

Time: Three Hours

Maximum Marks: 75

SECTION – A

Answer all questions

(15 x 4 = 60 Marks)

1. (a) Describe the composition and structure of Proteins.
OR
(b) Give detailed account on composition and structure of DNA.
2. (a) Describe the mechanism of DNA Replication.
OR
(b) Explain the process and enzymes involved in Transcription and post transcription activities.
3. (a) Describe the mechanism of Translation.
OR
(b) What is meant by Protein sorting? Discuss the process of targeting of proteins into chloroplasts.
4. (a) Give a critical account on regulation of gene expression in Eukaryotes.
OR
(b) Write an essay on regulation of gene expression with special reference to Lac & Tryp operons.

SECTION – B

Answer any FIVE of the following

(5 x 3 = 15 Marks)

5. Ramachandran plot
6. Micro RNA
7. Okazaki fragments
8. Replication of ends of chromosomes
9. Structure of tRNA
10. Protein trafficking
11. Gene silencing
12. Lytic and Lysogenic cycle

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
M.Sc. – BOTANY, SEMESTER – II Model Paper
PAPER CODE: 201: PRINCIPLES OF GENETICS
(W.e.f. 2022-2023 admitted batch)

Time: Three Hours

Maximum Marks: 75

SECTION – A

Answer all questions

(15 x 4 = 60 Marks)

1. (a) Give an account of Gene interaction
OR
(b) Write about Multiple allelism
2. (a). Write about tetrad analysis and its significance
OR
(b). What is Recombination and its molecular mechanism
3. (a). Discuss the DNA damage and repair mechanisms
OR
(b). Describe the organization and importance of Multigene families
4. (a). Describe the genetic basis of mitochondrial and chloroplast related characters
OR
(b). What are the different methods of gene mapping in bacteriophages?

SECTION – B

Answer any five Questions of the following

(5 x 3 = 15 Marks)

5. Chi square test
6. Penetrance and Expressivity
7. Three point test cross
8. Holliday model
9. Site directed mutagenesis
10. Transposons
11. Maternal inheritance
12. Male sterility

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
M.Sc – BOTANY, SEMESTER – II Model Paper
PAPER CODE: 202: PRINCIPLES AND PRACTICES IN PLANT TISSUE CULTURE TECHNOLOGY
(W.e.f. 2022-2023 Admitted Batch)

Time: Three Hours

Maximum Marks: 75

SECTION – A

Answer all questions

(15 x 4 = 60 Marks)

1. (a) Explain various tools used in Tissue culture.

OR

(b) Write in detail about Tissue culture cycle and add a note on composition and effects of media components.

2. (a). Describe the Embryo culture

OR

(b). Explain the biochemical and molecular aspects of tissue culture

3. (a) Describe the methods of Androgenic & Gynogenic haploid production

OR

(b) What is Somatic hybridization? Give its achievements and limitations.

4. (a) What are secondary metabolites? Enumerate the secondary metabolites of plant origin and state their importance.

OR

(b) Elucidate the method of Clonal propagation and give its importance.

SECTION – B

Answer any FIVE of the following

(5 x 3 = 15 Marks)

5. Sterilization methods

6. Totipotency

7. Embryo rescue

8. Somatic embryogenesis

9. Plating efficiency

10. Protoplasts in genetic transformation

11. Artificial seeds

12. Clonal variations

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

M.Sc. – BOTANY, SEMESTER – III Model Paper

PAPER CODE 203: PRINCIPLES OF TAXONOMY AND PLANTS IN HUMAN WELFARE

Time: Three Hours

(W.e.f. 2022-2023 Admitted Batch)

Maximum Marks: 75

SECTION – A

Answer all questions

(15 x 4 = 60 Marks)

1. (a). Discuss the different Species Concept
OR
(b). Give an account of International Code of Nomenclature
2. (a). What is APG System of classification. Discuss about its significance
OR
(b). Discuss Cronquist's classification with its merits and demerits
3. (a). Elaborate on the evolutionary tendencies in Tubiflorae
OR
(b) Elaborate on the evolutionary tendencies in Rosales
4. (a). Discuss on the role of Phytochemistry in Taxonomy
OR
(b) Explain origin and evolution of Angiosperms

SECTION – B

Answer any Five of the following

(5 x 3 = 15 Marks)

5. Taxonomic hierarchies
6. Nomenclature
7. Cladistic analysis
8. α -Taxonomy
9. Amentiferae
10. Microanatomy
11. Liliiflorae
12. Herbarium technique

M.Sc. – BOTANY, SEMESTER – II Model Paper
PAPER CODE 204: PLANT DEVELOPMENT AND REPRODUCTION
(W.e.f. 2022-2023 Admitted Batch)

Time: Three Hours

Maximum Marks: 75

SECTION – A

Answer all questions

(15 x 4 = 60 Marks)

1. (a) Describe in brief on the Complex tissues you have studied with neat diagrams.
OR
(b) Describe the Epidermal tissue system
2. (a) Write an account of the anomalous secondary growth in dicots with suitable examples.
OR
(b) Describe the structural variations met within the secondary phloem in dicots.
3. (a) Write an essay on the ultra-structure of Tapetum and its functions
OR
(b) Give an illustrated account of the different types of Tetrasporic embryo sacs you have studied
4. (a) Write in detail about the process of Fertilization
OR
(b) Give an account on development of embryo as per Johansen's system.

SECTION – B

Answer any FIVE of the following

(5 x 3 = 15 Marks)

5. Secretory cells
6. SAM
7. Bark.
8. Root microbe interactions
9. Pollen embryo sacs.
10. Pollen stigma interactions.
11. Poly embryony.
12. Seed dormancy.

Smt P.SARA

Lecturer in-Charge
Dept. of Botany & Horticulture
PRGC(A), Kakinada

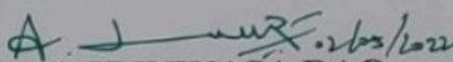

Capt. Dr. M.KRISHNA RAO

Lecturer in Botany
Dept. of Botany & Horticulture
PRGC(A), Kakinada
Mortha9@gmail.com
9440134559

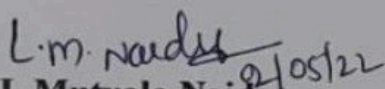


Prof. J.SUNEETHA

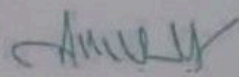
Lecturer in charge of Botany
Govt. Degree college(A),
Rajahmundry
Mobile: 9441050910
E-Mail: drjsuneetha@gcrjy.ac.in


Dr. A.SRINIVASA RAO,

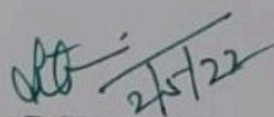
Lecturer in charge of Botany,
Govt. Degree college,
Mandapeta
Mobile: 8309843949
E-Mail:


Dr. L.Mutyala Naidu

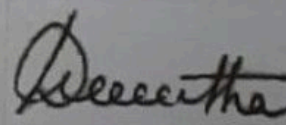
Asst. Professor in Botany,
AKNU,
Rajamahendravaram
Mobile: 9885361145
E-Mail: lagudu3@gmail.com


Dr. P.Madhusudhana Reddy

Associate Professor in Botany,
Yogi Vemana University
Kadapa
Mobile: 9949779166
E-Mail: grassced@yahoo.com


Smt P.SWATHI

Assistant Director,
Biological Control Laboratory
Dept. of Agriculture, Kakinada
Mobile: 9848350962
E-Mail: swathi3002@yahoo.com


Dr. D R SALOMI SUNEETHA

Professor & Head
Plant Physiology, Biochemistry &
Microbiology Dept.
College of Horticulture
Dr. YSR Horticultural University
Venkatramannagudem-534101
W G Dist
Mobile: 9491608088
Email: salomibiochem@gmail.com

Faculty members:

1. **P.Rajesh**
Guest Faculty in Botany

P. Rajesh

2. **P.Nicee**
Guest Faculty in Horticulture

P. Nicee

3. **I.Anni**
Guest Faculty in Botany

I. Anni

4. **G.Mispa Kumari**
Guest Faculty in Botany

G. Mispa

5. **G.Lakshmi Chandini**
Guest Faculty in Botany

G. Lakshmi Chandini