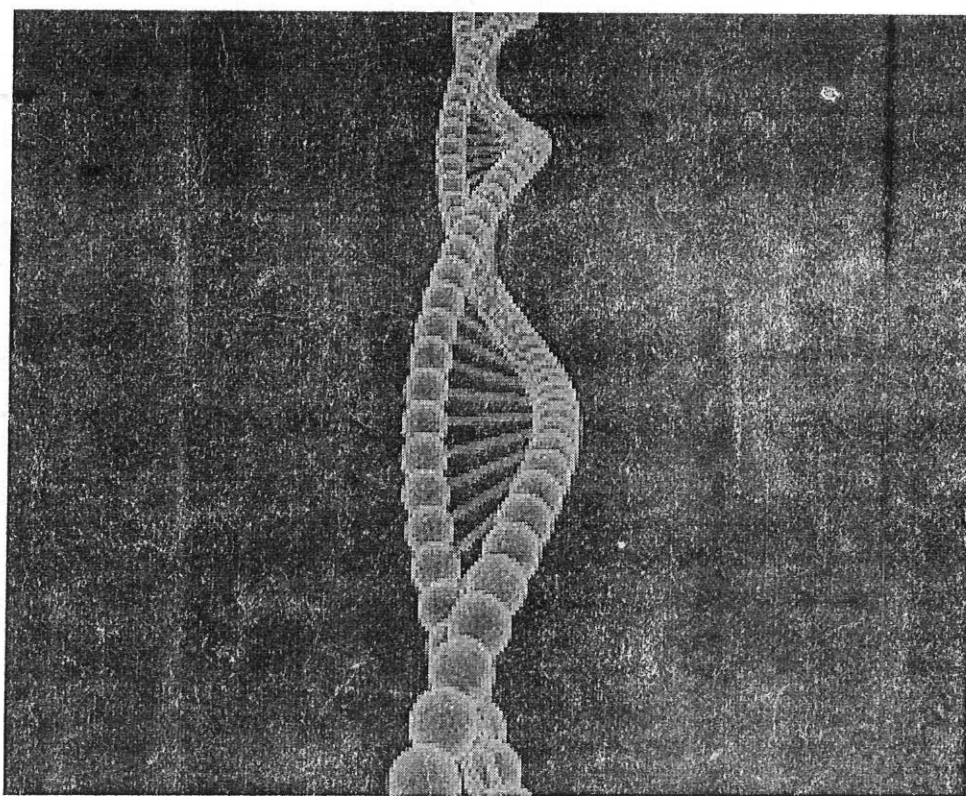


NAGARJUNA GOVERNMENT COLLEGE NALGONDA



*(Autonomous & Reaccredited by NAAC with 'A' Grade)
Affiliated to MAHATMA GANDHI UNIVERSITY*



**DEPARTMENT OF BIOTECHNOLOGY
SYLLABUS & MODEL QUESTION PAERS**

2016-17

Dr. M. RAMCHANDER
Asst. Professor, Dept. of Bio-Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 P P INDIA

Dr. M. RAMCHANDER
Asst. Professor, Dept. of Bio-Chemistry
MAHATMA GANDHI UNIVERSITY
NALGONDA-508254 P P INDIA

From
Dr.Sivaram, Asst.Prof
Department of Biotechnology,
MG University
Nalgonda.


To
Sri Dr.R.Nagender Reddy,M.A.,Ph.D.,
Principal
N.G.College,
Nalgonda.

Sir,

In response to your letter dated ~~20~~-9-2016, I acknowledge my consent to act as
hon'ble member / Subject expert of BOS in your Dept.of Biotechnology , Nagarjuna Govt.
College, Nalgonda.

Thanking you,

Yours Sincerely,


Dr. T. Siva Ram
Asst. Professor
Dept. of Biotechnology
Mahatma Gandhi University
NALGONDA-508 254. T.S. INDIA.


From
Sri Dr, K.Prem Sagar, Asst.Prof
Head Department of Biotechnology
MG University
Nalgonda.

To
Sri Dr.R.Nagender Reddy,
Principal,
N.G.College,
Nalgonda.

Sir,

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Thanking you,

Yours Sincerely,

Dr. Korripally Premsagar
Assistant Professor
Department of Biotechnology
Mahatma Gandhi University
Yellareddyguda, Nalgonda T.S.- 508 254.

From
Dr. M. Ramchander, Asst.Prof
Dept.of Bio-chemistry
MGU.Nalgonda

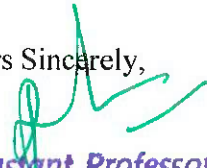
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Assistant Professor
University College of Science & Informatics
Mahatma Gandhi University
Yellareddyguda, NALGONDA - 508 254

**NAGARJUNA GOVERNMENT COLLEGE, NALGONDA
(AUTONOMOUS) ALLOCATION OF CREDITS AT SUBJECT LEVEL**

College: N.G.COLLEGE

Course: B.Sc.,

Subject: BIOTECHNOLOGY

S.No	Semester	Module(Paper)	Hours	Max. Marks	Credits
1	I(Core)	CELL BIOLOGY AND GENETICS	04	100	04
2	II (Core)	NUCLEIC ACIDS AND BIOINFORMATICS	04	100	04
3	Practicals- 1 practical - 2	CELL BIOLOGY AND GENETICS NUCLEIC ACIDS AND BIOINFORMATICS	06	50 50	02 02
4	III (Core)	BIOCHEMISTRY	04	100	03
5	IV (Core)	ENZYMOMOLOGY & BIOCHEMICAL TECHNIQUES	04	100	03
6	Practicals-2	BIOCHEMISTRY ENZYMOLOGY & BIOCHEMICAL TECHNIQUES	03	100	02
7	V Advanced(Core)	MOLECULARBIOLOGY	04	100	03
	Advanced Elective I	GENETIC ENGINEERING&IMMUNOLOGY	03	100	02*
	Advanced ElectiveII	ENVIRONMENTAL BIOTECHNOLOGY	03	100	02*
8	VI Applied(Core)	PLANT AND ANIMALBIOTECHNOLGY	04	100	03
9	Applied Elective I	INDUSTRIAL&ENVIRONMENTA L BIOTECHNOLOGY	03	100	02*
10	Applied Elective II	FOOD SCIENCE AND TECHNOLOGY	03	100	02*
11	Practicals-3 (CORE&ELECTI VE)	MOLECULARBIOLOGY&Genetic engineering/Environmental Biotechnology	03	50 50	02
12	Practicals-4 (CORE&ELECTI VE)	PLANT AND ANIMALBIOTECHNOLGY, Industrial biotechnology/Food science & Technology	03	50 50	02
	TOTAL CREDITS			1400	32
	Project Work	On the given topic		100	03

Amr

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Assistant Professor
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Dr. T. Siva Ram
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Assistant Professor
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DEPARTMENT OF BIOTECHNOLOGY

BOARD OF STUDIES

Board of Studies in the Department of Biotechnology has been constituted with the following members for the year 2016-17.

S.No	Category	Name and Designation
1	Chairman Board of Studies	Sri A.Ramana Rao, Incharge Dept. of Biotechnology, N.G. College.Nlg.
2	University Nominee	1.Dr.K. Prem Sagar, Asst.Prof, Head Dept of Biotechnology, MGU, Nlg.
3	Subject expert- from outside the college	1Dr.T.Sivaram, Asst.Prof, Dept of Biotechnology MGU, Nalgonda. 2. Dr.M.Ramchander,Asst.Prof, Dept of Biochemistry, MGU,Nalgonda.
4	Members: The Faculty Members of the Dept.	1.G.Anjaiah, Guest Faculty. 2.Ayesha, Guest Faculty.

NAGARJUNA GOVERNMENT COLLEGE, NALGONDA

(Autonomous)

DEPARTMENT OF BIOTECHNOLOGY

BOARD OF STUDIES MEETING

The Board of studies in the Department of Biotechnology met on Date 29-9-2016 under the chairmanship of the Board of studies and adopted the following Resolutions.

1. Introduction of Choice Based Credit System(CBCS)for I ,II& IIIyear from academic year 2016-2017
2. Each semester will have 4 units
3. To Conduct 2 (two)internal assignments 30 marks(20 marks for written examination ,5 marks for Assignment and 5 marks for Seminar) for I ,II &III year .
4. It is compulsory to a student to pass in internal exam and to pass in ^{External} ~~Internal~~ examination are has to secure 40% marks.
5. To conducts semester end Examination for 70 marks for I ,II& IIIyear for year .
6. To pass and examination are has to get a minimum of 40% of marks in each paper.
7. Conducting of I internal in the last week of August and II internal in the first week of October of the academic year.
8. To Design the question paper in the following pattern:
In section-A to give 5 Questions and ask the students to answer all Questions(VSA) 5x2=10,
In section-B to give 6 Questions and ask the students to answer 4 Questions (SA) 4x5=20.
In section-C to give 4 Questions with internal choice and ask the students to answer 4 Questions 4x10=40
9. Commencement of All Semester to prepare and supply question Banks (Description & Objective type) to the students.
10. Continuous internal assessment method to evaluate the progress of the students
11. Approved the panel of examiner for paper setting and evaluation for the year 2016-17.

1. Chairman Board of Studies:

Sri A.Ramana Rao,
In-Charge Dept of Biotechnology
N.G. College, Nalgonda.

ARNAO

2. University Nominee

Dr. K.Prem Sagar, Asst.Prof,
Head Dept of Biotechnology,
MGU, Nalgonda.

K.P.S.
Dr. Korrupally Premeagar
Assistant Professor
Department of Biotechnology
Mahatma Gandhi University
Yellareddyguda, Nalgonda T.S.- 508 254.

3. Subject expert-from outside college

1.Dr. T.Sivaram, Asst.Prof
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MGU, Nalgonda.

TS
Dr. T. Siva Ram
Asst. Professor
Dept. of Biotechnology
Mahatma Gandhi University
NALGONDA-508 254. T.S. INDIA.

2.Dr.M,RamchanderAsst.Prof,
Dept of Biochemistry,
MGU,Nalgonda.

M.R.
Assistant Professor

4. Members

Faculty
Members of the Dept.

1. G.Anjaiah,
Guest Faculty

2. Ayesha

Guest Faculty

Ayesha
University College of Science & Informatics
Mahatma Gandhi University
Yellareddyguda, NALGONDA-508 254

**NAGARJUNA GOVERNMENT COLLEGE, NALGONDA
(AUTONOMOUS)**

**B.Sc- I Biotechnology
CELL BIOLOGY AND GENETICS (CBCS)**

SEMESTER-I

**PAPER-I
CORE THEORY-I**

**60 hrs
(4 hrs/ week)**

MODULE-I : Cell structure and Functions

- 1.1. Cell as basic unit of living organisms-bacterial, fungal, plant and animal cells
- 1.2. Ultrastructure of prokaryotic cell (cell membrane and plasmids, Nucleoid)
- 1.3. Ultrastructure of eukaryotic cell (cell wall, cell membrane, nucleus, mitochondria, chloroplast, endoplasmic reticulum, Golgi apparatus, vacuoles)
- 1.4. Fluid mosaic model, Sandwich model, Cell membrane permeability
- 1.5. Structure of chromosome-morphology, components of chromosomes (histones and nonhistones), specialized chromosomes (Polytene, Lampbrush)
- 1.6. Chromosomal aberrations- structural and numerical

MODULE-II: Cell cycle

- 2.1 Bacterial cell division
- 2.2 Eukaryotic cell cycle –phases
- 2.3 Mitosis - Stages (spindle assembly)-significance
- 2.4 Meiosis- Stages (synaptonemal complex)-significance
- 2.5 Senescence and necrosis
- 2.6 Apoptosis

MODULE-III : Principles and mechanism of inheritance

- 3.1 Mendel's experiments- factors contributing to success of Mendel's experiments
- 3.2 Law of segregation- Monohybrid Ratio; Law of independent assortment- dihybrids, trihybrids
- 3.3 Deviation from Mendel's laws- partial or incomplete dominance (eg: Flower Color in *Mirabilis jalapa*), Co-dominance (eg: MN Blood groups), Non allelic interactions-types of epistasis, modification of dihybrid ratios
- 3.4 Penetrance and Expressivity (eg: polydactyly, waardenburg syndrome), pleiotropism, phenocopy- microcephaly, cleft lip
- 3.5 Multiple allelism (eg: Coat color in Rabbits, eye color in *Drosophila* and ABO Blood groups)
- 3.6 X-Y chromosomes - Sex determination in *Drosophila*, Birds, Man, *Bonellia*, X-linked inheritance - Hemophilia, Color blindness, X-inactivation, Y-linked inheritance- Holandric genes

MODULE-IV: Linkage, Recombination and Extension to Mendel's Laws

- 4.1 Linkage and recombination- Cytological proof of crossing over, phases of linkage, recombination frequency, gene mapping and map distance
- 4.2 Non-Mendelian Inheritance – Maternal effect (Shell coiling in snail), variegation in leaves of *Mirabilis jalapa*

- 4.3 Cytoplasmic male sterility in Maize and Paramecium,
- 4.4 Mitochondrial inheritance in human and poky in Neurospora crassa
- 4.5 Chloroplast inheritance in Chlamydomonas
- 4.6 Hardy-Weinberg Equilibrium, allelic and genotypic distribution

CORE-I: PRACTICALS

- 1. Microscopic observation of cells: bacteria, fungi, plant and animal
- 2. Preparation of different stages of Mitosis (onion root tips)
- 3. Preparation of different stages of Meiosis (grasshopper testis)
- 4. Preparation of Polytene chromosome from Drosophila salivary gland
- 5. Identification, maintenance and culturing of Drosophila stock
- 6. Monohybrid and dihybrid ratio in Drosophila
- 7. Monohybrid and dihybrid ratio in Maize
- 8. Problems on co-dominance, epistasis, two point and three point test cross, gene mapping, Tetrad analysis
- 9. Statistical applications of t-test
- 10. Statistical applications chi square test
- 11. Statistical applications of Hardy-Weinberg Equilibrium

REFERENCE BOOKS

- 1. Cell & Molecular Biology. E.D.D De Robertis & E.M.F De Robertis, Waverly publication
- 2. An introduction to Genetic Analysis by Anthony, J.F. J.A. Miller, D.T. Suzuki, R.C. Richard Lewontin, W.M-Gilbert, W.H. Freeman publication
- 3. Principles of Genetics by E.J.Gardner and D.P. Snusted. John Wiley & Sons, New York
- 4. The science of Genetics, by A.G. Atherly J.R. Girton, J.F. Mcdonald, Saundern College publication
- 5. Principles of Genetics by R.H. Tamarin McGrawhill
- 6. Theory & problems in Genetics by Stansfield, Schaum out line series McGrawhill
- 7. Molecular Cell Biology Lodish, H., Baltimore, D; fesk, A., Zipursky S.L., Matsudaride, P. and Darnel. American Scientific Books. W.H. Freeman, New York
- 8. The cell: A molecular approach. Geoffrey M Cooper, Robert E Hausman, ASM press
- 9. Cell and Molecular Biology, Concepts and Experiments – Gerald Karp, John Wiley & Sons, Inc

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NAGARJUNA GOVERNMENT COLLEGE
AUTONOMOUS
B.Sc (CBCS) Biotechnology- I year
SEMESTER-I
PAPER-I
CELL BIOLOGY AND GENETICS

Max. Marks: 70

SECTION-A

I. ANSWER THE FOLLOWING QUESTIONS

5x2 =10M

- 1.Mitochondria
- 2.Downs syndrome
3. X- inactivation
- 4.Apoptosome
- 5.Haemophilia

SECTION-B

II.ANSWER ANY FOUR OF THE FOLLOWING QUESTIONS

4X5=20M

- 6.Explain cell membrane models: Fluidmosaic, Sandwich, unit membrane model?
- 7.write about the Cell Cycle and its control?
- 8 .Explain about chromosomal structural and numerical aberrations?
- 9.what is Linkage? Explain phases of Linkage with examples?
10. Explain about Hardyweineberg equilibrium, allelic, genotype distribution ?
11. Explain about X-linked inheritance?

SECTION- C

III.ANSWER THE FOLLOWING QUESTIONS

4 X 10 = 40M

12. a). Write in detail about ultrastructure of Prokaryotic cell?
OR

b.) Explain briefly about Eukaryotic chromosome organization?

13 a.) Add a note on meiosis and its significance?

OR

b.) Explain the events involved in apoptosis (cell death) ?

14. a). Write briefly about Multiple allelism with examples ?

OR

b.) Explain about Sex determination in Humans, Birds, Drosophila, Bonellia?

15. a.) Explain Non mendelian inheritance –maternal effect Shell Coiling in Snail?

OR

b.). Add a note on Mitochondrial inheritance –in Human & poky in Neurospora crassa?

Annao

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NAGARJUNA GOVERNMENT COLLEGE, NALGONDA
(AUTONOMOUS) B.Sc- I Biotechnology
NUCLEIC ACIDS & BIOINFORMATICS(CBCS)

SEMESTER-I
CORE THEORY II

MODULE-I : Nucleic Acids and Genome organization

60 hrs

1.1 DNA as the genetic material- Griffiths experiments on transformation in *St pneumoniae*, Hershey-Chase experiments with radio labeled T2 bacteriophage, Avery, MacLeod and McCarty's experiments

1.2 RNA as genetic material- Tobacco Mosaic Virus

1.3 Structure and forms of DNA (A, B and Z)

1.4 Genome organization in prokaryotes

1.5 Genome organization in eukaryotes, C-value and C-value paradox, Reassociation kinetics-cot curve, Denaturation, Renaturation, T_m curve

1.6 Kinetic classes of DNA- unique sequences, moderately repeated and highly repeated sequences; tandem repeats (satellite, minisatellite and micro satellites), interspersed repeats (SINES-eg: Alu repeats, LINES); palindromic sequences and transposable genetic elements

MODULE-II: DNA Replication, Recombination and Repair

2.1 DNA replication- enzymes involved, semi conservative DNA replication-Messelson and Stahl experiment, Linear, Circular, Rolling circle, Theta, D loop

2.2 Mutation- spontaneous, induced (frame shift, transition, transversion)

2.3 Physical and chemical mutagens

2.4 DNA damage- intrinsic and extrinsic factors

2.5 DNA repair-Direct, Excision and methyl mediated mismatch, recombinational and SOS repair

2.6 DNA recombination-homologous, site specific recombination and NHEJ (Non-Homologous End Joining)

MODULE-III: Concepts of Bioinformatics

3.1 Bioinformatics – a historical perspective

3.2 Internet and its role in bioinformatics

3.3 Bioinformatics Data: Genomes, nucleic acids, proteins, protein structures

3.4 Storage of databases in DNA (GenBank, EMBL, DDBJ)

3.5 Protein data banks (PDB, SWISS-PROT, UNIPROT, PIR) and their utilization

3.6 Data retrieval tools-BLAST, ENTREZ

MODULE-IV: Applications of Bioinformatics

4.1 Genome annotation: Gene identification tools

4.2 Basics of sequence alignment, Pairwise alignment (global and local)

4.3 Multiple sequence alignment and phylogenetic analysis

4.4 Structural classification of proteins and homology model building

4.5 Applications of Bioinformatics- drug targets, overview of drug designing

4.6 Concepts of Pharmacogenomics

CORE-II: PRACTICALS

1. Isolation of DNA from Plant cells
2. Isolation of DNA from Animal cells
3. Estimation of DNA by Diphenylamine method
4. Estimation of RNA by Orcinol method
5. Exploring data bases: Genbank and Uniprot
6. Exploring the structural data bases: PDB, MMDB
7. Visualization of Protein structures-RASMOL
8. Database searching and downloading bioinformatics data- DNA (Gen bank, DDBJ, ENA) Protein (Uniprot)
9. Pairwise sequence alignment (global and local) of DNA and proteins
10. Multiple sequence alignment of DNA & protein sequences using ClustalW
11. Database searching with heuristic algorithms: BLAST

REFERENCE BOOKS

1. Genes VII. Benjamin Lewin, Oxford Univ. Press, Oxford
2. Molecular Biology by D, Freifelder Narosa Publishing house New York, Delhi
3. Molecular Cell Biology Lodish, H., Baltimore, D; fesk, A., Zipursky S.L., Matsudaride, P. and Darnel. American Scientific Books. W.H. Freeman, NewYork
4. Molecular Biology by Brown
5. Essentials of Molecular Biology. D. Freifelder, Panima Publishing Corporation.
6. Bioinformatics: Sequence and Genome Analysis by David W. Mount, Cold Spring Harbor Laboratory Press
7. Biological Sequence Analysis: Probabilistic Models of Proteins and Nucleic Acids by Richard Durbin, Sean R. Eddy, Anders Krogh, Graeme Mitchison, Cambridge University Press
8. Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins, Andreas D. Baxevanis, B. F. Francis Ouellette, Wiley-Interscience
9. Bioinformatics tools and Resources – free online tools, downloadable free tools, software packages, internet, Bioinformatics books and Journals, Bioinformatics web-portals

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NAGARJUNA GOVERNMENT COLLEGE AUTONOMOUS

MODEL QUESTION PAPER

I YEAR - NUCLEIC ACIDS AND
BIOINFORMATICS(CBCS)SEMISTER-II PAPER-II

SECTION-A

MARKS:70

1. ANSWER THE FOLLOWING QUESTIONS

5 X 2 = 10M

- 1.C-value
- 2.B- DNA
- 3.BLAST
- 4.Photoreactivation
5. LINES

SECTION-B

II.ANSWER ANY FOUR OF THE FOLLOWING QUESTIONS

4X5=20M

- 6.Explain kinetic classes of DNA?
- 7.Write about -homologous, site specific DNA recombination ?
- 8.Explain the storage of Databases in DNA databanks ?
- 9.Add a note on Multiple sequence alignment ?
- 10.Explain structural classification of proteins ?
11. write different Structures and forms of DNA?

SECTION -C

III.ANSWER THE FOLLOWING QUESTIONS

4 X 10 = 40 M

12a).Explain Genome organization in Eukaryotes?

Or

b.)Write briefly about the Hershey and chase Experiments with radio labeled T2bacteriophage?

13.a.)Write about the Enzymes involved in DNA replication?

Or

b.)Describe briefly about Mutations spontaneous and induced type?

14.a.)Write briefly about protein databases& their utilization in databanks?

Or

b.)Explain briefly about Phylogenetic analysis and its importance?

15.a.)Write about the drug designing and its targets?

Or

b.)Add a note on concepts of Pharmacogenomics?

AM Rao

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NAGARJUNA GOVERNMENT COLLEGE, NALGONDA
(AUTONOMOUS)

B.Sc-II Biotechnology
BIOLOGICAL CHEMISTRY(CBCS)

SEMESTER-III

PAPER-III

60hr
4hr/week

MODULE-I CARBOHYDRATES

1. Carbohydrates: Importance, classification
2. Structure and configuration of Monosaccharides, monosaccharides: structure, classification and properties
3. Disaccharides- structures of sucrose, lactose, maltose and trehalose glycosidic linkage and sugars as reducing agents.
4. Polysaccharides- storage polysaccharides – starch and glycogen; structural polysaccharides- cellulose and chitin

MODULE-II CARBOHYDRATES-METABOLISMS

1. Glycolysis
2. Citric acid cycle
3. Gluconeogenesis and its significance
4. Mitochondrial electron transport, chemiosmotic theory of ATP synthesis
5. Photosynthesis- Light and dark reaction

MODULE-III PROTEINS & AMINO ACID-METABOLISM

1. Proteins: classification and structural features of amino acids
2. Stereoisomerism and Zwitter ion properties alloforms of amino acids
3. Peptide bond characteristics, structure and classification
different levels of structures of proteins-primary, secondary, tertiary and quaternary
4. Deamination, decarboxylation and transamination reactions of amino acids.
5. Inborn errors in amino acid catabolisms – phenyl alanine and tyrosine (phenylketonuria and albinism)
6. urea cycle

MODULE-IV LIPID- METABOLISM

1. Lipids: Fatty acids: Saturated and unsaturated
2. Classification of lipids- Saponifiable and non-saponifiable Triacylglycerols, Phosphoglycerols, Spingolipids, Sterols, Lipid bilayer membranes
3. B-Oxidation of fatty acid- Knoop's theory

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Practicals

1. Qualitative tests of sugars.
2. Qualitative tests of amino acids.
3. Qualitative tests of lipids.
4. Quantitative estimations of protein by Biuret Methods
5. Estimation of total sugars by Amino acids

NAGARJUNA GOVERNMENT COLLEGE AUTONOMOUS
MODEL QUESTION PAPER
BIOCHEMISTRY II YEAR

SEMESTER-III
PAPER-III

MARKS: 70

I. ANSWER THE FOLLOWING QUESTIONS

5X2=10

1. Trehalose?
2. Chemiosmotic theory?
3. Zwitter ion?
4. Spingolipids?
5. Deamination?

SECTION-B

II. ANSWER ANY FOUR OF THE FOLLOWING QUESTIONS

4X5=20

6. Write detailed structure of Disaccharides ?
7. Explain briefly about Gluconeogenesis and its significance.?
8. Explain different levels of structures of proteins.?
9. Write about classifications of lipids.?
10. Write about inborn errors in amino acids catabolisms.?
11. Write about Z scheme Photosynthesis reaction

SECTION -C

III. ANSWER THE FOLLOWING QUESTIONS

4X10=40

- 12 a.) Write the Carbohydrate classification and importance?
Or
b.) Write about structure and configuration of monosaccharides and its properties?
13. a.) Describe electron transport chain in mitochondria?
Or
b.) Explain briefly about Glycolysis and its significance?
14. a.) Write the classification and structural features of amino acids?
Or
b.) Write about Physico chemical properties of amino acids?
- 15 a.) Write about β -oxidation of fatty acids ?
Or
b.) Write about saturated and unsaturated fatty acids ?

Aruna

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**NAGARJUNA GOVERNMENT COLLEGE, NALGONDA
(AUTONOMOUS)**

B.Sc-II Biotechnology

ENZYMOLGY-BIOPHYSICAL TECHNIQUES(CBCS)

SEMESTER-IV

60 hrs

(4 hrs/ week)

PAPER- IV

MODULE-I ENZYMOLOGY

1. Enzymes: Classification of enzymes
2. Kinetics of enzyme catalyzed reactions
3. Factors influencing enzymatic reactions
 - a) PH
 - b) Temperature
 - c) Substrate concentration
 - d) Enzyme concentration
4. Enzyme inhibition- competitive and non competitive

MODULE -II BIO PHYSICAL TECHNIQUES

1. Colorimetry and Spectrophotometry-Beer-Lambert's Law
2. Microscopy-Light, Inverted, Fluorescent and Electron microscopy
3. Chromatography
 - a) Paper
 - b) Thin Layer
 - c) Ion-exchange
 - d) Gel-filtration
4. Electrophoresis – Paper, Agarose, SDS-PAGE
5. Centrifugation, Dialysis, Cell fractionation, distraction.

MODULE -III FUNDAMENTALS OF MICROBIOLOGY

- 3.1 Outlines of classification of microorganisms
- 3.2 Structure and general characters of Viruses, Bacteria, Fungi and MicroAlgae (one example from each group)
- 3.3 Disease causing pathogens and their symptoms (examples; Typhoid, HIV only Isolation, identification and preservation of microorganisms (Bacteria)

MODULE -IV FUNDAMENTALS OF MICROBIOLOGY

- 3.5 Identification methods of Fungi and useful Micro Algae
- 3.6 Methods of sterilization
- 3.7 Bacterial reproduction and growth kinetics (Batch and continuous Culture). Pure cultures and cultural characteristics

Annad

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Practicals

1. Paper chromatography of amino acids
2. Separation of compounds by TLC
3. Separation of plant pigments on alumina column/paper chromatography
4. Paper electrophoresis of amino acids
5. Enzyme assays- Catalase (any other enzyme)
6. Preparation of routine microbiological media.
7. Isolation of common non-pathogenic bacteria
8. Staining and identification of bacteria -- E.coli, Pseudomonas, Bacillus and Staphylococcus

**NAGARJUNA GOVERNMENT COLLEGE AUTONOMOUS
MODEL QUESTION PAPER**

ENZYMOLGY & BIOPHYSICAL TECHNIQUES

II YEAR – SEMESTER-IV

PAPER-IV

MARKS: 70

SECTION-A

I. ANSWER THE FOLLOWING QUESTIONS

5X2=10

1. Competitive inhibition.
2. Inverted Microscope.
3. TEM.
4. Microalgae.
5. Hot air Oven.

SECTION-B

II. ANSWER ANY FOUR OF THE FOLLOWING QUESTIONS

4X5=20

6. Write about the types of enzyme inhibitions.
7. Briefly describe the Thinlayer chromatography.
8. Write about the Fluorescent Microscopy.
9. Describe the Typhoid causing pathogen and the symptoms.
10. Write about Pure cultures and their cultural characteristics.
11. Write the methods of sterilization.

SECTION –C

III. ANSWER THE FOLLOWING QUESTIONS

4X10=40

1. a.) Explain details of enzyme classifications.

Or

- b.) Write the factors influencing enzymatic reactions.

2. a.) What is Beer-Lambert's law – Explain

Or

- b.) Write the principle and procedure of electrophoresis with example.

3. a.) Write the structure and characters of different Microorganisms

Or

- b.) Disease causing pathogens and their symptoms – Typhoid

15. a.) Write different methods of Sterilizations.

Or

- b.) Write about the Bacterial growth .

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NAGARJUNA GOVT. DEGREE COLLEGE, NALGONDA 508001

B.Sc -III-Biotechnology

MOLECULAR BIOLOGY(CBCS)(CORE)

SEMESTER-V

**60 hrs
3 hrs/ week)**

PAPER- V

MODULE-I Gene nature and concept

- 1.1 Organization of nuclear genome – Genes and gene numbers – essential and non essential genes
- 1.2 Denaturation and renaturation of DNA - T_m values and Cot curves
- 1.3 Kinetic classes of DNA - Single copy sequences, and repeated sequences. Inverted, tandem and palindromic repeats
- 1.4 Satellite DNA

MODULE- II Genome organization

- 1.5 Mitochondrial genome organization (eg: Human)
- 1.6 Chloroplast genome organization in plants
- 1.7 Organization of eukaryotic genes - Exons, introns, promoters and terminators
- 1.8 Gene families and clusters – eg. Globin gene, histones and ribosomal genes.

MODULE-III Gene expression®ulation

- 2.1. Prokaryotic and Eukaryotic Transcription
Post-transcriptional modifications (Capping, polyadenylation, splicing and alternate splicing)
- 2.2 Translation, Genetic code and its features, Wobble Hypothesis, Synthesis of polypeptides - initiation, elongation and termination in prokaryotes and eukaryotes
- 2.3 Regulation of gene expression in prokaryotes and eukaryotes
Operon concept in bacteria – Lac operon, Tryptophan Operon, Mating types in yeasts

MODULE-IV Cancer Biology

- 2.4 Cancer-Types of Cancer
- 2.5 Characteristics of cancer cells
- 2.6 Oncogenes
- 2.7 Tumour Suppressor Genes

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Practicals

1. Isolation of DNA from plant/animal/bacterial cells
2. Analysis of DNA by Agarose gel electrophoresis
3. Restriction digestion of DNA
4. Estimation of Melting temperature of DNA

Recommended Books

1. Concepts in Biotechnology - By D. Balasubramanian, C.F.A. Bryce, K. Dharmalingam, J. Green and Kunthala Jayaraman
2. Essential Immunology - By I. Roitt, Publ: Blackwell
3. Molecular Biology of the Gene - By Watson, Hopkins, Goberts, Steitz and Weiner (Pearson Education)
4. Cell and Molecular Biology - By Robertis & Robertis, Publ: Waverly
5. Text Book of Biotechnology - By H.K. Das (Wiley Publications)
6. Gene Structure & Expression - By J.D. Howkins, Publ: Cambridge
7. Test Book of Molecular Biology - By K.S. Sastry, G. Padmanabhan & C. Subramanyan, Publ: Macmillan India
8. Microbial Genetics - By S.R. Maloy, J.E. Cronan & D. Freifelder, Publ: Jones & Barlett
9. Principles of Gene Manipulation - By R.W. Old & S.B. Primrose, Publ: Blackwell
10. Genes - By B. Lewin - Oxford Univ. Press
10. Molecular Biology & Biotechnol. - By H.D. Kumar, Publ: Vikas
11. Essentials of Biotechnology - By P.K. Gupta
12. Laboratory Experiments in Microbiology - By M. Gopal Reddy, M.N. Reddy, D.V.R. Sai

NAGARJUNA GOVERNMENT COLLEGE
AUTONOMOUS
MODEL QUESTION PAPER
III YEAR –SEMESTER-V PAPER-V
(CORE)MOLECULAR BIOLOGY
SECTION-A

MARKS: 70
5X2=10

I.ANSWER THE FOLLOWING QUESTIONS

1. C-value paradox
2. Tm-curve
3. Palindromic repeats
4. TATA box
5. Promoters

SECTION-B

II.ANSWER ANY FOUR OF THE FOLLOWING QUESTIONS

4X5=20

6. Write the re-association kinetics of DNA detail.
7. Write about kinetic classes of DNA.
8. Mitochondrial genome organization in human.
9. Write an account on Post-transcriptional modifications.
10. Give an account on Operon concept of Lac gene.
11. Write the characteristics of Cancer cells

SECTION –C

III.ANSWER THE FOLLOWING QUESTIONS

4X10=40

12. a.) Describe the Nuclear Genome of eukaryotic and Prokaryotic cells?
Or
b.) Write the salient features of satellite DNA ?
13. a.) Write in detail about Chloroplast genome Organisation?
Or
b.) Define gene families and clusters with one example?
14. a.) Describe the Translation process in Eukaryotes?
Or
b.) Write in detail about the transcription of Eukaryotes?
Or
15. a.) Define cancer and types of cancers?
Or
b.) Write in detail about oncogenes?

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NAGARJUNA GOVT. DEGREE COLLEGE, NALGONDA 508001

B.Sc III-Biotechnology_PAPER- VI

GENETIC ENGINEERING&IMMUNOLOGY(CBCS)(Advanced Elective-I)

60 hrs
(3 hrs/ week)

MODULE- I Recombinant DNA Technology

- 3.1 Enzymes used in gene cloning : Restriction endonucleases, Ligases, Phosphatases, Methylases, Kinases
- 3.2. Cloning vehicles – Plasmids, Cosmids, Phage vectors, Shuttle vectors,
- 3.3. Baculovirus vector system.
- 3.4. Construction of genomic and cDNA libraries

MODULE- II Applications in rDNA Technology

- 3.5. Identification of cloned genes
- 3.6. Application in genetic engineering –HUMILLIN, SOMTOSTATIN,GOLDEN RICE with Vitamin A
- 3.7 Recombinant vaccines productions

MODULE- III Basics of Immunology

- 2.1 Introduction to immune system – Organs and cells of the immune system
- 2.2 Antigens, Haptens – physico-chemical characteristics
- 2.3 Structure of different immunoglobulins and their functions – Primary and secondary antibody responses,Antigen - Antibody Reaction,Generation of antibody diversity
- 2.4 The Major Histocompatibility gene complex and its role in organ transplantation.
- 2.5 Hypersensitivity – Coombs classification, Types of hypersensitivity,Autoimmune diseases – mechanisms of auto immunity

MODULE- IV Virology

1. Structure and composition of viruses.
2. One-step growth and determination of plaque forming units (PFU).
3. Isolation and cultivation of bacterial plaques. Lytic and lysogenic life cycle of λ -phage.
4. TMV, Retro viruses- HIV.
Prions and Mycoplasma

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Practicals

1. Immuno-diffusion test
2. ELISA Test
3. Microagglutination using microtiter plates (eg. ABO and Rh Blood grouping)
4. Viability tests of cells/bacteria (Evans blue test or Trypan blue test)
5. Coomb's test

Recommended Books

1. Genetic Engineering - By R. Williamson, Publ: Academic Press
2. Test Book of Molecular Biology - By K.S. Sastry, G. Padmanabhan & C. Subramanyan, Publ: Macmillan India
3. Microbial Genetics - By S.R. Maloy, J.E. Cronan & D. Freifelder, Publ: Jones & Barlett
4. Principles of Gene Manipulation - By R.W. Old & S.B. Primrose, Publ: Blackwell
5. Genes - By B. Lewin - Oxford Univ. Press
6. Molecular Biology & Biotechnol. - By H.D. Kumar, Publ: Vikas
7. Immunology - By G. Reeve & I. Todd, Publ: Blackwell
8. From Genes to Clones - By E.L. Winnacker, Publ: Panima, New Delhi
9. Methods for General & Molecular Bacteriology - By P. Gerhardt et al., Publ: ASM
10. Molecular Biotechnology - By G.R. Click and J.J. Pasternak, Publ: Panima
11. Recombinant DNA - By J.D. Watson et al., Publ: Scikentific American Books
12. Immuno diagnostics - By S.C. Rastogi, Publ: New Age
13. Molecular Biology - By D. Freifelder, Publ: Narosa
14. Genes and Genomes - By Maxine Singer and Paul Berg
15. Cell and Molecular Biology - By S.C. Rastogi
16. Genetic Engineering and Biotechnology - By V. Kumar Gera
17. Essentials of Biotechnology - By P.K. Gupta
18. Immunology - By Kubey
19. Gene Biotechnology - By Jogdand
20. Genome - T.A. Brown
21. Gene Cloning - T.A. Brown

NAGARJUNA GOVERNMENT COLLEGE(AUTONOMOUS)

GENETIC ENGINEERING&IMMUNOLOGY(CBCS)(Advanced Elective-I)

MODEL QUESTION PAPER -PAPER- VI

III YEAR (ADVANCED ELECTIVE-I)

TIME 2.30 hrs

MARKS: 70

SECTION-A

I.ANSWER THE FOLLOWING QUESTIONS

5X2=10

- 1.Methylase
- 2.PBR322
- 3.Southern blotting
- 4.Golden rice
- 5.Thymus

SECTION-B

II.ANSWER ANY FOUR OF THE FOLLOWING QUESTIONS

4X5=20

- 1.Palindromic sequences
- 2.Somatostatin
- 3.Hapten
- 4.MHC Complexes
- 5.Rheumatoid Arthritis
- 6.Prions & Mycoplasma

SECTION -C

III.ANSWER THE FOLLOWING QUESTIONS

4X10=40

- 1 s.a.)Write the role of restriction endonuclease enzyme in gene cloning?
Or
b.)Write the brief an account on construction of recombinant DNA.?
2. a.) Explain about the Recombinant vaccines and its production?
Or
b.) Applications of rDNA technology in Genetic engineering?
- 3.a.)Write the physico-chemical properties of Antigens?
Or
b.)What is Hypersensitivity-Explain its type with examples ?
- 4.a.)Explain Isolation and cultivation of plaques?
Or
b.)what is Retro virus?Explain HIV replication with neat diagram?

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**NAGARJUNA GOVERNMENT COLLEGE, NALGONDA
(AUTONOMOUS)**

B.Sc III-Biotechnology_PAPER- VI

(ADVANCED ELECTIVE-II) ENVIRONMENTAL BIOTECHNOLOGY:

**60hr
(3hrs/ week)**

Unit I: Biological Treatment of Wastewater – Aerobic System

Biological processes for domestic and industrial waste water treatments; Aerobic systems - activated sludge process, trickling filters, biological filters, rotating biological contractors (RBC), Fluidized bed reactor (FBR), expanded bed reactor, Inverse fluidized bed biofilm reactor (IFBBR) packed bed reactors air- sparged reactors, Biological Treatment of Wastewater – Anaerobic System

Unit II: Bioremediation

Introduction, constraints and priorities of Bioremediation, Biostimulation of Naturally occurring microbial activities, Bioaugmentation, in situ, ex situ, intrinsic & engineered bioremediation, Solid phase bioremediation - land farming, prepared beds, soil piles, Phytoremediation

Unit III: Metal Biotechnology

Mining and Metal biotechnology – with special reference to Copper & Iron. Microbial transformation, accumulation and concentration of metals, metal leaching, extraction and future prospects.

Bio Fuels

Microorganisms and energy requirements of mankind; Production of nonconventional fuels - Methane (Biogas), Hydrogen, Alcohols and algal hydrocarbons,

Use of microorganisms in augmentation of petroleum recovery.

Unit IV: Hazardous Waste Management- I

Introduction - Xenobiotic compounds, recalcitrance. hazardous wastes - biodegradation of Xenobiotics . Biological detoxification - market for hazardous waste management –

Hazardous Waste Management- II

biotechnology application to hazardous waste management - examples of biotechnological applications to hazardous waste management - cyanide detoxification - detoxification of oxalate, urea etc. - toxic organics - phenols.

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TEXT BOOKS:

1. Environmental Biotechnology by S. K. Agarwal
2. Biodegradation & Bioremediation (1999), Martin Alexander, Academic press.

REFERENCES:

1. Stanier R. Y., Ingram J.L., Wheelis M.L., Painter R.R., General Microbiology, McMillan Publications, 1989.
2. Foster C.F., John Ware D.A., Environmental Biotechnology, Ellis Horwood Ltd., 1987.
3. Karrely D., Chakrabarty K., Omen G.S., Biotechnology and Biodegradation, Advances in Applied Biotechnology Series, Vol.4, Gulf Publications Co. London, 1989.
4. Bioremediation engineering; design and application 1995 John. T. cookson, Jr. Mc Graw Hill, Inc.
5. Environmental Biotechnology by A.K. Chatterjee
6. Environmental Biotechnology by S.N.Jogdand Himalaya Publishing

NAGARJUNA GOVERNMENT COLLEGE(AUTONOMOUS)

MODEL QUESTION PAPER
B.Sc III-Biotechnology PAPER- VI
III YEAR

(ADVANCED ELECTIVE-II) ENVIRONMENTAL BIOTECHNOLOGY

TIME 2.30 hrs

SECTION-A

I. ANSWER THE FOLLOWING QUESTIONS

MARKS: 70

5X2=10

1. Waste water Treatment.
2. Fluidised bed reactor
3. Palindromic repeats
4. Bioaugmentation
5. Metal leaching

SECTION-B

II. ANSWER ANY FOUR OF THE FOLLOWING QUESTIONS

4X5=20

6. Write in detail about the waste water treatment in aerobic system.
7. Write about Bioremediation.
8. Describe the process of mining and extraction of iron
9. write the petroleum recovery methods.
10. what are biofuels and their importance.
11. write the anerobic system of waste water treatment.

SECTION -C

III. ANSWER THE FOLLOWING QUESTIONS

4X10=40

12.a.) Describe the process of domestic and waste water treatment?

Or

b.) Write the Biological Treatment of Wastewater – Anaerobic System?

13.a.) Write in detail about constraints and priorities of Bioremediation?

Or

b.) Define Solid phase bioremediation and its procedures?

14.a.) Describe the Mining of copper?

Or

b.) write in detail about Microorganisms and energy requirements of mankind fuels – Methane (Biogas)?

Or

15.a.) Define Biological detoxification and its methods?

b.) Write in detail about detoxification of oxalate, urea?

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NAGARJUNA GOVERNMENT COLLEGE, NALGONDA
(AUTONOMOUS)

B.Sc-III Biotechnology
ANIMAL AND PLANT BIOTECHNOLOGY(CORE)
SEMESTER VI-PAPER-VII

60hr
(3 hrs/ week)

MODULE-I Animal Tissue culture

- 1.1 Introduction to animal biotechnology
- 1.2 Principles of animal cell culture – culture vessels
- 1.3 Cell culture media preparation, sterilization, types of cultures
- 1.4 Establishment and preservation of cell lines
- 1.5 Explants and cell disaggregation
- 1.6 Culture of cells and tissues (including Stem cells and their application)

MODULE- II Animal Biotechnology Techniques

- 1.7 *In vitro* fertilization and embryo transfer technology
- 1.8 Methods of gene transfer – Microinjection and viral mediated gene transfer techniques
Production of transgenic animals and molecular pharming
- 1.9 Principles of *Ex vivo* and *In vivo* gene therapy

MODULE- III Plant Tissue culture

- 2.1. Composition of media (Murashige and Skoog's and Gamborg's only)
Preparation of media and methods of sterilizations
- 2.2. Role of plant growth regulators in differentiation
- 2.3. Induction of callus
- 2.4. Meristem culture and production of virus free plants
Clonal propagation of plants on a commercial scale (Somatic embryogenesis and organogenesis)

MODULE- IV Plant Biotechnology and Applications

- 2.5. Mass cultivation of cell cultures and process engineering – batch and continuous cultures, Bioreactors
- 2.6. Production of commercially useful compounds by plant cell culture
(Shikonin, alkaloids, food additives)
- 2.6 Biotransformation by plant cell cultures (Digitoxin, Beeta methyl digitoxin)
- 2.7. Methods of gene transfer techniques (*Agrobacterium*, Microprojectile bombardment)
- 2.8. Applications of recombinant DNA technology in agriculture
- 2.9. Production of therapeutic proteins from transgenic plants

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Practicals

1. Preparation of media, and initiation of callus from any one selected plant species
2. Micropropagation of plants (any one)
3. Preparation of synthetic seeds
4. Preparation of media and culture of animal cells/tissues
5. Cell disaggregation and cell counting

Recommended Books

1. Strategies in Transgenic Animal Sciences - By Glenn M.M. and James M. Robl ASM Press 2000.
2. Practical Biotechnology – Methods and Protocols - By S. Janarthanan and S. Vincent (Universities Press)
3. Animal Cells as Bioreactors - By Terence Gartoright, Cambridge Univ Press
4. Molecular Biotechnology - By Chinnarayappa (Universities Press)
5. Principles and Practice of Animal Tissue Culture - By Sudha Gangal (Universities Press)
6. Introduction to Veterinary Genetics - By F.W. Nicholas, Oxford University Press.
7. Text Book of Biotechnology - By H.K. Das (Wiley Publications)
8. Biotechnology -By H.J. Rehm and G. Reed Vol-1-86 VCH Publications, Germany
9. Guide for the care and use of lab animals National Academy Press.
10. Biogas Technology - By b.T. Nijaguna
11. Biotechnology – I - By R.S. Setty and G.R. Veena
12. Biotechnology – II - By R.S. Setty and V. Sreekrishna
13. Introduction to Plant Tissue Culture - By M.K. Razdan (Oxford and IBH Publishing Company, New Delhi)
14. Introduction to Plant Biotechnology - By H.S. Chawla (Oxford and IBH Publishing Comp., New Delhi)
- Biotechnology - By K. Trehan
15. Introduction to Biotechnology - By P.K. Gupta
16. Frontiers of Plant Tissue Culture - By T.A. Thorpe
17. Plant Tissue Culture – Theory and Practice - By S.S. Bhojwani and M.K. Razdan
18. Biotechnology – By U. Satyanarayana

**NAGARJUNA GOVERNMENT COLLEGE
AUTONOMOUS
MODEL QUESTION PAPER
ANIMAL AND PLANT BIOTECHNOLOGY(CORE)
III YEAR –SEMISTER-VI PAPER-VII**

TIME 2.30 hrs

MARKS: 70

SECTION-A

I.ANSWER THE FOLLOWING QUESTIONS

5X2=10

- 1 .RPMI 1640 MEDIA
2. ICSI treatment
3. Auxins
4. Ti plasmid
- 5.Somatic embryogenesis

SECTION-B

II.ANSWER ANY FOUR OF THE FOLLOWING QUESTIONS

4X5=20

1. write the method of primary cell culturing ?
2. write about the establishment of animal cell lines?
3. write about the method of viral mediated gene transfer in animals?
4. Explain clonal propagation(Somatic and Organogenesis)?
5. write the Role of PGRS in plant growth?
6. Explain Mass cultivation of bioreactor?

SECTION –C

III.ANSWER THE FOLLOWING QUESTIONS

4X10=40

1a)Write briefly about preparation of animal cell culture media and Sterilization?

Or

b).Give an account on stem cells and their applications.

2a).Write a brief account on In vitro fertilization(IVF).

Or

b)Explain about the Ex vivo and In vivo gene therapy with examples?

3a)Write the Ingredients in MS MEDIA and its sterilization?

Or

b.)Production of virus free plants in commercial scale.

4a.)write an account on applications of rDNA technology in agriculture?

Or

b.)Write an account on Agrobacterium mediated gene transfer in plants.

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**NAGARJUNA GOVERNMENT COLLEGE, NALGONDA
(AUTONOMOUS)**

B.Sc- III Biotechnology

INDUSTRIAL AND ENVIRONMENTAL BIOTECHNOLOGY (APPLIED ELECTIVE-I)

III YEAR – SEMISTER-VI PAPER-VIII

60 hrs
(3 hrs/ week)

MODULE- I Industrial Biotechnology I

- 3.1 Introduction to industrial biotechnology.
- 3.2 Primary and secondary metabolic products of microorganisms
- 3.3 Screening and isolation and preservation of industrial microorganisms
- 3.4 Principles of Fermentation technology
- 3.5 Commercial production of fuels and chemicals by microbial fermentations

MODULE- II Industrial Biotechnology II

- 3.6 Fermentative production of microbial enzymes (amylases, proteases), and antibiotics
- 3.7 Fermentative production of foods and dairy products
- 3.8 Animal cells as bioreactors; characteristics of bioreactors, expression and over production of targeted proteins – human growth hormones – production of α and β - interferons, monoclonal antibodies
- 3.9 Good manufacturing practices, Biosafety issues, Bioethics
- 3.10 Intellectual Property Rights and Patenting issues


MODULE- III Environmental Biotechnology I


- 4.1 Introduction to environmental biotechnology
- 4.2 Renewable and non-renewable energy resources
- 4.3 Conventional energy sources and their impact on environmental
- 4.4 Non-conventional fuels and their impact on environment (biogas, bioethanol, microbial hydrogen production)
- 4.5 Microbiological quality of milk, food and water

MODULE- IV Environmental Biotechnology II

- 4.6 Microbiological treatment of municipal and industrial effluents
- 4.7 Microbial degradation of pesticides and toxic chemicals
- 4.8 Biopesticides and Biofertilizers (Nitrogen fixing, phosphate solubilizing microorganisms)
- 4.9 Microbial ore leaching, Introduction to Bioremediation
- 4.10 Molecular Techniques: 1. Basic P.C.R.-modifications of PCR
2. Blotting Techniques (southern ,northern & western)3. DNA fingerprinting

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Practicals

1. Production of wine using common yeast
2. Production of hydrogen or biogas using cow/cattle dung
3. Isolation of microbes from soil or industrial effluents
4. Estimation of BOD in water samples
5. Production of alcohol by fermentation and Estimation of alcohol by colorimetry
6. Production of biofertilizers (*Azolla*)
7. Growth curves of bacteria, Measurement of growth in liquid cultures
8. Quality testing of milk by MBRT

Recommended Books

- | | | |
|-----|--------------------------------|--------------------------------------|
| 19. | Biotechnology | - By K. Trehan |
| 20. | Industrial Microbiology | - By L.E. Casida |
| 21. | Food Microbiology | - By M.R. Adams and M.O. Moss |
| 22. | Introduction to Biotechnology | - By P.K. Gupta |
| | Bioprocess Engineering | - By Shuler (Pearson Education) |
| 23. | Biotechnology – I | - By R.S. Setty and G.R. Veena |
| 24. | Biotechnology – II | - By R.S. Setty and V. Sreekrishna |
| 22. | Bioethics – Readings and Cases | - By B.A. Brody and H. T. Engelhardt |

NAGARJUNA GOVERNMENT COLLEGE
MODEL QUESTION PAPER
INDUSTRIAL BIOTECHNOLOGY (APPLIED ELECTIVE -I)
III YEAR -SEMISTER-VI PAPER-VIII

TIME 2.30 hrs

MARKS: 70

SECTION-A

I. ANSWER THE FOLLOWING QUESTIONS

5X2=10

1. Amylase
2. Biofertilizers
3. Solar energy converters
4. Chemical sterilizers
5. Biogas

SECTION-B

II. ANSWER ANY FOUR OF THE FOLLOWING QUESTIONS

4X5=20

1. Give in detail about the commercial production of ethanol?
2. Write the principles of Fermentation technology?
3. Give the characteristics of Bioreactors?
4. Explain some of the Biosafety methods in laboratories?
5. Factors involved in food quality explain?
6. Write the Principle involved in PCR?

SECTION -C

III. ANSWER THE FOLLOWING QUESTIONS

4X10=40

- 1 a.) Write about Primary and secondary metabolic products of microorganisms.
Or
b.) Explain briefly about screening and isolations of industrial microorganisms.
2. a.) Give an account of fermentative productions of foods and dairy products
Or
b.) Give brief an account on production of interferons and monoclonal antibodies
3. a.) Write about Renewable and Non renewable energy resources.
Or
b.) Write about Non-conventional fuels and their impact on environment.
4. a.) Explain Microbial degradation of pesticides and toxic chemicals .
Or
b.) Write the different methods of Blotting techniques

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NAGARJUNA GOVERNMENT COLLEGE, NALGONDA
(AUTONOMOUS)
FOOD SCIENCE & TECHNOLOGY (APPLIED ELECTIVE-II)
III YEAR – SEMESTER-VI PAPER-VIII
45 hrs(2hrs/ week)

Unit I: Introduction To Food Processing

Biotechnology in relation to the food industry, nutritive value of food, and types of microorganisms

associated with food, its sources, types and behavior in foods.

Unit II: Bioprocessing

Bioprocessing of meat, fisheries, vegetables, dairy products, enzymes and chemicals used in food processing, biochemical engineering for flavor and food production, cryopreservation, irradiated foods.

UNIT-III: Dairy products, non-beverage plant products, beverages and related products of baking.

Quality Control

Quality control, case studies on Biotechnology in the evolution of food quality.

Food Spoilage & Food Borne Diseases

UNIT-IV: Food -borne infections & intoxications.

Food Microbiology I

Utilization of microorganisms in food Industry, Single cell protein, Nutraceuticals etc.,

Food Microbiology II

Natural and artificial sweeteners and their role in controlling diseases and deficiencies.

Reference Book :

1. Roger A., Gordan B., and John T., Food Biotechnology, 1989.
2. Frazier, Food Microbiology,

REFERENCES

1. George J.B., Basic Food Microbiology, CBS Publishers Distributors, 1987.
2. James M .J. Modern Food Microbiology, CBS Publishers & Distributors, 1987.
3. Lindsay, Willis Biotechnology, Challenges for the flavor and food Industries, Elsevier Applied Science, 1988.

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NAGARJUNA GOVERNMENT COLLEGE
AUTONOMOUS
MODEL QUESTION PAPER
III YEAR –SEMISTER-VI PAPER-VIII
FOOD SCIENCE & TECHNOLOGY (APPLIED ELECTIVE-II)
SECTION-A

TIME 2.30 hrs

MARKS: 70

I. ANSWER THE FOLLOWING QUESTIONS

5X2=10

1. Nutritive value of food
2. cryopreservation
3. Bioprocessing of meat
4. Food Spoilage
5. Neutraceuticals

SECTION-B

II. ANSWER ANY FOUR OF THE FOLLOWING QUESTIONS

4X5=20

6. Write the importance of food processing.
7. Write about dairy products.
- 8.. Give two Food Borne Diseases.
9. Write the evolution of food quality.
10. Give some Single cell protein
11. Write the characteristics Natural and artificial sweeteners

SECTION –C

III. ANSWER THE FOLLOWING QUESTIONS

4X10=40

12. a.) Describe the types of microorganisms associated with food, its sources?
Or
b.) Write the different types of microorganisms involved in food processing ?
13. a.) Write in detail about Dairy products ?
Or
b.) Describe biochemical engineering for flavor and food production?
14. a.) Describe the cryopreservation, irradiated foods.
Or
b.) Write in detail about the Quality Control of foods?
Or
15. a.) Describe Utilization of microorganisms in food Industry?
b.) Write in detail about Food -borne infections & intoxications

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NAGARJUNA GOVERNMENT COLLEGE(A),NALGONDA
PANEL OF EXAMINERS FOR THE ACADEMIC YEAR2016-17
DEPARTMENT OF BIOTECHNOLOGY

S.N O	SUBJECT	S. N O	Name Designation, Workingaddress/Mobile No/ Email ID	Residential Address	Remarks
1	FIRST YEAR (PAPER-I) CELL BIOLOGY AND GENETICS	1	Dr.T.Sivaram Asst Prof	HOD Dept of Biotech, MGU, NLG	9032694559
2		2	Dr.K.Premasagar Asst Prof	Dept of Biotechnology ,MGU,NLG	8500275976
3		3	Dr.M.Thirumala Asst Prof	Dept. of Biochemistry, MGU.Nalgonda	9490705105
4	FIRST YEAR (PAPER-II) NUCLEIC ACIDS AND BIOINFORMATICS	1	Dr.K.Premasagar Asst Prof	Dept of Biotechnology ,MGU,NLG	8500275976
5		2	Dr.T.Sivaram Asst Prof	HOD Dept of Biotech, MGU, NLG Dept	9032694559
6		3	Dr.K.Venugopal Rao Asst Prof	Dept of Pharma Biotech	9849170415
7	SECOND YEAR (PAPER-III) BIOLOGICAL CHEMISTRY	1	Dr.M.RAMCHANDER Asst Prof	Dept of Biochemistry(MGU,NLG)	9989427725
8		2	Dr.M.Thirumala Asst Prof	Dept. of Biochemistry, MGU.Nalgonda	9490705105

9		3	Dr.T.Sivaram Asst Prof	HOD Dept of Biotech,MGU,NLG Dept	9032694559
S.NO	SUBJECT	S.NO	Name Designation, Working address/Mobile No/ Email ID	Residential Address	Remarks
10	SECOND YEAR (PAPER-IV) BIOLOGICAL CHEMISTRY	1	Dr.K.VenugopalRao Asst Prof	Dept of Pharma Biotech	9849170415
11		2	Dr.M.RAMCHANDER Asst Prof	Dept of Biochemistry(MGU,NL G)	9989427725
12		3	Dr.K.Premsagar Asst Prof	Dept of Biotechnology ,MGU,NLG	9989427725 85002 759 76
13	THIRD YEAR (PAPER-V) MOLECULAR BIOLOGY	1	Dr.K.Premsagar Asst Prof	Dept of Biotechnology ,MGU,NLG	9989427725 85002 759 76
14		2	Dr.M.RAMCHANDER Asst Prof	Dept of Biochemistry(MGU,NL G)	9989427725
15		3	Dr.Mahender Aileni Asst Prof	Dept of Pharmaceutical Biotechnology	9848705652
16	THIRD YEAR (PAPER-VI Advanced ELECTIVES) Genetic Engineering & Immunology/En vironmental Biotechnology	1	Dr.M.RAMCHANDER Asst Prof	Dept of Biochemistry(MGU,NL G)	9989427725
17		2	Dr.K.VenugopalRao Asst Prof	Dept of Pharma Biotech	9849170415
18		3	Dr.T.Sivaram Asst Prof	HOD Dept of Biotech,MGU,NLG Dept	9032694559
19	THIRD YEAR (PAPER-VII) ANIMAL & PLANT BIOTECHNOLO GY	1	Dr.K.VenugopalRao Asst Prof	Dept of Pharma Biotech	9849170415
20		2	Dr.M.RAMCHANDER Asst Prof	Dept of Biochemistry(MGU,NL G)	9989427725
21		3	Dr.Mahender Aileni Asst Prof	Dept of Pharmaceutical Biotechnology	9848705652
22	THIRD YEAR(PAPER- VIII Applied electives) Industrial Biotechnology/Fo od science and technology	1	Dr.M.RAMCHANDER Asst Prof	Dept of Biochemistry(MGU,NL G)	9989427725
23		2	Dr.K.VenugopalRao Asst Prof	Dept of Pharma Biotech	9849170415
		3	Dr.Mahender Aileni Asst Prof	Dept of Pharmaceutical Biotechnology	9848705652

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