GOVERNMENT COLLEGE (AUTONOMOUS),
RAJAHMUNDRY

DEPARTMENT OF BIOTECHNOLOGY

BOARD OF STUDIES

2014-2015

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.

DEPARTMENT OF BIOTECHNOLOGY

Consolidated Report of Board of Studies for the year 2014 – 2015

The Board of studies of Biotechnology Department was convened on 12- 05-2014 at 10.00 A.M under the Chairmanship of **K.Vasudha,** Lecturer In-charge, Department of Biotechnology.

The following members were present:

S. No	Name		Signature
1.	**Dr.A.Matta Reddy,** Asossiate Professor, Dept.of Zoology, Aadikavi Nannaya University, Rajahmundry.	University Nominee	
2	**Dr.J.Lalitha Bharathi** H.O.D, Dept.of Zoology, S.R.K college for Women, Rajahmundry.	Local Nominee	
3	**Dr.K.Sarala,** Principal Scientist, Crop Improvement Division, CTRI, Rajahmundry.	Scientist (Industrial Nominee)	
4	**K.Vasudha,** Lecturer incharge, Dept of-Biotechnology.	Staff Member	
5.	**Dr.B.Nageswari,** Lecturer, Dept.of Biotechnology.	Staff Member	
6		Student	
7		Student	

The following documents are submitted to the Academic coordinator and Controller of Examinations:

1. Resolutions of Board of Studies Meeting.
2. Syllabi of I, II, III, IV, V, and VI semesters.
3. Model question papers of all semesters which include both theory and practical's for Paper I, II, III,& IV.
4. List of revised Examiners (if any)
5. Any other new proposals.

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.
Board of Studies Meeting 2014 – 2015

Department of Biotechnology – Approved List of Examiners/Paper setters

S.No	Name of the Lecturer/ Reader	College
1	Lecturers in Service	PR college(A), Kakinada
2		Ideal Degree College(A), Kakinada
3		ASD Govt.College for Women, Kakinada
4		VS Lakshmi College, Kakinada
5		DNR college(A), Bhimavaram
6		K.G.R.L College(A), Bhimavaram
7		CR Reddy College(A), Eluru
8		Y.N.College(A), Narsapur
9		S.K.B.R college(A), Amalapuram
10		VS Krishna Govt.college, Visakhapatnam
11		Women's college, Visakhapatnam
12		SRR college, Vijayawada
13		Govt.college for Men, Srikakulam
14		Govt.college for Women, Srikakulam
15		AVN Degree college, Kakinada

Members: 1. 2.

3.

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.

DEPARTMENT OF BIOTECHNOLOGY

Board Of Studies Meeting Minutes

The BOS meeting in Biotechnology subject for the year 2014-2015 was held in the Department of Biotechnology on 12-05-2014 at 10AM with **K.Vasudha,** Lecturer In Charge, in the Chair along with the following members.

1.University Nominee (Member) : **Dr.A.Matta Reddy,**
Associate Professor,
Dept.of Zoology,
Aadikavi Nannaya University, Rajahmundry.

2. Local Nominee (Member) : **Dr.J.Lalitha Bharathi**
H.O.D, Dept.of Zoology,
S.R.K college for Women, Rajahmundry

3. Scientist (Member) : **Dr.K.Sarala**,
Principal Scientist,
Crop improvement division, CTRI,
Rajahmundry

4. Faculty Member : **K.Vasudha,** Lecturer incharge,
Dept.of Biotechnology

5. Faculty Member : **Dr.B.Nageshwari,** Lecturer
Dept.of Biotechnology

6. Student Member :

7. Student Member :

The members present discussed various aspects of the Syllabi, Model Question Papers of both Theory and Practical for three year B.Sc., degree course in Biotechnology that is to be implemented for the academic year 2014-2015 and resolved the following.

Resolutions:

1. It is resolved to introduce **CBCS(Choice Based Credit System)** from 2014 – 15 for I B.Sc Biotechnology students as prescribed by **Commissionerate of Collegiate Education, A.P., Hyderabad.**

2. It is resolved to adopt the common core curriculum prescribed by **Aadikavi Nannaya University** for **B.Sc I yr Biotechnology** students and the syllabus was divided into Modules.

3. It is resolved to adopt the common core curriculum prescribed by AP State Council of Higher Education, for B.Sc (Biotechnology) since the course is run in semester system in this college the syllabus is divided equally into two semesters in each year.

4. It is resolved to adopt the same question paper model for all the three years, which is being followed by **Aadikavi Nannaya University and Andhra University, Visakhapatnam for the year 2014-2015.**

5. It is resolved to include two topics each as **Additional inputs** for I B.Sc and II B.Sc and III B.Sc in each semester in addition to the syllabi prescribed.

6. It is resolved to adopt weight age of marks in theory and practical's for I, II, III B.Sc (Biotechnology) as recommended by **Aadikavi Nannaya University and Andhra University as shown below:**

Theory – Semester End Exam	- 75 marks
Internal exams(Best of two exams -)	- 15 marks
Viva – voce	- 10 marks
Total	- 100 marks

7. It is resolved to conduct Practical exams at the end of even number semester in CBCS system.

Practical – Year End Exam	- 75 marks
Internal Exam	- 25 marks
Total	- 100 marks

8. It is resolved to approve the list of examiners enclosed in the next page for the Academic year 2014-15.

Signature of the members present: -

1.
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Rajahmundry
Date:12.05.2014

Chairman,
Board of Studies

GOVERNMENT COLLEGE (A), RAJAHMUNDRY

DEPARTMENT OF BIOTECHNOLOGY

ADDITIONAL INPUTS INTO SYLLABUS 2014-2015

The topics which are related to the prescribed syllabus, which are of importance either as academic or application are selected and included in the syllabus as Additional inputs.

The information regarding the research activities and achievements of various Local / Regional organizations, like CTRI,SIFT,CIFE is collected and considered as a part of the curriculum of III B.Sc course so as to encourage the students to opt for research in this vast field of science.

I B.Sc **MODULE I** - Regulation and Importance of Cell Cycle

MODULE II - Culture media and selective media for isolation of microbes.

II B.Sc **III Semester -** Biochemical disorders – Phenylketonuria, Alkaptonuria, Haemophilia

IV Semester - Culture media and Selective media for isolation of microbes

III B.Sc **V Semester**

Paper III Inhibitors of Protein Synthesis

Paper IV Applications of Animal & Industrial Biotechnology

VI Semester

Paper III Molecular markers- RFLP, RAPD- Procedure and Applications.

Paper IV Transgenic plants production – Bioinsecticides

Members:

1. 2. 3.

GOVERNMENT COLEGE (A), RAJAHMUNDRY
I B.SC BIOTECHNOLOGY
MODULE I -- CELL BIOLOGY
CORE - I: Theory Syllabus – 2014-2015.

Cell Structure, Function and Cell Division (30hrs)

Unit I

1. Cells as basic units of living organisms - Viral, Bacterial, Fungal, Plant and Animal cells
2. Ultra structure of Prokaryotic cell (Cell membrane, Plasmids)
3. Ultra structure of eukaryotic cell (Cell wall, Cell membrane, Mitochondria,
4. Chloroplast, Endoplasmic reticulum, Golgi apparatus, Vacuoles)

Unit II

1. Chromosome organization in Prokaryotes and Eukaryotes
2. Structure of specialized chromosomes (Polytene and Lampbrush)
3. Cell division and Cell cycle
4. Significance of mitosis and meiosis

Additional Input: Regulation and Importance of Cell Cycle

Structure and Function of Nucleic acids (30hrs)

Unit III

1. DNA as the genetic material – Griffith's experiments on transformation in *Streptococcus pneumonia.* Avery, McEleod and Mc Carty's experiments. Hershey – Chase experiments with radio-labelled T_2 bacteriophage
2. RNA as genetic material – Tobacco Mosaic Virus
3. Structure of DNA – Watson and Crick Model; Forms of DNA – A, B and Z forms of DNA, Super coiled and relaxed DNA – Role of topoisomerases.

Unit IV

1. DNA replication – Models of DNA Replication (Semi-conservative, non-conservative models) Mechanisms of DNA replication – Linear and circular – Rolling circle and Theta mechanism of replication.
2. DNA Damage and Repair

Reference Books:

1. Genetics – By Gardner (McMillan Press)
2. An Introduction to Genetic Analysis – By Griffith and others- Freeman & Company
3. Biotechnology – By K. Trehan
4. Cell and Molecular Biology – By De Robertis
5. Cell and Molecular Biology – By Lodish
6. Cell Biology and Genetics – By P. K. Gupta
7. Biotechnology - K. Trehan
8. Biotechnology –1 - R.S. Setty and G.R. Veena
9. Biotechnology – II - R.S. Setty and V. Sreekrishna
10. Molecular Biology - David Friefeilder
11. Cell Biology - By S.C. Rastogi (New Age International (P) Ltd)
12. The World of the Cell - By Becker (Pearson Education)

Members:

1. 3.

2.

GOVERNMENT COLEGE (A), RAJAHMUNDRY
I B.Sc., Biotechnology
Module – I (At the end of Core-I) CELL BIOLOGY
Question Paper Design and Guidelines to Paper setter

Time : 3 Hours Max.Marks : 75

Very short notes : 3 from cell structure, function and cell division. 2 X 6 = 12M
3 from Structure and function of Nucleic acids.

Short notes : 3 from cell structure, function and cell division. 5 X 3 = 15M
3 from Structure and function of Nucleic acids.

Essay questions : (with choice) 12 X 4 = 48M

3 from cell structure, function and cell division - Unit - I & Unit - II
3 from Structure and function of Nucleic acids - Unit – III & Unit – IV

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Name of the Unit	No. of very short Answers	No . of Short answers	No. of Essays	Weightage of Marks
cell structure, function and cell division Unit – I &Unit – II	**3**	**3**	**3**	**3x2=06 3x5=15 3x12=36**
Structure and function of Nucleic acids Unit - III & Unit - IV	**3**	**3**	**3**	**3x2=06 3x5=15 3x12=36**

Members: 1. 2. 3.

GOVERNMENT COLEGE (A), RAJAHMUNDRY
I B.Sc., Biotechnology Module – I (At the end of Core I)
CELL BIOLOGY - Model Question Paper

Time : 3 hrs Max . Marks : 75

SECTION – A

Answer *ALL* of the following Questions. 6 X 2 = 12M

1.Euchromatin
2.Nucleoid
3.Cyclins
4. DNA Gyrases
5.Nucleotide
6.Transformation

SECTION – B

Write Short notes on any *THREE* of the following. 3 X 5 = 15M

7.Plasmids
8.Structure of Virus
9.Mitosis
10.Theta mechanism of replication.
11.Topoisomerases and their role in replication.
12. Prove RNA as Genetic material

SECTION – C

Answer any *FOUR* of the following choosing at least two Questions from Part – A & Part – B. 4 X 12 = 48M

PART – A

13. Explain about Ultra structure of Prokaryotic cell.
14. Write about structure of specialized Chromosomes
15. Write an essay on Meiosis and its significance .

PART – B

16. Prove DNA as the genetic material with any two experiments.
17. Explain about Watson and Crick model of DNA structure.
18. Explain about semi conservative model of DNA replication.

Members: 1. 2. 3.

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.
I B.Sc BIOTECHNOLOGY
Module II – GENETICS and MICROBIOLOGY
Core -II: Theory Syllabus - 2014-2015

Mendel's Laws and Mechanism of Inheritance (30 hours)

Unit I

1. Mendel's experiments – Factors contributing to success of Mendel's experiments
2. Law of segregation – Monohybrid ratio
3. Law of Independent assortment – Dihybrids, Trihybrids
4. Deviation from Mendel's Laws - partial or incomplete dominance, co-dominance
5. Penetrance and expressivity, pleiotropism
6. Epistatic gene interaction – Modified dihybrid ratios (12:3:1; 9:7; !5:1; 9:3:4:, 9:6:1; 13:3)

Unit II

1. Genes and environment – phenocopies
2. Linkage and recombination – Discovery of linkage, cytological proof of crossing over
3. Recombination frequency and map distance
4. Interference and coincidence
5. Mitotic crossing over in *Drosophila*
6. Mechanism of sex determination-geneic balance theory - *Drosophila*
7. Homogametic and Heterogametic theory (Human, Mammalian, Birds)
8. X – linked inheritance (eg. Haemophilia)

Fundamentals of Microbiology (30 hours)

Unit III

1. Outlines of classification of micro organisms
2. Structure, Identification and general characters of Viruses, Bacteria, Fungi and Micro Algae (One example from each group)
3. Disease causing pathogens and their symptoms (examples; Typhoid, HIV only)

Unit IV

1. Isolation, identification and preservation of microorganisms (Bacteria)
2. Methods of sterilization
3. Bacterial reproduction and growth kinetics (Batch and continuous cultures)
4. Pure cultures and cultural characteristics

Additional Input:

Culture media and selective media for isolation of microbes.

Recommended Books

1. Genetics - By Gardner (Macmillan Press)
2. An introduction to Genetic Analysis - By Griffith and others – Freeman and Company
3. Statistical Genetics – Principles and Practice - By Prem Narain
4. Fundamentals of Genetics – By B.D. Singh, N. Pratibha, P.H. Rao and P.B. Kavi Kishor
5. Genetics - By B.D. Singh
6. Theory and Problems in Genetics - By Stransfield
7. Genetics - By Strickberger (Pearson Education)
8. Text Book of Microbiology - By Ananthanarayan and Paniker
9. Microbiology - B.J. Pelczar, E.S.N. Cfan and N.R. Kreig, McGraw Hill Publ.
10. General Microbiology – By Stanier, R.Y, J.L. Ingrahm, M.L. Wheel is & P.R. Painter
11. General Microbiology – By Powar (Vol. I and Vol. II).
12. Practical Microbiology - By Aneja.

Members: 1. 2. 3.

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.
I B.Sc BIOTECHNOLOGY
Module – II GENETICS and MICROBIOLOGY (At the end of Core - 2)
Question Paper Design and Guidelines to Paper setter

Time : 3 Hours Max . Marks : 75

Very short notes : 3 from Mendel's Laws and Mechanism of Inheritance. 2 X 6 = 12M
3 from Fundamentals of Microbiology.

Short notes 3 from Mendel's Laws and Mechanism of Inheritance 5 X 3 = 15M
3 from Fundamentals of Microbiology

Essay questions : With choice 12 X 4 = 48M
3 from Fundamentals of Microbiology. - Unit I & Unit II
3 from Mendel's Laws and Mechanism of Inheritance - Unit III & Unit IV

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Name of the Unit	No. of very short Answers	No . of Short answers	No. of Essays	Weightage of Marks
Mendel's Laws and Mechanism of Inheritance Unit – I & Unit – II	**3**	**3**	**3**	**3x2=06 3x5=15 3x12=36**
Fundamentals of Microbiology Unit - III & Unit - IV	**3**	**3**	**3**	**3x2=06 3x5=15 3x12=36**

Members: 1. 2. 3.

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.
I B.Sc., Biotechnology– MODULE II (At the end of Core-2)
GENETICS and MICROBIOLOGY- Model Question Paper

Time : 3 hrs Max . Marks : 75
Note : Draw Diagrams wherever necessary.

SECTION – A

Answer *ALL* of the following Questions. 6 X 2 = 12M

1.Pleiotropism
2.Epistasis
3.Bactriophage
4. Linkage
5. Typhoid
6. Resolving power

SECTION – B

Write Short notes on any *THREE* of the following. 3 X 5 = 15M

7.Law of Segregation
8.Turner's Syndrome.
9.Classification of virus
10. Modified dihybrid ratio 15 : 1
11. Cyanobacteria
12. Inverted Microscope.

SECTION – C

Answer any *FOUR* of the following choosing at least two Questions from Part – A & Part – B. 4 X 12 = 48M

PART – A

13.Define law of Independent Assortment and explain about Dihybrid cross with example.
14. Describe about cytological proof of crossing over.
15. Explain about mechanism of sex determination .

PART – B

16. Give detail account on Isolation ,Identification and Preservation of Microorganisms?
17. Write different methods of sterilization techniques ?
18. Write in detail about classification of Microorganisms ?

Members: 1. 2. 3.

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.
I B.Sc BIOTECHNOLOGY
Module I & II -- CELL BIOLOGY, GENETICS, MICRO BIOLOGY
Practical Syllabus - 2014-2015
(At the end of Core-2)

Practicals (3 hrs/ week)

1. Monohybrid and dihybrid ratio in *Drosophila*/maize
2. Estimation of DNA by diphenylamine method
3. Estimation of RNA by orcinol method
4. Preparation of different stages of Mitosis and Meiosis
5. Types of chromosomes
6. Technique of Micrometry (Stage and ocular)
7. Preparation of routine microbiological media.
8. Isolation of common non-pathogenic bacteria
9. Staining and identification of bacteria – *E.coli*, *Pseudomonas*, *Bacillus* and *Staphylococcus*

Practical Model Paper - 2014-2015 (At the end of Core-2)

Module I & II -- CELL BIOLOGY , GENETICS and MICRO BIOLOGY

Time 3 hrs Max. Marks: 75

1. Estimate the amount of DNA present in the given sample by constructing a standard graph using diphenylamine reagent. 20 M
2. Problem on Monohybrid and Dihybrid ratio in Drosophila/Maize. 15M

(or)

Prepare nutrient agar media for bacterial growth. 15 M

3. Spotters (5x5) 25M
4. Record & Viva-voce 15 M

Total 75 M

Members: 1. 2. 3.

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.

II B.Sc BIOTECHNOLOGY

Paper-II BIOLOGICAL CHEMISTRY AND MICROBIOLOGY

III – Semester: Theory Syllabus - 2014-2015

SECTION-A

Biomolecules

Unit I

1.1 **Carbohydrates:** Importance, classification and properties

1.2 Structure, configuration and biochemical importance of monosaccharides (glucose and fructose)

1.3 Disaccharides – Structure and biochemical importance of sucrose and trehalose; Physiologically important glycosides (streptomycin, cardiac glycosides, ouabain)

1.4 Structure and function of homo polysaccharides – starch, inulin, cellulose and glycogen; Structure and function of hetero polysaccharides – hyaluronic acid

1.5 **Proteins:** Classification, structure and properties of amino acids

1.6 Peptide bond **–** synthesis and characters

Primary, secondary, tertiary and quaternary structures of proteins

Unit II

1.7 **Lipids:** Fatty acids – saturated and unsaturated

1.8 Triacylglycerols, Sphingolipids, Sterols, Phospholipids (phosphatidic acid, phosphatidylcholine)

1.9 **Enzymes:** Classification and nomenclature; Kinetics of enzyme catalysed reactions

1.10 Factors influencing enzymatic reactions – pH, Temperature, Substrate concentration, Enzyme concentration

1.11 Enzyme inhibition – Competitive and non-competitive

SECTION-B

Intermediary Metabolism

Unit I

2.1 Glycolysis

2.2 Citric acid cycle

2.3 Gluconeogenesis and its significance

2.4 Mitochondrial electron transport, Chemiosmotic theory of ATP synthesis

2.5 β-Oxidation of fatty acid

2.6 Deamination, Decarboxylation an transamination reactions of aminoacids

Unit II

2.7 Catabolism of amino acids – phenylalanine and tyrosine (phenylketonuria and albinism)

2.8 Photosynthesis – Light reaction and photophosphorylation

2.9 Carbon assimilation

Additional Input:

Biochemical disorders – Phenylketonuria, Alkaptonuria, Haemophilia.

Recommended Books

1. Biochemistry – By Dr. U. Satyanarayana, U. Chakrapani
2. Biochemistry – By J.L. Jain
3. Biochemistry – By Lehninger
4. Biochemistry – By Stryer
5. Biochemistry – By Voet and Voet
6. Biochemistry (Jaypee) – By Vasudevan
7. Textbook of Medical Biochemistry – By S. Ramakrishnan, R. Rajan, and K.G. Prasannan (Orient Longman)
8. Biochemistry – By K Trehan
9. Biochemical methods – By S.Sadasivam and A.Manickam
10. An introduction to Practical Biochemistry – By T. Plummer

Members:

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3.

GOVERNMENT COLLEGE (AUTONOMOUS), RAJAHMUNDRY

II B.Sc., Biotechnology Paper – II (At the end of III Semester)

BIOLOGICAL CHEMISTRY AND MICROBIOLOGY

Question Paper Design and Guidelines to Paper setter

Time : 3 Hours Max . Marks : 75

Very short notes : 3 from Biomolecules. 2 X 6 = 12M

3 from Intermediary Metabolism.

Short notes : 3 from Biomolecules . 5 X 3 = 15M

3 from Intermediary Metabolism.

Essay questions : With choice 12 X 4 = 48M

3 from - Biomolecules - Unit I & Unit II

3 from Intermediary Metabolism. - Unit I & Unit II

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Unit II Name of the Unit	No. of very short Answers	No . of Short answers	No. of Essays	Weightage of Marks
Biomolecules. Unit – I Unit – II	3	3	3	3x2=06 3x5=15 3x12=36
Intermediary Metabolism. Unit - I Unit - II	3	3	3	3x2=06 3x5=15 3x12=36

Members:

1. 2. 3.

GOVERNMENT COLLEGE (AUTONOMOUS), RAJAHMUNDRY
II B.Sc., Biotechnology Paper – II (At the end of III Semester)
BIOLOGICAL CHEMISTRY AND MICROBIOLOGY
Model Question Paper –OCT/NOV– 2014

Time : 3 hrs Max . Marks : 75

Note : Draw Diagrams wherever necessary.

SECTION – A

Answer *ALL* of the following Questions **6 X 2 = 12M**

1.Lipoproteins
2.Cellulose
3.Phospholipids
4. Structure of Fructose
5.Streptomycine
6.Essential amino acids

SECTION – B

Write Short notes on any *THREE* of the following. **3 X 5 = 15M**

7.Structure and Functions of Cholesterol
8.Factors effecting enzymatic reaction
9. β- Oxidation of fatty acids.
10.Transamination.
11.Explain the structure and properties of Phospholipids.
12. Structure and Biochemical importance of starch.

SECTION – C

Answer any *FOUR* of the following choosing at least two Questions from Part – A & Part – B. **4 X 12 = 48M**

PART – A

13. what are Carbohydrates and classify them with examples and write their importance.
14. Explain in detail about various structural level of protein organization.
15. write an essay on classification of lipids ?.

PART – B

16. Explain various steps involved in citric acid cycle add a note on ATP synthesis.
17. What is Mitochondrial Electron Transport chain?
18. Define Photosynthesis and add a note on light reactions of photosynthesis?.

Members :

1. 2. 3.

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.

II B.Sc BIOTECHNOLOGY

Paper-II BIOLOGICAL CHEMISTRY AND MICROBIOLOGY

IV – Semester: Theory Syllabus - 2014-2015

SECTION-A

Fundamentals of Microbiology

Unit I

1.1 Outline of classification of microorganisms

1.2 Structure and general characters of viruses, Bacteria, Fungi and Micro Algae (one example from each group)

1.3 Disease causing pathogens and their symptoms (examples: Typhoid, HIV only)

1.4 Isolation, identification and preservation of microorganisms (bacteria)

Unit II

1.5 Identification methods of Fungi and useful Micro Algae

1.6 Methods of Sterilization

1.7 Bacterial reproduction and growth kinetics (Batch and continuous cultures)

1.8 Pure cultures and cultural characteristics

Additional Input:

Culture media and Selective media for isolation of microbes.

SECTION-B

Principles and Applications of Biophysical Techniques

Unit I

2.1 Microscopy – Light, Inverted, Fluorescent and Electron microscopy

2.2 Colorimetry – Beer-Lambert's law

2.3 UV- VIS Spectrophotometry

2.4 Chromatography – Paper, Thin Layer, Ion exchange, Gel-filtration

Unit II

2.5 Electrophoresis – Native gels and SDS-PAGE, Agarose

2.6 Centrifugation and filtration – Basic Principles

2.7 Dialysis and lyophilization

2.8 Radio isotopes and their uses in biology

Recommended Books

1. Text Book of Microbiology – By Ananthanarayan and Paniker

2. Microbiology – By J.Pelczar, E.S.N. Cfan and N.R. Kreig, McGraw Hill Publ.
3. General Microbiology – By Stanier R.Y, J.L. Ingrahm, M.L. Wheel & P.R.Painter
4. General Microbiology – By Powar (Vol. I and Vol. II)
5. Practical Microbiology – By Aneja

Members:

1.

2.

3.

GOVERNMENT COLLEGE (AUTONOMOUS), RAJAHMUNDRY
II B.Sc., Biotechnology Paper – II (At the end of IV Semester)
BIOLOGICAL CHEMISTRY AND MICROBIOLOGY
Question Paper Design and Guidelines to Paper setter

Time : 3 Hours Max . Marks : 75

Very short notes : 3 from Fundamentals of Microbiology. 2 X 6 = 12M
3 from Principles and Applications of Biophysical techniques.

Short notes : 3 from Fundamentals of Microbiology. 5 X 3 = 15M
3 from Principles and Applications of Biophysical techniques.

Essay questions : With choice 12 X 4 = 48M
3 from - Fundamentals of Microbiology - Unit I & Unit II

3 from - Principles and Applications of

Biophysical techniques. - Unit I & Unit II

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Name of the Unit	No. of very short Answers	No . of Short answers	No. of Essays	Weightage of Marks
Fundamentals of Microbiology Unit – I Unit – II	3	3	3	3x2=06 3x5=15 3x12=36
Principles and Applications of Biophysical techniques. Unit - I Unit - II	3	3	3	3x2=06 3x5=15 3x12=36

Members:
1. 2. 3.

GOVERNMENT COLLEGE (AUTONOMOUS), RAJAHMUNDRY
II B.Sc., Biotechnology Paper – II (At the end of IV Semester)
BIOLOGICAL CHEMISTRY AND MICROBIOLOGY
Model Question Paper –MAR/APR– 2015

Time : 3 hrs Max . Marks : 75

Note : Draw Diagrams wherever necessary.

SECTION – A

Answer *ALL* of the following Questions. 6 X 2 = 12M

1.SDS
2.Typhoid
3.Resolving power
4. Bacteriophage
5.Agar
6.Transtormations

SECTION – B

Write Short notes on any *THREE* of the following. 3 X 5 = 15M

7. Cyanobacteria
8. Classification of Viruses
9. Inverted Microscope.
10.Bacterial Growth curve.

11.Ultracentrifuge 12. Thin-layer chromatography.

SECTION – C

Answer any *FOUR* of the following choosing at least two Questions from Part – A & Part – B. **4 X 12 = 48M**

PART - A

13. Write in detail about classification of Microorganisms ?
14. Give detail account on Isolation ,Identification and Preservation of Microorganisms?
15. Write different methods of sterilization techniques ?

PART - B

16. What is an Electron Microscope? Explain their types with applications ?
17. Give the working principle, procedure and applications of Gel Electrophoresis?
18. What is Radioisotopes and their uses in biology?

Members :

1. 2. 3.

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.

II B.Sc BIOTECHNOLOGY

Paper-II BIOLOGICAL CHEMISTRY AND MICROBIOLOGY

Practical Syllabus - 2014-2015

(At the end of IV Semester)

1. Preparation of Normal, Molar and Molal solutions
2. Preparation of buffers (Acidic, Neutral and Alkaline buffers)
3. Qualitative tests of sugars, amino acids and lipids
4. Estimation of protein by Biuret method
5. Estimation of total sugars by anthrone method
6. Separation of amino acid by paper chromatography
7. Electrophoretic separation of proteins (SDS-PAGE)
8. Technique of Micrometry (Stage and ocular)
9. Enzyme assay – Catalase or invertase (or any other enzyme)
10. Preparation of routine microbiological media
11. Isolation of common non-pathogenic bacteria
12. Staining and identification of bacteria –*E. coli, Pseudomonas, Bacillus and Staphylococcus*

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.

II B.Sc BIOTECHNOLOGY

Paper-II BIOCHEMISTRY AND MICROBIOLOGY

Practical Model Paper - 2014-2015

(At the end of IV Semester)

Time – 3 hrs **Max. Marks: 75**

1. Qualitative / Quantitative estimation of Biomolecules		20 M
2. Prepare nutrient agar media for bacterial growth.		15 M
3. Spotters	(5x5)	25M
4. Record & Viva-voce		15 M
	Total	75 M

Members:

1. 3.

2.

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.

III B. SC BIOTECHNOLOGY

Paper III - MOLECULAR BIOLOGY AND GENETIC ENGINEERING AND IMMUNOLOGY

V Semester : Theory Syllabus – 2014-2015

SECTION-A

Gene and Genome Organization

Unit I

1.1 Organization of nuclear genome – Genes and gene numbers – essential and non essential genes.

1.2 Denaturation and renaturation of DNA – Tm 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

Unit II

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.

SECTION-B

Gene Expression and Gene Regulation

Unit I

2.1 Prokaryotic and Eukaryotic Transcription

Post – transcriptional modifications (Capping, Polyadenylation, Splicing and alternate splicing)

2.2 Translation

Unit II

2.3 Genetic code and its features, Wobble hypothesis

Synthesis of Polypeptides – Initiation, elongation and termination in Prokaryotes and eukaryotes.

2.4 Regulation of Gene expression in Prokaryotes and eukaryotes

Operon concept in Bacteria – Lac Operon.

Additional Input: Inhibitors of Protein Synthesis

Recommended Books:

1. Cell and Molecular Biology – By Roberties & Roberties
2. Molecular Biology & Biotechnology – By H.D.Kumar
3. Molecular Biotechnology – By G.R.Glick
4. Molecular Biology of Gene – By Watson
5. Microbial Genetics – By S.R.Maloy
6. Molecular Biology – By David Freifelder
7. Cell and Molecular Biology – By S.C.Rastogi

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GOVERNMENT COLLEGE (AUTONOMOUS), RAJAHMUNDRY

III B.Sc., Biotechnology Paper – III (At the end of V Semester)

MOLECULAR BIOLOGY AND GENETIC ENGINEERING AND IMMUNOLOGY

Question Paper Design and Guidelines to Paper setter

Time : 3 Hours Max . Marks : 75

Very short notes : 3 from Gene and Genome Organization. 2 X 6 = 12M

3 from Gene Expression and Gene Regulation .

Short notes : 3 from Gene and Genome Organization . 5 X 3 = 15M

3 from Gene Expression and Gene Regulation .

Essay questions : With choice 12 X 4 = 48M

3 from - Gene and Genome Organization - Unit I & Unit II

3 from - Gene Expression and Gene Regulation. - Unit I & Unit II

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Name of the Unit	**No. of very short Answers**	**No . of Short answers**	**No. of Essays**	**Weightage of Marks**

Gene and Genome Organization Unit – I Unit – II	3	3	3	3x2=06 3x5=15 3x12=36
Gene Expression and Gene Regulation Unit - I Unit - II	3	3	3	3x2=06 3x5=15 3x12=36

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GOVERNMENT COLLEGE (AUTONOMOUS), RAJAHMUNDRY
III B.Sc., Biotechnology Paper – III (At the end of V Semester)
MOLECULAR BIOLOGY,GENETIC ENGINEERING AND IMMUNOLOGY
Model Question Paper –OCT/NOV– 2014

Time : 3 hrs Max . Marks : 75

Note : Draw Diagrams wherever necessary.

SECTION – A

Answer *ALL* of the following Questions. 6 X 2 = 12M

1. Gene
2. Genetic code
3. Histones
4. Promoters
5. Denaturation
6. Codon

SECTION – B

Write Short notes on any *THREE* of the following. 3 X 5 = 15M

7. Single copy sequences
8. Wobble Hypothesis
9. Inhibitors.
10. Satellite DNA.
11. T_M Value
12. Splicing.

SECTION – C

Answer any *FOUR* of the following choosing at least two Questions

from Part – A & Part – B. **4 X 12 = 48M**

PART – A

13. Write an essay on Organization of Nuclear Genome.
14. Give an account on Mitochondrial Genome organization.
15. Write an account on organization of Eukaryotic Genes.

PART – B

16. Write an essay on post transcriptional modifications?
17. Explain Translation process in prokaryotes and what are the steps involved in it?
18. Describe about Lac operon concept in Bacteria ?

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GOVERNMENT COLLEGE (A), RAJAHMUNDRY.

III B. SC BIOTECHNOLOGY

Paper IV – APPLICATIONS OF BIOTECHNOLOGY

V Semester : Theory Syllabus – 2014-2015

SECTION-A

Animal Biotechnology

Unit I

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

Unit II

1.6 Culture of cells and tissues(including Stem cells and their application)

1.7 Invitro 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

SECTION-B

Industrial Biotechnology

Unit I

2.1 Introduction to Industrial Biotechnology

2.2 Primary and secondary metabolic products of microorganisms

2.3 Screening and isolation and preservation of industrial microorganisms

2.4 Principles of Fermentation Technology

2.5 Commercial production of fuels and chemicals by microbial fermentations

2.6 Fermentative production of microbial enzymes(amylases, proteases), and antibiotics.

Unit II

2.7 Fermentative production of foods and dairy products.

2.8 Animal cells as bioreactors; characteristics of bioreactors, expression and over production of targeted proteins – human growth hormones – production of α and β – interferon, monoclonal antibodies.

2.9 Good manufacturing practices, Biosafety issues, Bioethics.

2.10 Intellectual Property Rights and Patenting issues.

Additional input:

Applications of Animal and Industrial Biotechnology.

Reference Books

1. Biotechnology - By K.Trehan
2. Industrial Microbiology – By L.E.Cadida
3. Elements of Biotechnology – By P.K.Gupta
4. Biotechnology – By R.C.Dubey
5. Biotechnology – By U.Satyanarayana
6. Bioprocess Engineering –By Shuler

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GOVERNMENT COLLEGE (AUTONOMOUS), RAJAHMUNDRY
III B.Sc., Biotechnology Paper – IV (At the end of V Semester)
APPLICATIONS OF BIOTECHNOLOGY
Question Paper Design and Guidelines to Paper setter

Time : 3 Hours Max . Marks : 75

SECTION - A

Very short notes : 3 from Animal Biotechnology. 2 X 6 = 12M

3 from Industrial Biotechnology.

Short notes : 3 from Animal Biotechnology . 5 X 3 = 15M

3 from Industrial Biotechnology.

Essay questions : With choice 12 X 4 = 48M

3 from Animal Biotechnology - Unit I & Unit II

3 from Industrial Biotechnology - Unit I & Unit II

BLUE PRINT

Name of the Unit	**No. of very short Answers**	**No . of Short answers**	**No. of Essays**	**Weightage of Marks**
Animal Biotechnology Unit – I Unit – II	3	3	3	3x2=06 3x5=15 3x12=36

Industrial Biotechnology Unit - I Unit - II	3	3	3	3x2=06 3x5=15 3x12=36

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GOVERNMENT COLLEGE (AUTONOMOUS), RAJAHMUNDRY
III B.Sc., Biotechnology Paper – IV (At the end of V Semester)
APPLICATIONS OF BIOTECHNOLOGY
Model Question Paper –OCT/NOV– 2014

Time : 3 hrs Max . Marks : 75

Note : Draw Diagrams wherever necessary.

SECTION – A

Answer *ALL* of the following Questions. 6 X 2 = 12M

1. Cell lines
2. Gene therapy
3. Stem cells
4. Bioethics
5. Interferons
6. Pencillin

SECTION – B

Write Short notes on any *THREE* of the following. 3 X 5 = 15M

7. Culture vessels used for animal cell culture.
8. Cell Disaggregation
9. Stem cells and their applications.
10. Secondary metabolites.
11. Bioreactors.
12. Intellectual property Rights.

SECTION – C

Answer any *FOUR* of the following choosing at least two Questions from Part – A & Part – B. 4 X 12 = 48M

PART – A

13. Write an essay on animal cell culture media preparation and sterilization.

14. Give a brief account on Invitro Fertilization and embryo transfer technology
15. Explain about various Gene transfer methods in Animals.

PART – B

16. Write an essay on Screening, Isolation and Preservation of Microorganisms.
17. Describe the production of Penicillin.
18. Write about Production of Monoclonal Antibodies.

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GOVERNMENT COLLEGE (A), RAJAHMUNDRY.
III B. SC BIOTECHNOLOGY

Paper III - MOLECULAR BIOLOGY AND GENETIC ENGINEERING AND IMMUNOLOGY

VI Semester : Theory Syllabus – 2014-2015

SECTION-A

Recombinant DNA Technology

Unit I

1.1 Enzymes used in gene cloning : Restriction endonucleases, Ligases, Phosphatases, Methylases, Kinases.

1.2 Cloning vehicles – Plasmids, Cosmids, Phage vectors, Shuttle vectors,

1.3 Baculovirus vector system, Expression vectors – expression cassettes

1.4 Construction of genomic and cDNA libraries

Unit II

1.5 Identification of cloned genes

1.6 Principles involved in Blotting Techniques – Southern,Northern and Western

1.7 Principles and applications of PCR Technology

1.8 DNA finger printing technique and its applications.

SECTION-B

Basics of Immunology

Unit I

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

Unit II

2.4 Antigen – Antibody Reactions

2.5 The Major Histocompatibility gene complex and its role in organ transplantation, Generation of antibody diversity

2.6 Hypersensitivity – Coombs classification, Types of hypersensitivity

2.7 Autoimmune diseases – mechanisms of auto immunity

Additional input:

Molecular markers- RFLP, RAPD- Procedure and Applications.

Reference Books

1. Essential Immunology - By I.Roitt

2. Principles of Gene Manipulation – By R.W.Old & S.B.Primrose

3. Immunology – By Kubey

4. Gene Biotechnology – By Jogdana

5. Gene cloning – By T.A.Brown

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GOVERNMENT COLLEGE (AUTONOMOUS), RAJAHMUNDRY
III B.Sc., Biotechnology Paper – III (At the end of VI Semester)
MOLECULAR BIOLOGY AND GENETIC ENGINEERING AND IMMUNOLOGY
Question Paper Design and Guidelines to Paper setter

Time : 3 Hours Max . Marks : 75

Very short notes : 3 from Recombinant DNA Technology 2 X 6 = 12M

3 from Basics of Immunology.

Short notes : 3 from Recombinant DNA Technology . 5 X 3 = 15M

3 from Basics of Immunology .

Essay questions : With choice 12 X 4 = 48M

3 from - Recombinant DNA Technology - Unit I & Unit II

3 from - Basics of Immunology . - Unit I & Unit II

BLUE PRINT

Name of the Unit	No. of very short Answers	No . of Short answers	No. of Essays	Weightage of Marks
Recombinant DNA Technology Unit – I Unit – II	3	3	3	3x2=06 3x5=15 3x12=36

Basics of Immunology Unit - I Unit - II	3	3	3	3x2=06 3x5=15 3x12=36

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GOVERNMENT COLLEGE (AUTONOMOUS), RAJAHMUNDRY
III B.Sc., Biotechnology Paper – III (At the end of VI Semester)
MOLECULAR BIOLOGY,GENETIC ENGINEERING AND IMMUNOLOGY
Model Question Paper –MAR/APR- 2015

Time : 3 hrs Max . Marks : 75

Note : Draw Diagrams wherever necessary.

SECTION – A

Answer *ALL* of the following Questions. 6 X 2 = 12M

1. Ligases
2. Cosmid
3. Precipitation
4. Shuttle Vector
5. Hapten
6. RFLP

SECTION – B

Write Short notes on any *THREE* of the following. 3 X 5 = 15M

7. Identification of cloned genes.
8. DNA finger printing technique.
9. Molecular scissors.
10. ELISA.
11. MHC
12. Features of an Antigen

SECTION – C

Answer any *FOUR* of the following choosing at least two Questions from Part – A & Part – B. 4 X 12 = 48M

PART - A

13. Write an essay on Enzymes used in gene cloning.

14. Write an essay on southern blotting and hybridization technique.
15. Write essay on Principles and applications of PCR?

PART - B

16. Write an essay on structure of different immune globulins and their functions?
17. What are Antigen – Antibody Reactions ?
18. Define Hypersensitivity and write about type – I hypersensitivity ?

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GOVERNMENT COLLEGE (A), RAJAHMUNDRY.

III B. SC BIOTECHNOLOGY

Paper IV – APPLICATIONS OF BIOTECHNOLOGY

VI Semester : Theory Syllabus – 2014-2015

SECTION-A

Plant Biotechnology

Unit I

1.1 Composition of media(Murashige and Skoog's and Gamborg's only)
Preparation of media and methods of sterilizations

1.2 Role of Plant growth regulators in differentiation

1.3 Induction of callus

1.4 Meristem culture and production of virus free plants
Clonal propagation of plants on a commercial scale(Somatic embryogenesis and organogenesis)

Unit II

1.5 Mass cultivation of cell cultures and process engineering – batch and continuous cultures, Bioreactors.

1.6 Production of commercially useful compounds by plant cell culture

1.7 Methods of gene transfer techniques(Agrobacterium, Microprojectile bombardment)

1.8 Applications of recombinant DNA technology in agriculture

1.9 Production of therapeutic proteins from transgenic plants

SECTION-B

Environmental Biotechnology

Unit I

2.1 Introduction to environmental biotechnology

2.2 Renewable and non-renewable energy resources

2.3 Conventional energy sources and their impact on environment.

2.4 Non-conventional fuels and their impact on environment(biogas,bioethanol,microbial hydrogen production)

2.5 Microbial analysis of milk, food and water

Unit II

2.6 Microbiological treatment of municipal and industrial effluents

2.7 Microbial degradation of pesticides and toxic chemicals

2.8 Biopesticides and Biofertilizers(Nitrogen fixing, Phosphate solubilizing microorganisms)

2.9 Microbial ore leaching

2.10 Intoduction to Bioremediation

Additional input:

Transgenic plants – Bioinsecticides

Reference Books:

1. Introduction to Plant Tissue culture – By M.K.Razdan
2. Introduction to Plant Biotechnology – By H.S.Chawla
3. Bioprocess Engineering – By Shuler
4. Plant tissue culture – By Kalyan Kumar De

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GOVERNMENT COLLEGE (AUTONOMOUS), RAJAHMUNDRY

III B.Sc., Biotechnology Paper – IV (At the end of VI Semester)

APPLICATIONS OF BIOTECHNOLOGY

Question Paper Design and Guidelines to Paper setter

Time : 3 Hours Max . Marks : 75

Very short notes : 3 from Plant Biotechnology. 2 X 6 = 12M

3 from Environmental Biotechnology.

Short notes : 3 from Plant Biotechnology . 5 X 3 = 15M

3 from Environmental Biotechnology.

Essay questions : With choice 12 X 4 = 48M

3 from - Plant Biotechnology - Unit I & Unit II

3 from - Environmental Biotechnology - Unit I & Unit II

BLUE PRINT

Name of the Unit	**No. of very short Answers**	**No . of Short answers**	**No. of Essays**	**Weightage of Marks**
Plant Biotechnology Unit – I Unit – II	3	3	3	3x2=06 3x5=15 3x12=36

Environmental Biotechnology Unit - I Unit - II	3	3	3	3x2=06 3x5=15 3x12=36

Members:

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GOVERNMENT COLLEGE (AUTONOMOUS), RAJAHMUNDRY
III B.Sc., Biotechnology Paper – IV (At the end of VI Semester)
APPLICATIONS OF BIOTECHNOLOGY
Model Question Paper –MAR/APR – 2015

Time : 3 hrs Max . Marks : 75
Note : Draw Diagrams wherever necessary.

SECTION – A

Answer *ALL* of the following Questions. 6 X 2 = 12M

1. Callus
2. Auxins
3. Ti Plasmid
4. Biogas
5. Leaching
6. Effluent

SECTION – B

Write Short notes on any *THREE* of the following. 3 X 5 = 15M

7.Induction of callus.
8. Micro projectile bombardment.
9.Batch and continuous culture.
10.Bioethanol production.
11.Biofertilizers.
12.Bioinsecticides.

SECTION – C

Answer any *FOUR* of the following choosing at least two Questions from Part – A & Part – B. 4 X 12 = 48M

PART – A

13. Give a brief account on plant tissue culture media composition and its sterilization.
14. Write about Agro bacterium mediated gene transfer technique.
15. Applications of r-DNA technology in agriculture.

PART – B

16. Write an essay on renewable and non-renewable energy resources.
17. Write an essay on Microbial treatment of Municipal and industrial effluents.
18. Write about Bioremediation.

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GOVERNMENT COLLEGE (A), RAJAHMUNDRY.

III B.Sc BIOTECHNOLOGY

Paper-III Molecular Biology,Genetic Engineering and Immunology

Practical Syllabus - 2014-2015

(At the end of VI Semester)

1. Isolation of DNA from Plant/Animal/Bacterial cells
2. Analysis of DNA by Agarose gel electrophoresis
3. Restriction digestion of DNA
4. Immuno-diffusion test
5. ELISA Test
6. Microagglutination using microtiter plates(eg:ABO and Rh Blood grouping)
7. Viability tests of cells/bacteria(Evans blue test or Trypan blue test)
8. Coomb's test
9. Preparation of competent cells of Bacteria
10. Bacterial transformation and selection of transformants under pressure (antibiotic)

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.

III B.Sc BIOTECHNOLOGY

Paper-III Molecular Biology,Genetic Engineering and Immunology

Practical Model Paper - 2014-2015

(At the end of VI Semester)

Time – 3 hrs **Max. Marks: 75**

1. Perform micro agglutination test using Micro titer plates and determine the blood group of a given blood sample. - 20 M

2. Isolation of DNA from bacterial cells - 15M

3. Identify and write about the given spotters (5X5) - 25M

4. Record & viva voce - 15M

Total 75 M

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.

III B.Sc BIOTECHNOLOGY

Paper-IV – Applications of Biotechnology

Practical Syllabus - 2014-2015

(At the end of VI Semester)

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. Production of Wine using common yeast
5. Production of hydrogen or biogas using cow/cattle dung
6. Isolation of microbes from soil or industrial effluents
7. Preparation of Media and culture of animal cells/tissues
8. Cell disaggregation and cell counting
9. Cytotoxicity of the cells using the dye MTT method
10. Estimation of BOD in water samples
11. Production of alcohol by fermentation and estimation of alcohol by colorimetry
12. Production of Biofertilizers(Azolla)
13. Growth curves of bacteria, Measurement of growth in liquid cultures
14. Quality testing of Milk by MBRT

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.

III B.Sc BIOTECHNOLOGY

Paper-IV Applications of Biotechnology

Practical Model Paper - 2014-2015

(At the end of VI Semester)

Time – 3 hrs Max. Marks: 75

1. Estimation of BOD in water samples - 20M

2. Quality testing of Milk by MBRT - 15M

3. Identify and write about the given spotters (5X5) -15M

4. Record & viva voce - 15M

Total 75M

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.

I B.Sc BIOTECHNOLOGY

PAPER I -- CELL BIOLOGY, GENETICS, MICRO BIOLOGY

Practical Syllabus - 2014-2015 (90hrs)

(At the end of II Semester)

1. Monohybrid and Dihybrid ratio in Drosophila/Maize
2. Estimation of DNA by Diphenylamine method
3. Estimation of RNA by orcinol method
4. Preparation of different stages of Mitosis and Meiosis
5. Types of Chromosomes
6. Preparation of Normal, Molar and Molal solutions
7. Preparation of buffers (Acidic, Neutral and Alkaline buffers)
8. Technique of Micrometry (Stage and ocular)

9. Preparation of routine microbiological media
10. Isolation of common non-pathogenic bacteria
11. Staining and identification of bacteria –*E. coli, Pseudomonas, Bacillus and Staphylococcus*

GOVERNMENT COLLEGE (A), RAJAHMUNDRY.

I B.Sc BIOTECHNOLOGY PAPER I -- CELL BIOLOGY , GENETICS and MICRO BIOLOGY

Practical Model Paper - 2014-2015 (At the end of II Semester)

Time – 3 hrs Max. Marks: 75

1. Estimate the amount of DNA present in the given sample by constructing a standard graph using diphenylamine reagent. 20 M

2. Problem on Monohybrid and Dihybrid ratio in Drosophila/Maize. 15M

(or)

Prepare nutrient agar media for bacterial growth. 15 M

3.Spotters (5x5) 25M

4. Record & Viva-voce 15 M

Total 75 M

Members:

1. 2. 3.