

**PITHAPUR RAJAH'S GOVERNMENT COLLEGE
(AUTONOMOUS)
KAKINADA**
(Affiliated to Adikavi Nannaya University)



BOARD OF STUDIES

**DEPARTMENT OF
BIOCHEMISTRY
(2022-23)**

(CHOICEBASEDCREDITSYSTEM)

**P.R. GOVT. COLLEGE (AUTONOMOUS) KAKINADA.
2022-23, BOARD OF STUDIES MEETING .
DEPARTMENT OF BIOCHEMISTRY**

The members present have discussed the syllabus and model question papers (Theory and Practical) related to I to VI semesters in Biochemistry and made the following Resolutions.

- Resolution I:** Resolved to continue CBCS System as instructed by Commissioner of Collegiate Education) CCE, Vijayawada.
- Resolution II:** : Resolved to implement 50% external and 50% internal marks for admitted batch 2021 and 60% external and 40% internal marks for admitted batch prior to 2021 both theory and practical's from the academic year 2021 – 22
- Resolution III:** Resolved to reduce 40 marks of Theory internal to 20 marks for mid exams and 20 marks for co-curricular activities (Seminar / Assignment / Quiz / Group Discussion) and reduce 50 marks of theory internal to 25 marks for mid exams and 25 marks for co-curricular activities (Seminar / Assignment / Quiz / Group Discussion).
- Resolution IV:** Resolved to conduct Practical Examination also at the end of each semester even for I year II year students.
- Resolution V:** Resolved to follow the same syllabus and exam pattern for the coming II- and III-year students.
- Resolution VI :** Resolved to follow the same syllabus for I year in to be prescribed by APSCHE in the near future.
- Resolution VII :** Resolved to continue two subject electives (Advanced electives) in the V semester Paper 6 Molecular biology and recombinant DNA technology
- Resolution VIII :** Resolved to continue two subject electives (Advanced electives) in the V semester paper 7 Biochemical co-relation disorders.
- Resolution IX:** Resolved to encourage the students to enroll MOOCS Online courses.
- Resolution X:** Resolved to continue the same paper setters and examiners for all the semesters.
- Resolution XI:** Resolved to include Blue Prints for model question papers for all semesters.

**Chairperson
Board of Studies
Dept. of Biochemistry**

**PROCEEDINGS OF THE PRINCIPAL, P.R.GOVERNMENT COLLEGE(A),
KAKINADA-A.P**

Present : Dr. B.V.Tirupanyam, M.Sc; Ph.D.


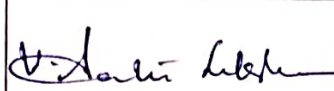
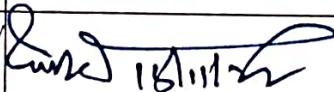
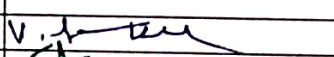

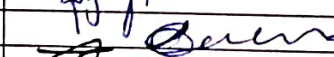

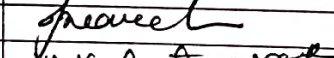
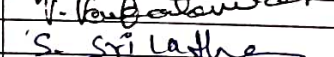
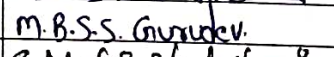
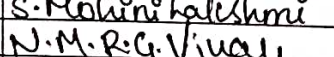
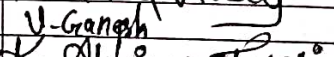
R.C.No.12A/A.C./BOS/2022-23, Dated:24.09.2022

SUB: P.R. Government College(A), Kakinada-UG Board of Studies (BOS)-
Program/Course-B.Sc./Biochemistry, Nomination of Members-Orders issued.

REF: 1. UGC Guidelines of for Autonomous Colleges-2018.


ORDERS:

The Principal, P.R. Government College(A), Kakinada is pleased to constitute UG Boards of Studies in Biochemistry for framing the syllabi in Biochemistry Subject for all Semesters duly following the norms of the UGC Autonomous guidelines.

S. No	Name of the Nominee	Designation	signature
1	Dr.D.ChennaRao	Chairman	
2	Smt. M. Suvarchala	University Nominee Lecturer in Home science A S D Govt. Degree College(Autonomous), Kakinada.	M. Suvarchala
3	Smt .V .Ananthalakshmi	Subject Expert Lecturer in Chemistry Govt .Degree College, Pithapuram.	
4	Sri. V. Mallikarjunasarma	Subject Expert Lecturer in chemistry ASD Govt. Degree College (Autonomous), Kakinada..	
5	V. SanjeevaKumar	Member	
6	T. V. V. Satya Narayana	Member	
7	P. VijayKumar	Member	
8	V. Rambabu	Member	
9	G. Pavani	Member	
10	Dr. N. Bujji Babu	Member	
11	Dr. Ch. Praveen	Member	
12	V. Venkateswara Rao	Member	
13	S. Srilatha	Member	
14	M. B. S. S.Gurdev	Student Alumini member	M. B. S. S. Gurudev.
15	S. Mohini lakshmi(IIFBC)	Student Member	S. Mohini lakshmi
16	N. M. R. G. Vinay(IIFBC)	Student Member	N. M. R. G. Vinay
17	V. Ganesh(IFBC)	Student Member	V. Ganesh
18	K. Abhinayatulasi(IFBC)	Student Member	K. Abhinaya Tulasi.

The above members are requested to attend the BOS meeting on -10-2022 and share their valuable reviews, and suggestions on the following functionaries.

- Prepare syllabi for the subject keeping in view the objectives of the college, interest of the stakeholders and National requirement for consideration and approval of the IQAC and Academic Council.
- Suggested methodologies for innovative teaching and evaluation techniques.
- Suggest the panel of Name to the academic council for appointment of Examiners.
- Coordinate research, teaching, extension and other activities in the Department of the college.


PRINCIPAL
P.R. Government College(A), Kakinada

VISION AND MISSION OF THE COLLEGE:

Vision

To provide the right academic environment paving way for intellectual excellence, humane feelings and social commitment. The college believes in providing quality education for the socially disadvantaged, economically weaker sections of the society and thereby help them move up the ladder of success and social order.

Mission

- To impart holistic education with special emphasis on character, culture, updated knowledge and skill oriented learning.
- To make the students enjoy the fruits of globalization without prejudice to their local and cultural environment.
- To impart necessary life skills so as to make them face any challenge in the bigger world – Social, ethical, psychological or professional

P.R.GOV.T.COLLEGE(AUTONOMOUS)KAKINADA
DEPARTEMENT OF BIOCHEMISTRY AND FOOD SCIENCE
BOARD OF STUDIES MEETING IN BIOCHEMISTRY
2022-2023
LIST OF EXAMINERS

S.No	Name of the Examiner	Subject	Name of the College
1	D. Kalyani	Assistant professor in Biosciences	Adikavi Nannaya University RAJAHMAHENDRAVARM.
2	Dr. P. Jyothi Kumari	Lecturer in Biosciences	St. Theresa Degree College, Eluru.
3	Dr. Srirangam	Lecturer in Food Technology	Layola College Vijayawada.
4	G. V. Sowmya	Lecturer in Biosciences	Dr. V.S. Krishna Degree College, Visakhapatnam.
5	Dr. Sandeep	Assistant Professor in Biosciences	Gitam University, Visakhapatnam.

ACTION PLAN BOS MEETING-BIO CHEMISTRY HELD ON 10-10-2022.

Department activities for the academic year 2022-2023.

Organizing National/ State level seminars/Workshops/ Conferences/ Training Programmes etc., with topics and other details.

(Mandatory for each Department)

- i) National Science Day- Last week of February
- ii) Guest Lectures
- iii) Biochemists 'Day- Third week of March
- iv) World Blood Donor Day-Second week of June
- v) DNA Day-Third week of April
- vi) World Health Day- First week of April

P.R. GOVERNMENT COLLEGE(A),KAKINADA

Department of Biochemistry and Food Science

Objectives of Department of Biochemistry

- To acquaint students with various fields of Biochemistry and their applications.
- To acquaint students with concept of Cell Biology and Cytogenetics.
- To acquaint students with basic techniques in Staining and Sterilization.
- To understand the structure and biological functions of Carbohydrates, Amino Acids, Lipids and Nucleotides.
- To familiarize students with the various cells and organs of the immune system, Immune Effector Mechanisms and various Immuno techniques.
- To acquaint students with DNA Replication, Repair, gene expression and regulation.
- To gain awareness about different Types of Environmental Pollution and Related Issues

B.Sc Biochemistry, Food Science and Chemistry Course PROGRAMME OUTCOMES

For every degree program expectations are listed out by the institution under the Program Outcomes. For B.Sc Biochemistry, Food Science and Chemistry Stream the following are set as Program Outcomes.

P01 Knowledge and understanding of:

- Students will be able design, conduct experiments, analyze and interpret data for investigating problems in Biotechnology and allied fields.
- Describe how scientific methodologies are used to conduct experiments and develop products
- The students understood the concept of cell and their activities.

P02. Intellectual skills-be able to:

- Think logically and organize tasks into a structured form.
- Assimilate knowledge and ideas based on wide reading and through the internet.
- Transfer of appropriate knowledge and methods from one topic to another within the subject.
- Understand the evolving state of knowledge in a rapidly developing field.
- Construct and test hypothesis.
- Plan, conduct and write an important independent term project.

PO3. Practical skills:

- Understand the importance of laboratory security as it applies to working with hazardous chemicals, biohazards, recombinant material, and general biotechnology security precautions.
- Students will evaluate the accuracy of different types of measuring devices to accurately measure a solution. They will statistically analyze their data to determine the best measuring device to use data
- Characterize isolated DNA and RNA using agarose gel electrophoresis and analyze agarose gel
- Perform basic microbiological techniques such as sterile plating and isolation of single colonies, culturing bacteria in liquid broth.
- PCR amplify target genomic DNA and ligate into vector and transform bacteria with rDNA.

PO4. Transferable skills:

- Use of IT (word-processing, use of internet, statistical packages and databases).
- Communication of scientific ideas in writing and orally.
- Ability to work as part of a team.
- Ability to use library resources/Equipment.
- Time management.

PO5. Problem analysis

- Identify the taxonomic position of animals
- Design solutions from medicinal animals for health problems, disorders and disease of human beings / animals which meet the specified needs
- Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data,

PO6. Environment and sustainability:

- Understanding of the causes, types and control methods for Environmental Pollution.
- Application of different life forms in Environmental Remediation.

PO7. Ethics:

- Apply ethical principles and commit to environmental ethics and responsibilities and norms the environment

PO8. Individual and teamwork:

- Function effectively as an individual, and as a member or leader in diverse teams, and in multi-disciplinary settings.
- Elicit views of others, mediate disagreements and help reach conclusions in group settings

PO9. Communication:

- Communicate effectively on complex group activities and with society at large. Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language
Manage projects and in multidisciplinary environments.

PO10.CriticalThinking:

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

PO11.EffectiveCitizenship:

- Demonstrate empathetic social concern and equity can tread national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO12.Life-longlearning:

- Recognize the need for, and have the preparation and ability to engage in independent and life long learning in the broadest context of technological change.

Course outcomes**I Semester-Bio molecules**

The objective of this paper is to learn biological concepts, carbohydrates & their classification, Amino acids& their classification proteins& their classification and to learn about the structures and functions of carbohydrates, amino acids and proteins.

II Semester-Nucleic Acids and Biochemical Techniques

1. The objective of this paper is to learn nature of nucleotides, their physical and chemical properties and about porphyrins and their properties.
2. This course deals with the Biochemical techniques of chromatography, electrophoresis & Spectrophotometry of their principles and applications.

III Semester-Enzymology and Bioenergetics

- 1) This curriculum gives an opportunity to learn about Enzymes.
- 2) This also imparts knowledge about biological oxidation& their enzymes, mitochondrial electron transport chain, oxidative phosphorylation and about photo phosphorylation

Semester IV-Intermediary metabolism

1. This course aims at the biological energy transformations
2. This also imparts knowledge about metabolism of carbohydrates fatty acids Aminoacids, nucleicacids and In bornerrors.

Semester V-Physiology, Clinical Biochemistry and immunology

- 1.This gives an insight into the digestion, absorption of carbohydrates, protein and lipid. Transport of gases and endocrine system.
2. This is to provide knowledge to the students to learn about human nutrition concepts and disorders associated and vitamins and minerals.
3. To provide basic knowledge about organization of immune system and antibodies function and activity.

Semester V- Molecular biology and Recombinant DNA technology

1. This is to provide knowledge about protein synthesis & their events, regulation of gene expression
2. This is to provide knowledge to the students to learn about recombinant DNA technology

Semester VI-Basic Microbiology

1. This is to provide knowledge about development of microorganisms, development of microorganism
2. This also imparts knowledge about viruses, bacteria, protozoa, algae and fungi.

Semester VI- Biochemical correlation and disorders

1. This is to provide knowledge about disorders of endocrine glands-pituitary & thyroid gland.
2. This also imparts knowledge about protein malnutrition, disorders of vitamins & digestive system.
3. This also imparts knowledge about molecular biology blotting techniques and bioin

P.R.GOV.T.COLLEGE(AUTONOMOUS)KAKINADADEPARTMENTOFBIOCHEMISTRY
 BOARD OF STUDY MEETING 2022-23
 CHOICE BASED CREDIT SYSTEM FOR ADMITTED BATCH 2022-2023
 I YEAR FBC

YEAR	SEMESTER	PAPER	TITLE	No. of Hrs./ Week	No of credits	Evaluation		
						Internal	External	TOTAL
I	I	I	Bio molecules	4	2	50	50	100
			Practical- I	2	1	-	50	50
	II	II	Nucleic acid s and Biochemical Techniques	4	2	50	50	100
			Practical-II	2	1	-	50	50

P.R.GOV.T.COLLEGE(AUTONOMOUS)KAKINADA
DEPARTMENT OF BIOCHEMISTRY
BOARD OF STUDY MEETING 2022-23
CHOICE BASED CREDIT SYSTEM
ADMITTED BATCH2021-2023
II YEAR FBC

YEAR	SEMESTER	PAPER	TITLE	No. ofHrs./ Week	No of credits	Evaluation		
						Internal	External	TOTAL
II	III	III	Enzymology and bioenergetics	4	2	50	50	100
			Practical-III	2	1		50	50
	IV	IV	Intermediate metabolism	4	2	50	50	100
			Practical-IV	2	1		50	50
		V	Physiology, clinical Biochemistry and Immunology	4	2	50	50	100
			Practical- V	2	1		50	50

P.R.GOV.T.COLLEGE(AUTONOMOUS)KAKINADA

DEPARTMENTOFBIOCHEMISTRY

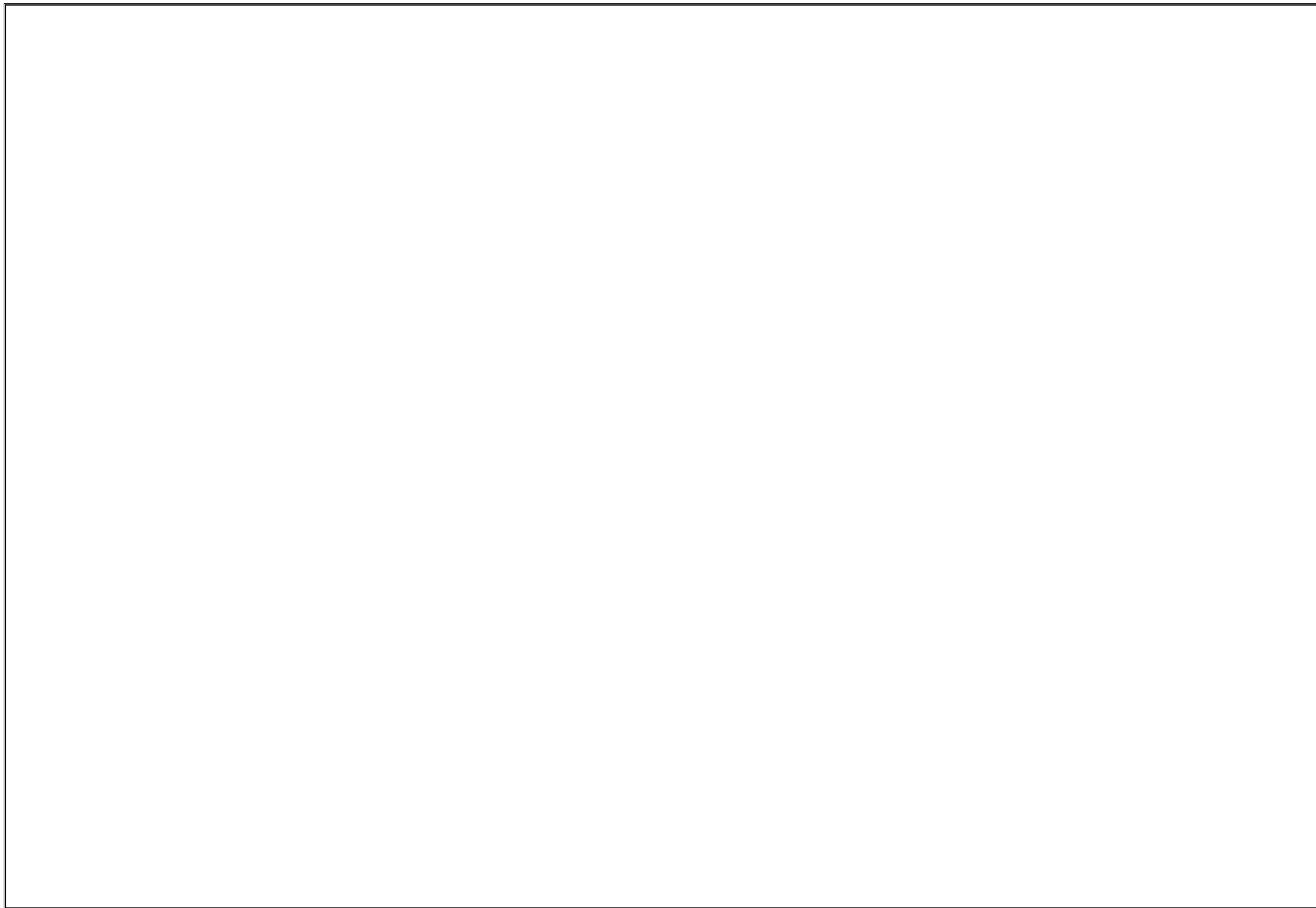
BOARD OF STUDY MEETING 2022-23

CHOICE BASED CREDIT SYSTEM

ADMITTED BATCH 2020-2023

IIIEAR FBC SEMESTER-V

YEAR	SEMESTER	PAPER	TITLE	No. of Hrs./ Week	No of credits	Evaluation		
						Internal	External	TOTAL
III	V	V	Molecular biology and Recombinant DNA Technology	3	4	40	60	100
			Practical- V	2	2	15	35	50
		VI	Biochemical correlation and Disorders	3	4	40	60	100
			Practical-VI	2	2	15	35	50




GUIDELINES FOR ALLOTMENT OF EXTRA CREDITS

S.No.	Activity	Details of achievement	Credits
1	MOOC Course	SWAYAM /NPTEL /CEC etc., (Course Completion certificate with credits should be produced for the claim of extra credits)	Total credits achieved will be considered
2	NCC	B CERTIFICATE	2
		Participation in National Camp after 'B' certificate	3
		C certificate	4
		Adventure camp/RD parade along with 'B'	5
		Failed in B certificate Examination	1
3	Sports	Inter collegiate election	2
		South zone selection	3
		All India participation	4
		Winning medals in all India competitions	5
4	NSS	40% attendance in regular NSS activities	1
		50% attendance with Community Service	2
		Conduct of survey/ Youth exchange/RD	3
5	JKC	Enrollment and training	1
		Campus recruitment local level	2
		MNCs/reputed companies	3
6	Community service	Participation in community service by departments (out reach Programmes)	2
7	Cultural Activity	Winning medals at state level-2,	2
		District level-1	1
8	COP/Add on Course	Pass in Certificate Exam-1,	1
		Diploma-2	2
9	Support services	Lead India, Health club, RC and Eco Club etc., participation in various Programmes	1

Details of Online courses proposed for the year 202223

S.No	Name of Online Course	Conducted by	No. of credits
1	Basic concepts of Enzymology	UGC	4
2	Human Genetics	UGC	4
3	Basics of Human Genetics	UGC	2
4	Human Nutrition and Biochemistry	UGC	4

	P.R.GOVERNMENTCOLL EGE(A),KAKINADA	Program & Semester IBSC(FBC) BIOCHEMISTRY (I Semester)						
	COURSE CODE	TITLE OF THE COURSE BIOMOLECULES						
Teaching	Hours Allocated: 60 (Theory)				L	T	P	C
Pre-requisites	this paper is to learn Biological concepts, carbohydrates Amino acids proteins & the structures and functions of carbohydrates, amino acids and proteins.				-	4	-	3

Course Objectives:

Upon completion of this course the student should be able to:

The objective of this paper is to learn Biological concepts,

To learn about the carbohydrates & their classification,

To learn about the Amino acids & their classification proteins & Their classification

To learn about the structures and functions of carbohydrates, amino acids and proteins.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	To know and learn Biological concepts,
CO2	To learn about the carbohydrates & their classification,
CO3	To learn about the Amino acids & their classification proteins & Their classification
CO4	To learn about the structures and functions of carbohydrates, amino acids and proteins.

Course with focus on employability /entrepreneurship/ Skill Development modules

Skill Development		Employability		Entrepreneurship
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P.R. GOVERNMENT COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
BIOCHEMISTRY SYLLABUS SEMESTER – I PAPER-I
BIOMOLECULES-I
ADMITTED BATCH 2022-2023 (COURSECODE–BC1212)

Hrs:60

CREDITS-2

Syllabus:

Unit–I: Biophysical Concepts

12hours

Water as a biological solvent and its role in biological processes. Biological relevance of pH, measurement of pH, PKa of functional groups in biopolymers such as proteins and nucleic acids. Importance of buffers in biological systems, ion selective electrodes, and oxygen electrode. Donnan membrane equilibrium. Significance of osmotic pressure in biological systems

Unit–II: Carbohydrates 12hours

Carbohydrates: Classification, monosaccharide ,D and L designation, open chain and cyclic structures, epimers and anomers, mutarotation, reactions of carbohydrates (due to functional groups - hydroxyl , aldehyde and ketone). Aminosugars, Glycosides. Structure and biological importance of disaccharides (sucrose, lactose, maltose, isomaltose, trehalose), trisaccharides (raffinose, melezitose), structural polysaccharides (cellulose, chitin, pectin) and storage polysaccharides (starch, inulin, glycogen).

UnitIII:Lipids

12hours

Lipids: Classification, saturated and unsaturated fatty acids, structure and properties of fats and oils (acid, saponification and iodine values, rancidity). General properties and structures of phospholipids, sphingo lipids and cholesterol and lipoproteins, Bio membranes: Behavior of amphipathic lipids in water-formation of micelles, bilayers, vesicles, liposomes. Membrane composition and organization–Fluid mosaic model.

Unit-IV: Amino acids, Peptides

12hours

Amino Acids: Classification, structure, stereochemistry, chemical reactions of amino acids due to carbonyl and aminogroups. Titration curve of glycine and pKa values. Essential and non-essential amino acids, non-protein amino acids. Peptide bond-nature and conformation. Naturally occurring peptides– glutathione, enkephalin

UNIT-V: Protenis

12 hours

Proteins: Classification based on solubility, shape and function. General properties of proteins, denaturation and renaturation of proteins. Structural organization of proteins-primary, secondary, tertiary and quaternary structures(Eg.Hemoglobin,,Myoglobin)

Textbooks:

General Biochemistry

1. Leininger's Principles of Biochemistry–Nelson.D.L.andCox.M.M.,Freeman&Co.
2. Biochemistry–Berg.J.M., Tymoczko.J.L. and Stryer. L.,Freeman &Co.
3. Biochemistry–Voet. D and Voet.,J.G.,JohnWiley&Sons.
4. TextbookofBiochemistry–West.E.S.,Todd.W.R,Mason.H.S..and.Bruggen,J.T.V.,Oxford

&IBH Publishers.

5. Fundamentals of Biochemistry–Jain ,J.L.,Jain,S. ,Jain,N.S.Chand &Co.
6. Biochemistry–Satyanarayana. U and Chakrapani. U, Books & Allied Pvt. Ltd.
7. Biochemistry–RamaRao.A, Ratna Kumari. D,Kalyani- Publishers.

Referencebooks:

I

Fundamentals of Biochemistry–Jain, J.L., Jain,S.,Jain,N.

S.Chand&Co.Biochemistry–

Satyanarayana.UandChakrapani.U,Books&AlliedPvt.Ltd.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	2	3	2	3	3	3	1	2	2	3	2	3	3
CO2	3	2	3	3	2	3	3	1	3	3	2	3	2
CO3	3	3	3	3	2	2	2	2	2	3	3	3	2
CO4	3	2	2	2	2	2	3	3	1	1	3	3	3

P.R. GOVERNMENT COLLEGE (A),KAKINADA

FIRSTYEAR

CHOCIE BASEDCREDITSYSTEMSEMESTER-I

PAPER-I BIOMOLECULES-I

ADMITTED BATCH2022-2023

BLUEPRINTFORQUESTIONPAPERSETTER

Time:2.30 hours

Maxmarks:50

MODULENO.	ESSAY QUESTIONS 10MARKS	SHORT ANSWER QUESTIONS 5MARKS	MARKS ALLOTD TOTHE UNIT	As per blooms taxonomy
UNIT-I	01	01	20	Evaluating Understanding
UNIT-II	01	02	20	Analyzing
UNIT-III	01	02	15	Understanding
UNIT-IV	02	01	25	Remembering Applying
UNIT-V	01	01	15	Evaluating Understanding
Total no of questions	06	07	95	

NOTE: The question paper setters are requested to kindly adhere to the format given in the above table

**P.R.GOVERNMENT
COLLEGE(A),KAKINADA
B.sc(BIOCHEMISTRY)FIRSTYEARI
SEMESTER
Course-1:C**

Time2hrs

Max.Marks-50

**Note: Answer any THREE questions choosing atleast one question
from each Section**

3x10= 30M

SECTION-A

1. Explain the significance of osmotic pressure in biological system.
2. Describe the structure and biological importance of storage polysaccharides.
3. Describe the structure and properties of phospholipids.

SECTION-B

4. Describe various chemical reactions of amino acids
5. Describe the molecular structure of fluid mosaic model of plasma membrane.
6. Write the classification of proteins based on solubility.

PART-II

Answer any **Four** questions (Short answer questions)

4x5=20Marks

7. Donnan membrane equilibrium.
8. Structure and biological importance of Sucrose
9. Sphingo lipids
10. Essential and non essential amino acid
11. Denaturation of protein
12. Cholestrol
13. Amino sugars

P.R.GOVERNMENT COLLEGE(A),KAKINADA

B.SC(BIOCHEMISTRY)

FIRST YEAR SEMESTER

Course-1:BIOMOLECULES

QUESTION BANK

(Essay questions 10 marks)

EASY QUESTIONS (10 Marks)

Unit-I

1. Explain the significance of Osmotic pressure in biology.
2. Explain the Water as biological solvents and its role in biological Process
3. Explain the importance of buffers in biological system.

Unit-II

4. Write the classification of Carbohydrates.
5. Describe the structure and biological importance of storage Polysaccharides.
6. Describe the structure and biological importance of Structural polysaccharides.
7. Explain the various chemical reactions of Carbohydrates.

Unit-III

8. Write about the Classification of Lipids.
9. Describe the molecular structure of fluid mosaic model of Plasma membrane.
10. Explain the general properties and structures of phospholipids.

Unit-IV

11. Write about the Classification of Amino acids.
12. Explain the chemical reactions of Amino acids.(due to carbonyl and amino group)

Unit-V:

13. Describe the structural organization of Proteins.
14. Explain the classification of proteins.(Based on solubility, shape and functions)

SHORT ANSWER QUESTIONS(5Marks)

Unit-I

1. Donnan membrane equilibrium.
2. Biological relevance of pH
3. Oxygen electrode.
4. Measurements of pH, pKa

Unit-II

5. Structure and Biological importance of Sucrose.
6. Structure and Biological importance of maltose.
7. Structure and Biological importance of lactose.
8. Structure and Biological importance of trehalose
9. Amino sugars.
10. Glycosides.

Unit-III

11. Structure and properties of fats.
12. Lipoproteins.
13. Sphingolipids.
14. Cholesterol

Unit-IV

15. Titration curve of Glycine.
16. Essential amino acids and Non-essential amino acids
17. Naturally occurring peptides

Unit-V

18. Denaturation
19. Hemoglobin



P.R.GOVERNMENTCOLLEGE(A),KAKINADA

Program &Semester

IB.sc FBC
BIOCHEMISTRY
(I Semester)

Course
Code

TITLE OF THE COURSE
BIOMOLECULES-IPRACTICAL

Teaching

Hours Allocated:30(**Practical**)

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P

C

Pre-requisites

To learn the qualitative analysis of biomolecules

2

-

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2

List of Experiments:

1. Preparation of buffers (acidic, neutral and alkaline)and determination of pH.
- 2.Titration curve of glycine and determination of pK_a and pI values.
- 4.Qualitative identification of carbohydrates-glucose, fructose, ribose, maltose, sucrose, lactose, starch /glycogen.
Preparation of Osazones and their identification.
6. Qualitative identification of amino acids–Alanine, histidine, tyrosine, cysteine, glutamicacid.
7. Qualitative identification of lipids- solubility, saponification, acrolein test, Salkowski test, Acid number and Iodine number tests.

Recommended Books for UG Course-Biochemistry

General Biochemistry

1. Leininger'sPrinciplesofBiochemistry–Nelson.D.L.andCox.M.M.,Freeman&Co.
2. Biochemistry–Berg.J.M.,Tymoczko.J.L.andStryer.L.,Freeman&Co.
3. Biochemistry–Voet.DandVoet.,J.G.,JohnWiley&Sons.
4. TextbookofBiochemistry–West.E.S.,Todd.W.R,Mason.H.S..and.Bruggen,J.T.V.,Oxford
&IBHPublishers.
5. Fundamentals of Biochemistry–Jain,J.L.,Jain,S.,Jain,N.S.Chand&Co.
6. Biochemistry–Satyanarayana.U and Chakrapani.U, Books&AlliedPvt.Ltd.
7. Biochemistry–RamaRao.A,RatnaKumari.D,Kalyani-Publishers.

P.R GOVERNMENT COLLEGE(A),KAKINADA
SEMESTER-I BIOMOLECULES
PRACTICAL MODEL QUESTION PAPER

Time:11/2hrs.

Marks:50M

m

1 I. Qualitative test for Identification of amino acids

Principle and Procedure--	06Marks		
Conduct of Experiment	08Marks	20Marks	↕
Report	06Marks		


2. Titration curve of glycine and determination of pK_a and pI values.

Principle and Procedure	4Marks		
Conduct of Experiment	8Marks	15Marks	↕
Report	3Marks		

3. Practical Record 10Marks

4. Viva Voice 5Marks

TOTAL 50Marks

	P.R.GOVERNMENTCOLL EGE(A),KAKINADA	Program&Semester IB.SC(FBC)BIO CHEMISTRY (I Semester)			
CourseCode BC2212	TITLEOFTHECOURSE NUCLEICACIDSANDBIO CHEMICALTECHINQES				
Teaching	HoursAllocated:60(Theory)	L	T	P	C
Pre-requisites	To know a nucleotide structure and porphyrins To learn the different biochemical techniques	-	4	-	3

Course Objective




Upon completion of this course the student should be able to:

1. The objective of this paper is physical to learn nature of nucleotides, their and chemical properties and about porphyrins and their properties.
2. techniques This course deals with the Biochemical of chromatography, electrophoresis & Spectrophotometry of their principles and applications.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	To learn nature of nucleotides their and chemical properties
CO2	To learn about porphyrins and their properties
CO3	This course deals with the Biochemical of chromatography, electrophoresis
CO4	To learn Spectrophotometry of their principles and applications.

Course with focus on employability/entrepreneurship/Skill Development modules

Skill Development		Employability		Entrepreneurship	
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P.R.GOVERNMENT COLLEGE(A),KAKINADA
CHOICE BASED CREDIT SYSTEM
BIOCHEMISTRY SYLLABUS PAPER-II
NUCLEIC ACIDS AND BIOCHEMICAL TECHNIQUES
ADMITTED BATCH 2022-2023

Unit-I: Nucleic Acids

15 hours

Nature of nucleic acids. Structure of purines and pyrimidines, nucleosides, nucleotides. Stability and formation of phosphodiester linkages. Effect of acids, alkali and nucleases on DNA and RNA. Structure of Nucleicacids-Watson-Crick DNA double helix structure, introduction to circular DNA, super coiling, helix to random coil transition, denaturation of nucleic acids-hyperchromic effect. T_m values and their significance Reassociation kinetics cotcurves and their significance.\Types of RNA and DNA.

Unit-II: Porphyrins 6 Hours

Structure and types of porphyrins; Protoporphyrin, porphobilinogen properties Structure, properties & biological importance of metallo porphyrins–Heme. Cytocromes and chlorophylls

Unit-III: Biochemical Techniques I

15hours

Methods of tissue homogenization: (Potter-Elvehjem, mechanical blender, sonicator and enzymatic). Principle and applications of centrifugation techniques differential and density gradient Ultra centrifugation-preparative and analytical.

Principle and applications of chromatographic techniques- paper, thin layer, gel filtration ion exchange and affinity chromatography.

Unit-IV: Biochemical Techniques II

12hours

Electrophoresis- principles and applications Of paper, agarose gel electrophoresis - polyacralmide (native and SDS) tracer techniques : Introduction to Radioactivity Radio isotopes, units of radio activity, half life, β and γ -emitters, use of radio active isotopes in biology

Unit-V: Biochemical technique III

12hours

Spectrophotometry: Laws of light absorption -Beer-Lambert law, Instrumentation of UV and visible spectrophotometry, Applications of UV and visible spectrophotometry.
Colorimeter :Principles and its applications, Principle of fluorimetry

General Biochemistry

3. Leininger's Principles of Biochemistry–Nelson.D.L.andCox.M.M.,Freeman&Co.
4. Biochemistry–Berg.J.M.,Tymoczko.J.L.andStryer.L.,Freeman&Co.
3. Biochemistry–Voet.DandVoet.,J.G.,JohnWiley&Sons.
4. TextbookofBiochemistry–West.E.S.,Todd.W.R,Mason.H.S..and.Bruggen,J.T.V.,Oxford

&IBHPublishers.

Page | 15

5. Fundamentals of Biochemistry–Jain,J.L.,Jain,S.,Jain,N.S.Chand&Co.
10. Biochemistry–Satyanarayana.UandChakrapani.U,Books&AlliedPvt.Ltd.
11. Biochemistry–RamaRao.A,RatnaKumari.D,Kalyani-Publishers.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	2	3	2	3	3	3	1	2	2	3	2	3	3
CO2	3	2	3	3	2	3	3	1	3	3	2	3	2
CO3	3	3	3	3	2	2	2	2	2	3	3	3	2
CO4	3	2	2	2	2	2	3	3	1	1	3	3	3

P.R. GOVERNMENT COLLEGE(A),KAKINADA

B.sc (BIOCHEMISTRY) FIRSTYEAR

I SEMESTER

Weightage to content

**Course-2 NUCLEICACIDS AND
BIOCHEMICAL TECHNIQUES**

Time:2.30 hours

Maxmarks:50M

MODULENO.	ESSAYQUESTIONS10MARKS	SHORTANSWERQUESTION55MARKS	MARKSALLOTTEDTO THEUNIT	QUESTIONS RELATED AS PER BLOOMS TAXONOMY
UNIT- I	02	01	25	Analyzing understanding
UNIT-II	01	01	15	Skill evaluating
UNIT-III	01	02	20	Analyzing applying
UNIT-IV	01	02	20	Remembering applying
UNIT-V	01	01	15	Analyzing understanding
Total no. of Questions	06	07	95	

NOTE: The question paper setters are requested to kindly adhere to the format given in the above table.

P.R.GOVERNMENT COLLEGE(A),KAKINADA

B.SC(BIOCHEMISTRY)FIRSTYEAR

Course–NUCLEICACIDSANDBIOCHEMICALTECHNIQS

Model Question Paper

Time2hrs.

Max.Marks-50M

Note: Answer any THREE questions choosing atleast one question from each Section.3x10=30M

SECTION-A

1. Write the structure and properties of purine and pyrimidine nucleotides.
2. Write an account on Watson-Crick DNA double helix structure.
3. Explain the structure, properties and functions of heme.

SECTION-B

4. Write the principle and application of affinity chromatography.
5. Write an essay on applications of radio isotopes in biology.
6. Explain the applications of UV and Visible spectrophotometry.

PART-II

Answer any Four Questions.

4x5= 20M

1. Super coiling of DNA
2. Thin layer chromatography.
3. Applications of centrifugation.
4. Applications of Electrophoresis.
5. Trace techniques.
6. Heme
7. Principle of Fluorimetry.

P.R. GOVERNMENT COLLEGE(A),KAKINADA

B.SC(BIOCHEMISTRY)FIRSTYEARIS

EMESTER

Course-2:NUCLEIC ACIDS AND BIOCHEMICAL TECHNIQS

QUESTION BANK

EASY QUESTIONS (10Marks)

Unit-I

- 1.Explain the structure, properties and functions of heme.
- 2.Write the structure and properties of purine and pyrimidine nucleotides.
- 3.Write an account on Watson-Crick DNA double helix structure
- 4.Explain reassociation kinetics and cot curves and their significance

Unit-II

- 5.Explain the types and properties of Porphyrins.
- 6.Describe the structure, properties & biological importance of Metallo porphyrines

Unit-III

- 7.Write the principle and application of paper chromatography.
- 8.Write principle and application of affinity chromatography.
- 9.Explain the principal and applications of Centrifugation techniques.
- 10.Write an account on Analytical centrifugation
- 11.Write an account on Ultracentrifugation.
- 12.Explain the principal and application of gel filtration.

Unit-IV

- 13.Write an essay on applications of radio isotopes in biology.
- 14.Discuss about the principal and application of agarose gel electrophoresis.
- 15.Write an essay on principal and application of paper gel electrophoresis.

Unit-V

- 16.Explain the applications of UV and Visible spectrophotometry.
- 17.Explain the principal and application of Colorimetry
- 18.Describe about the instrumentation of UV and Visible spectrophotometry.

SHORT ANSWER QUESTIONS(5Marks)

Unit-I

1. Denaturation of Nucleic acids.
2. Super coiling DNA
3. Types of RNA.
4. Types of DNA.

Unit-II

5. Chlorophyll.
6. Hemoglobin

Unit-III

7. Methods of tissue homogenization.
7. Paper chromatography
8. Thin layer chromatography.


UNIT-IV

9. Tracer technique
10. Radioactive isotope
11. alpha and beta emitters

UNIT-V

12. Principles of fluorimetry
13. laws of light absorption
14. Visible spectrophotometry



	P.R.GOVERNMENT COLLEGE(A),KAKINADA	Program & Semester IB.sc(FBC)BI OCHEMISTRY (II Semester)			
Course Code BC2212P	TITLE OF THE COURSE NUCLEIC ACIDS AND BIOCHEMICAL TECHNIQUES PRACTICAL				
Teaching	Hours Allocated: 30(Practical)	L	T	P	C
Pre-requisites	To know about the biochemical techniques and to know the qualitative identification of DNA RNA Nitrogenous bases	2	-	-	2

Practicals:

COURSE CODE: BC2212P

Hrs: 2

List of Experiments:

1. Isolation of DNA from plants (Record with Demo)
2. Qualitative Identification of DNA, RNA and Nitrogen Bases
3. Isolation of egg albumin from egg white.
4. Isolation of cholesterol from egg yolk.
5. Isolation of starch from potatoes.
6. Isolation of casein from milk.
7. Separation of amino acids by paper chromatography.
8. Determination of exchange capacity of resin by titrimetry (Record with Demo)
9. Separation of proteins by Agarose electrophoresis. (Record with Demo)
10. Separation of plant pigments by TLC.

**P.R GOVERNMENT COLLEGE(A),
KAKINADA II SEMESTER BIOCHEMISTRY
Nucleic acids and Biochemical Techniques
BATCH2022-2023
MODEL PRACTICAL PAPER**

Time:1 1/2hrs.

Marks:50M

1. Separation of amino acids by paper chromatography.

Principle and Procedure--

06Marks

Conduct of Experiment

08Marks

20Marks

Report

06Marks



2. Isolation of casein from milk.

Principle and Procedure

4Marks

Conduct of

8Marks

Experiment Report

15Marks

3Marks




3. Practical Record

10Marks

4. Viva Voice

5Marks

	P.R.GOVERNMENTCOLL EGE(A),KAKINADA	Program&Semester IB.SC., BIOCHEMISTRY (III Semester)			
Course CodeBC3 212	TITLEOFTHECOURSE ENZYMOLGYANDBIOENERGETICS				
Teaching	HoursAllocated:60(Theory)	L	T	P	C
Pre-requisites	To learn about enzymes To impart the knowledge about biological oxidation	-	4	-	3

CourseObjectives:

To make the student

1. This curriculum gives an opportunity to learn about Enzymes.
2. This also imparts knowledge about Biological oxidation & their enzymes, mitochondrial electron transport chain, oxidative phosphorylation and about photo phosphorylation

On Completion of the course, the students will be able to

CO1	To learn about enzymes and their properties function and their activity
CO2	To know the mechanism of enzyme action
CO3	To understand the concept of bio energetics
CO4	To know the biological oxidation of mitochondria

Course with focus on employability /entrepreneurship /Skill Development modules

Skill Development		Employability		Entrepreneurship	
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CO-PO Mapping:

(1:Slig ht[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	2	3	2	3	3	3	1	2	2	3	2	3	3
CO2	3	2	3	3	2	3	3	1	3	3	2	3	2
CO3	3	3	3	3	2	2	2	2	2	3	3	3	2
CO4	3	2	2	2	2	2	3	3	1	1	3	3	3

P.R.G

P.R. GOVERNMENT COLLEGE(A), KAKINADA

B.SC(FBC) BIOCHEMISTRY

SECONDYEAR SEMESTER-III

COURSE-3 : ENZYMOLOGY AND BIOENERGETICS

WEIGHTAGE TO CONTENT

Time:2hours

Maxmarks:50

MODULENO.	ESSAY QUESTIONS 10MARKS	SHORTANSWE RQUESTIONS5 MARKS	MARKSAL LOTE D TO THE UNIT	AS PER BOOLMS TAXONOMY
aUNIT- I	03	02	40	Analyzing a understanding
UNIT-II	01	02	20	Creating applying
UNIT-III	01	01	15	remembering
UNIT-IV	01	02	20	understanding
Total no.of Questions	06	07	95	

NOTE : The question paper setters are requested to kindly adhere to the format given in the above table.

P.R.GOVERNMENT COLLEGE(A),KAKINADA

B.SC (FBC) BIO CHEMISTRY SECOND YEAR

III SEMESTER

Course—:ENZYMOLGY AND BIOENERGETICS

Model Question Paper

Time:2hrs.

Marks:50M

PART-I

Note : Answer any THREE questions choosing at least one question from each Section. 10x3 =30

SECTION-A

1. Write the factors affecting the enzyme catalysis.
2. Write an account one Enzyme classification.
3. Write an essay on enzyme inhibition.

SECTION-B

4. Explain about the Mechanism of Acid –Base catalysis
5. Discuss about the High energy compounds.
6. Write an account on mitochondrial electron transport chain.

PART-II

Answer any **Four** questions.

4x5=20Marks

7. Enzyme specificity and active site
8. Lock and key mechanism of enzyme substrate reaction
9. Multi enzyme complex (PDH)
10. Metal ion catalysis.
11. Oxidation and reduction reaction
12. Oxidative phosphorylation.
13. Mitochondria.

PRGOVERNMENTCOLLEGE

III-SEMESTER II B.SC(FBC)

BIOCHEMISTRY

PAPER -: ENZYMOLOGY AND BIO ENERGETICS

QUESTIOIN BANK

Essay questions (10M)

EASY QUESTIONS (10Marks)

Unit-I

1. Write an essay on enzyme inhibition.
2. Write the factors affecting the enzyme catalysis.
3. Write an account on enzyme classification.
4. Explain the lock and key induced fit model.
5. Write about the differences between chemical and biochemical catalysis.

Unit-II

6. Explain about the Mechanism of Acid-base catalysis.
7. Explain about the Multi-enzyme complex.
8. Write about the Metal ion catalysis.

Unit-III

9. Write about the Thermodynamics principles.
10. Discuss about the High energy compounds.
11. Explain about the free energy changes in biological

Transformation in living system

Unit-IV

12. Explain about the mitochondrial electron transport chain.
13. Explain about the Mechanism of Oxidative phosphorylation.

SHORT ANSWER QUESTIONS(5Marks)

Unit-I

1. Michael's-menten equation.
2. Competitive inhibition
3. Enzyme sppecificity
4. Bio catalysis.
5. Fundamentals of enzyme assay

Unit-II

6. Iso enzyme(LDH)
7. Activation of trypsinogen
8. Electrostatic catalysis
9. Covalent catalysis.

Unit-III

10. Oxidation reduction reactions
11. Free energy

Unit-IV

12. Oxidative phosphorylation.
13. Inhibitors of oxidative phosphorylation
14. Inhibitors of electron transport chain

P.R GOVERNMENT COLLEGE (A) ,KAKINADA
CHOICEBASED CREDIT SYSTEM
IIB.Sc. BIOCHEMISTRY IIISEMESTER PAPER-III PRACTICALS
ENZYMOLGY AND BIOPHYSICAL TECHNIQUES
ADMITTED BATCH 2021-2022

List of Experiments:

CREDITS-1

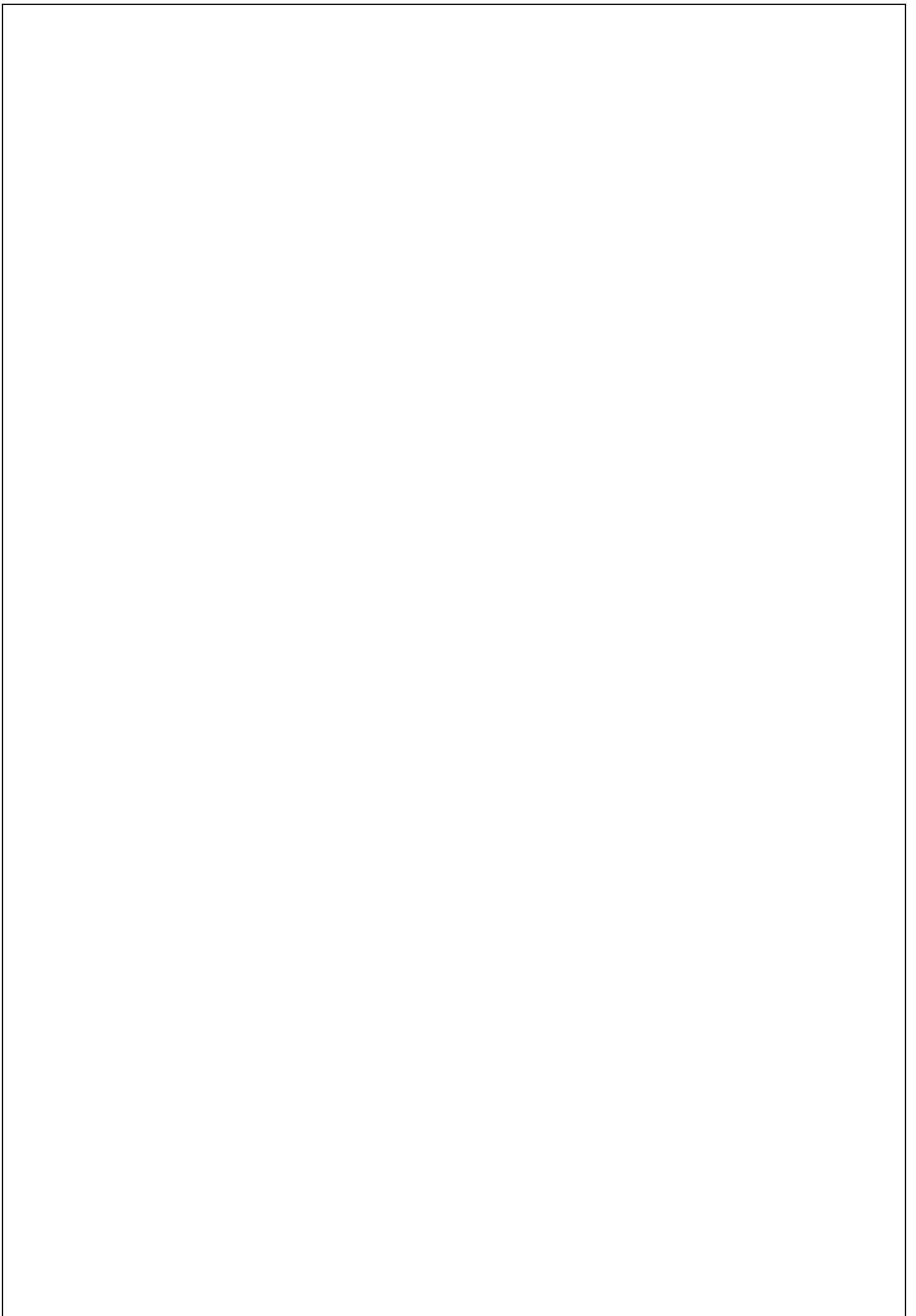
1. Assay of amylase
2. Assay of urease
3. Assay of catalase.
4. Assay of phosphatase
5. Determination of optimum temperature for amylase.
6. Determination of optimum pH for phosphatase

Recommended books for Enzymology & Bioenergetics

1. Fundamentals of Enzymology—Price .N.C. and Stevens.L., Oxford University Press.
2. Understanding Enzymes—Palmer.T., Ellis Harwood.
3. Enzymes—Biochemistry, Biotechnology, Clinical Chemistry—Palmer.T., Affiliated East-West Press.
4. Lehninger's Principles of Biochemistry—Nelson.D.L. and Cox.M.M., Freeman & Co.
5. Biochemistry—Berg.J.M., Tymoczko.J.L. and Stryer.L., Freeman & Co.
6. Biochemistry—Voet.D and Voet., J.G., John Wiley & Sons







P.R.GOVERNMENTCOLLEGE(A),KAKINADA

AT THE III SEMESTER

ENZYMOLGY AND BIO ENERGITICS

MODEL PRACTICAL PAPER

Time:11/2hrs.

Marks:50M

1.Assay of Amylase.

Principle and Procedure--

06Marks

Conduct of Experiment

08Marks

20Marks



Report

06Marks

2.Determination of optimum temperature for Amylase.

Principle and Procedure

4marks

Conduct of Experiment

8 Marks

15Marks



Report

4marks

3. Practical Record

10Marks


4. Viva Voice

5Marks

TOTAL

50 Marks



	P.R.GOVERNMENTCOLL EGE(A),KAKINADA	Program &Semester IIB.SC, BIOCHEMISTRY (IV Semester)			
CourseCode 4212	TITLEOFTHECOURSE INTERMEDIARYMETABOLISM				
Teaching	HoursAllocated:60(Theory)	L	T	P	C
Pre-requisites	TOUNDRSTANDTHEBIOLOGICALT RANSFORMATION	-	4	-	3

Course Objectives:

After the successful completion of this course, the student shall be able to:

1. This course aims at the biological energy transformations
2. This also imparts knowledge about metabolism of carbohydrates fatty acids aminoacids ,nucleicacids and In bornerrors.

OnCompletionofthecourse,thestudentwillbeableto	
CO1	This course aims at the biological energy transformations
CO2	To impart the knowledge about the metabolism of carbohydrates fattyacids
CO3	To understand and learn about the metabolism of amino acids
CO4	To learn about the nucleotide metabolism
CO5	Tolean about the various in born errors of different metabolism

SkillDev elopment		Employability		Entrepreneurship	
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**P.R.GOVERNMENT COLLEGE(A),
KAKINADA
CHOICE BASED CREDIT SYSTEM
BIOCHEMISTRY SYLLABUS IV SEMESTER PAPER-IV
INTERMEDIARY METABOLISM
ADMITTED BATCH 2020-2021**

COURSECODE–BC4212

Hrs :

CREDITS-2

INSTRUCTIONAL OBJECTIVES:

1.This course aims at the biological energy transformations

2.This also imparts knowledge about metabolism of carbohydrates fatty acids amino acids, nucleic acids and Inborn errors.

Unit-I: Carbohydrate Metabolism and Lipid metabolism

24hours

Concept of anabolism and catabolism. Glycolytic pathway, energy yield. Fate of pyruvate-formation of lactate, Pasteur effect. Citric acid cycle, regulation, energy yield, amphipathicrole. .Photosynthesis-Light and Dark reactions.

Catabolism of fatty acids (β -oxidation) with even and odd number of carbon atoms, Keto genesis.

Bio synthesis of fatty acids.

Unit-II: Metabolism of Amino acids

12hours

General reactions of amino acid metabolism -transamination, decarboxylation and deamination, Urea cycle and regulation, glycogenic and ketogenic amino acids. Metabolism of glycine, Biosynthesis of creatine

Unit-III: Metabolism of Nucleic acid, heme.

12hours

Biosynthesis and regulation of Purine and Pyrimidine nucleotides ,*denovo* and salvage pathways. Catabolism of purines and pyrimidines. Bio synthesis of Deoxy ribonucleotides - Ribonucleotide..

Unit-IV: Integration and Inborn Errors of Metabolism:

12hours

Disorders of carbohydrate Metabolism: hypoglycemias, hyperglycemia, glycosuria. *Diabetes mellitus* -classification, glucose tolerance test(GTT).

Disorders of Amino acid metabolism: Phenylketonuria, Alkaptonuria, Maple syrup urine disease (MSUD). Disorders of nucleotide metabolism - Gout, Lesch – Nyhan syndrome, Reye syndrome

Disorders of Lipid Metabolism: lipoproteinemias, hypercholesterolemia, atherosclerosis

Recommended Books for Intermediary Metabolisms

1. Lehninger's Principles of Biochemistry – Nelson.D.L.andCox.M.M.,Freeman&Co.
2. Biochemistry–Berg.J.M.,Tymoczko .J.L. and Stryer. L.,Freeman&Co.
3. Biochemistry–Voet.DandVoet.,J.G.,JohnWiley&Sons
4. Biochemistry-Lippincott'sIllustratedReviews.Champe,P.C.andHarvey,R.A.Lippincott
5. FundamentalsofBiochemistry–Jain,J.L.,Jain,S.,Jain,N.S.Chand&Co.
6. Biochemistry–Satyanarayana.UandChakrapani.U,Books&AlliedPvt.Ltd.
7. Biochemistry–Rama Rao. A and Ratna Kumari. D, Kalyani Publishers. Harpers –
BiochemistryStrayer–Biochemistry

CO-POMapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	2	3	2	3	3	3	1	2	2	3	2	3	3
CO2	3	2	3	3	2	3	3	1	3	3	2	3	2
CO3	3	3	3	3	2	2	2	2	2	3	3	3	2
CO4	3	2	2	2	2	2	3	3	1	1	3	3	3



P.R.GOVERNMENTCOLLEGE(A),KAKINADA

B.SC(FBC)BIOCHEMISTRY

SECOND YEAR SEMESTER-IV
COURSE-INTERMEDIARY METABOLISM

WEIGHTAGETOCONTENT

BLUEPRINTFORQUESTIONPAPERSETTER

Time:2hours

Maxmarks

MODULENO.	ESSAY QUESTIONS 10MARKS	SHORT ANSWER QUESTIONS5 MARKS	MARKS ALLOTTEDTO THEUNIT	AS PER BLOOMS TAXONMY	
UNIT-I	02	01	25	Evaluating	
UNIT-II	01	02	20	analyzing	
UNIT-III	02	02	30	Evaluating analyzing	
UNIT-IV	01	02	20	Understanding and remembering	
	06	07	95		

NOTE:The questionpapers etters are requested to kindlyadheretotheformat givenintheabove table.

P.R.GOVERNMENT COLLEGE(A),KAKINADA

B.SC(FBC)

BIOCHEMISTRY

SECONDYEAR IV SEMESTER

Course-INTERMEDIARY METABOLISM

Model Question Paper

. Time 2hrs

Max.Marks-50M

PART-1

Note: Answer any THREE questions choosing at least one question from each Section.

10x3=30M

SECTION-A

1. Write an essay on urea cycle and its regulation
2. Explain about the Photosynthesis-Light and Dark
3. Describe citric acid cycle and its regulation

SECTION-B

4. Explain the catabolism of purines.
5. Explain the biosynthesis of purines by denovo pathway.
6. Give a detailed account Disorders of nucleotide metabolism.

PART-II

Answer any **FIVE** questions.

5x4=20

0Marks

7. Gluconeogenesis
8. Glycogenic and ketogenic amino acids.
9. Biosynthesis of creatine.
10. Ribonucleotides synthesis.
11. Decarboxylation reaction of amino acid metabolism.
12. Lipoproteinemias,
13. Lesch-Nyhan syndrome.

P.R.GOVERNMENT COLLEGE(A),KAKINADA

B.SC(FBC) BIOCHEMISTRY

SECONDYEAR IV SEMESTER

Course-INTERMEDIARY METABOLISM

Question bank

ESSAY QUESTIONS(10 MARKS)

Unit-I

1. Describe the Citric acid cycle and its regulation?
2. Explain about the Photosynthesis-Light and Dark phase?
3. Write an essay on glycolysis
4. Explain about the Denovo synthesis of fatty acids?

Unit-II

5. Explain the General reactions of amino acid metabolism?
6. Write an essay on Urea cycle and its regulation?
7. Explain the Metabolism of Glycine?

Unit-III

8. Explain the bio synthesis of purine by denovo pathway?
9. Explain the bio synthesis of pyrimidine by denovo pathway?

Unit-IV

10. Give a detailed account on Disorders of nucleotide metabolism?
11. Explain the classification of Diabetes mellitus?
12. Explain the disorders of Lipid metabolism

SHORT ANSWER QUESTIONS(5Marks)

Unit-I

1. Light reaction
2. Dark reaction
3. Glycolytic pathway?
4. β Oxidation of fatty acids?

Unit-II

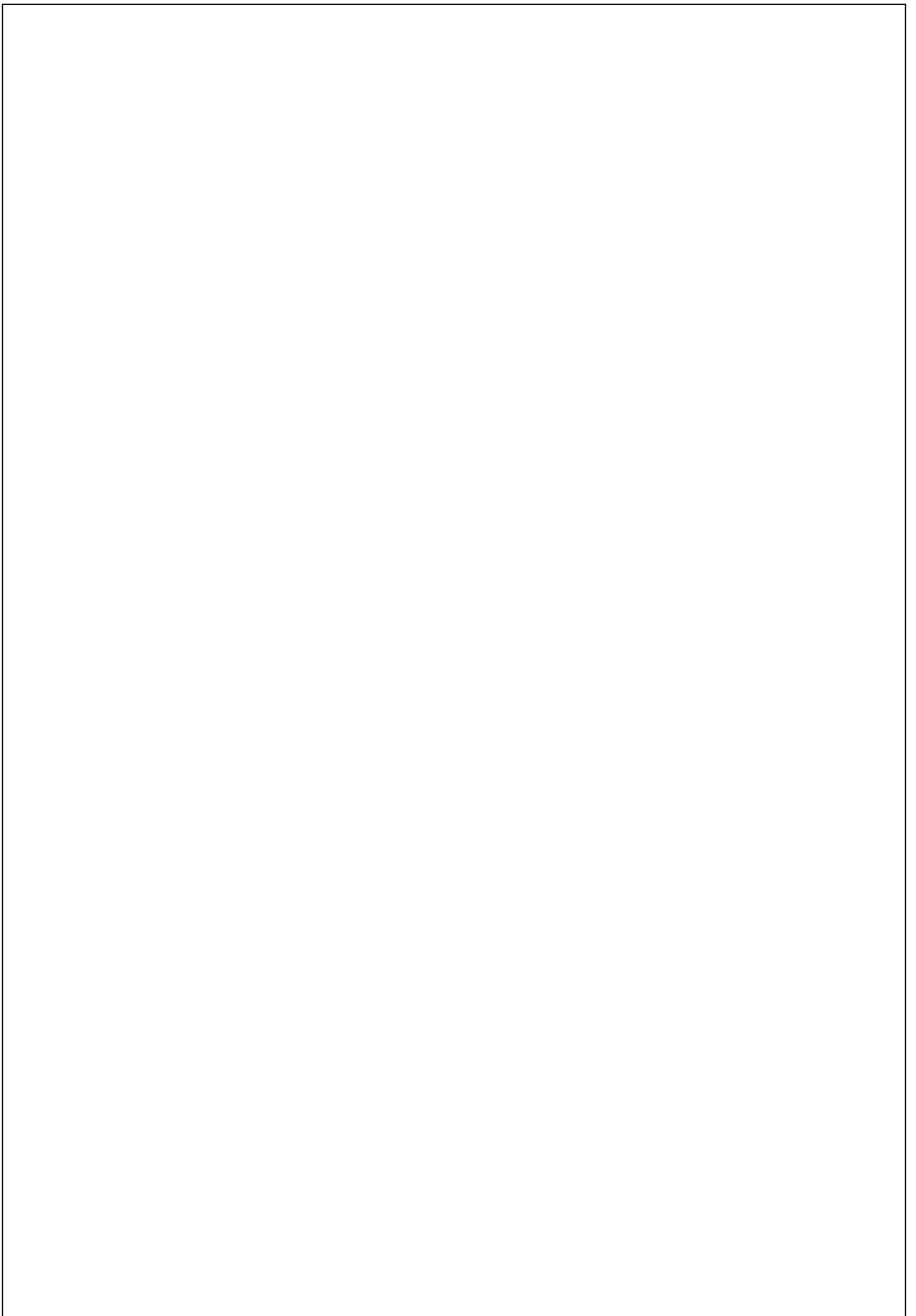
5. Biosynthesis of creatine?
6. De carboxylation?
7. Catabolism of gluco genic amino acids
8. Catabolism of Keto genic amino acids?


Unit-III

9. Deoxyribonucleotides?
10. Ribonucleotides?
11. Catabolism of purines?
12. Catabolism of pyrimidines?

Unit-IV

13. Glucose tolerance test?
14. Diabetic keto acidosis?
15. Lesch-Nyhan syndrome?
16. Phenylketonuria?



	P.R.GOVERNMENTCOLL EGE(A),KAKINADA	Program &Semester IIB.SC9FBC)BIO CHEMISTRY PAPER-IV (IV Semester)			
CourseCode 4212P	TITLEOFTHECOURSE INTERMEDIARYMETABOLISM PRACTICAL				
Teaching	Hours Allocated: 30(Practical)	L	T	P	C
Pre-requisites	TO ESTIMATE THE QUANTITAVE ESTIMATIONS OF BIOMOLECULES	2	-	-	2

COURSE CODE–BC4212P

Hrs:2

CREDITS-1

List of Experiments:

1. Estimation of amino acid by Ninhydrin method.
2. Estimation of protein by Biuret method.
3. Estimation of protein by Lowry method.
4. Estimation of glucose by DNS method.
5. Estimation of glucose by Benedict's titrimetric method.
6. Estimation of total carbohydrates by Anthrone method.

Recommended Books for Intermediary Metabolisms

8. Lehninger's Principles of Biochemistry–Nelson.D.L.andCox.M.M.,Freeman&Co.
9. Biochemistry–Berg.J.M.,Tymoczko.J.L.andStryer.L.,Freeman&Co.
10. Biochemistry–Voet.DandVoet.,J.G.,JohnWiley&Sons
11. Biochemistry-Lippincott's Illustrated Reviews.Champe,P.C.andHarvey,R.A.Lippincott
12. Fundamentals of Biochemistry–Jain,J.L.,Jain,S.,Jain,N.S.Chand&Co.
13. Biochemistry–Satyanarayana.UandChakrapani.U,Books&AlliedPvt.Ltd.
14. Biochemistry–Rama Rao. A and Ratna Kumari. D, Kalyani Publishers. Harpers – Biochemistry Strayer–Biochemistry

**BIOCHEMISTRY SYLLABUS
IV SEMESTER PAPER-IV
INTERMEDIARY METABOLISM
ADMITTED BATCH 2021-2022
PRACTICAL MODEL PAPER**

Time: 1.30 Hrs

Marks: 50M

Maximum M

1. Estimation of Carbohydrate by Anthrone method.

Principle and Procedure--

06Marks

Conduct of Experiment

08Marks

20Marks

Report

06Marks

2. Estimation of Glucose by DNS Method.

Principle and Procedure--

04Marks

Conduct of Experiment

05Marks

10Marks

Report

02Marks

3. Practical Record


10 Marks

4. Viva Voice

5 Marks

TOTAL

50Mark

	P.R.GOVERNMENT COLLEGE(A),KAKINADA	Program&Semester IIB.SC BIO CHEMISTRY PAPER-V (IV Semester)			
CourseCode	TITLE OF THE COURSE PHYSIOLOGY CLINICAL BIOCHEMISTRY & IMMUNOLOGY				
Teaching	Hours Allocated:60(Theory)	L	T	P	C
Pre-requisites	TO LEARN ABOUT THE PHYSIOLOGY AND NUTRITION CONCEPT AND KNOW ABOUT THE IMMUNE SYSTEM	-	4	-	3




Course Objectives:

After the successful completion of this course, the student will be able to

1. This gives an insight into the digestion, absorption of carbohydrates, protein and lipid and endocrine system.
2. This is to provide knowledge to the students to learn about human nutrition concepts and disorders associated and vitamins and minerals.
3. To provide basic knowledge about organization of immune system and antibodies function and activity.

COURSE OUTCOMES

On Completion of the course, the students will be able to	
CO1	An insight into the digestion, absorption of carbohydrates, protein and lipid..
CO2	Gain knowledge about the organization of endocrine system
CO3	To learn about human nutrition concepts and disorders associated and vitamins and minerals.
CO4	Understand the energy and dietary requirements for pregnant and lactating women
CO5	TO know the concept of blood coagulation
CO6	To provide basic knowledge about organization of immune system
CO7	To learn about the antibodies function and activity.

Skill Development		Employability		Entrepreneurship	
Course with focus on employability/entrepreneurship/Skill Development modules					

P.R GOVERNMENT COLLEGE(A),KAKINADA
CHOICE BASED CREDIT SYSTEM PAPER-V
PHYSIOLOGY, CLINICAL BIOCHEMISTRY & IMMUNOLOGY
ADMITTED BATCH 2021-2022

COURSECODE-BC5223

CREDITS-2

Hrs :4

INSTRUCTIONAL OBJECTIVES:

- 1. This gives an insight into the digestion, absorption of carbohydrates, protein and lipid. and endocrine system.**
- 2. This is to provide knowledge to the students to learn about human nutrition concepts and disorders associated and vitamins and minerals.**
- 3. To provide basic knowledge about organization of immune system and antibodies function and activity.**

Unit-I :Physiology and Endocrinology

18 hours

Digestion and absorption of carbohydrates, lipids and proteins. Composition of blood and coagulation of blood.

Endocrinology- Classification of hormones. Outlines of chemistry , physiological role and disorders of hormones of pituitary, thyroid, pancreatic hormones.

Unit-II: Nutritional Biochemistry

12 hours

Classification of Nutrients, calorific values of foods and their determination by bomb calorimeter. BMR and factors affecting it. Significance of BMR. . Sources of complete and incomplete proteins. Bulk and trace elements-Ca,Mg,Fe,I,Cu,Mo,Zn,SeandF.

Unit-III: Clinical Biochemistry 18 hours

Disorders of blood coagulation (hemophilia).Types of anemias, hemoglobinopathies-sickle cell anemia.

Liver :Structure and functions of Liver, jaundice.

Kidneys - structure of nephron, urine formation, normal and abnormal constituents of urine. Role of kidneys in maintaining acid-base and electrolyte balance in the body.

Unit-IV:Immunology

12 hours

Organization of immune system. Innate and acquired immunity. Structure of IgG, Classification of immunoglobulins, Epitopes /antigenic determinants. Concept of haptens .Adjuvants. Antigen – antibody reactions -agglutination, Precipitation, immunoprecipitation, immunodiffusion. .Immunodiagnostics -ELISA, RIA.

CO-POMapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	2	3	2	3	3	3	1	2	2	3	2	3	3
CO2	3	2	3	3	2	3	3	1	3	3	2	3	2
CO3	3	3	3	3	2	2	2	2	2	3	3	3	2
CO4	3	2	2	2	2	2	3	3	1	1	3	3	3

**P.R.GOVERNMENT COLLEGE (A), KAKINADA
B.SC(FBC)BIOCHEMISTRY**

**SECOND YEAR SEMESTER-IV
COURSE-PHYSIOLOGY CLINICAL
BIOCHEMISTRY AND IMMUNOLOGY**

WEIGHTAGE TO CONTENT

Time:2hours

Maxmarks:50M

UNIT NO.	ESSAY QUESTIONS 10MARKS	SHORT ANSWER QUESTIONS 5MARKS	MARKS ALLOTED TO THEUNIT	AS PER BLOOMS TAXONOMY
<u>UNIT- I</u>	02	02	30	Understanding remembering
<u>UNIT-II</u>	02	02	30	Analyzing understanding
<u>UNIT-III</u>	01	01	15	Evaluating and understanding
<u>UNIT-IV</u>	01	02	20	Analyzing applying
Total no .of Questions	06	07	95	

**NOTE: The question paper setters are requested to kindly adhere to the format given
in the above table.**

P.R.GOVERNMENT COLLEGE(A),KAKINADA
B.SC(FBC)BIOCHEMISTRY
SECONDYEAR IVSEMESTER
Course–PHYSIOLOGY CILINICAL BIOCHEMISTRY AND IMMUNOLOGY
Model Question Paper

Time2hrs.

Max.Marks-50M

PART-I

Note:-Answer any **THREE** questions choosing at least **ONE** question from each section

Section–A

10x3=30M

1. Describe the digestion and absorption of carbohydrates and proteins.
2. Describe the chemistry and physiological role of posterior pituitary hormones.
3. Define BMR. .Discuss the factors affecting the BMR.

Section–B

4. Describe antigen and antibody reactions.
5. Describe the mechanism of urine formation.
6. Explain the classification of immunoglobulins

PART–II

Answer any **FOUR** questions

4x5=20M

7. Composition of Blood
8. Thyroid gland.
9. Sources of complete and incomplete proteins
10. Iron
11. Jaundice
12. Structueofnephron
13. Immuno diagnostice

P.R.GOVERNMENT COLLEGE(A),KAKINADA

B.SC(FBC)BIOCHEMISTRY

SECONDYEAR IVSEMESTER

Course—physiology, cilinical biochemistry and immunology

Question bank

EASY QUESTIONS (10Marks)

Unit-I

1. Describe the digestion and absorption of Carbohydrates?
2. Describe the digestion and absorption of Proteins?
3. Describe the digestion and absorption of lipids?
4. Explain the process involved in Coagulation of blood?
5. Describe the chemistry and physiological role of posterior Pituitary hormones?
6. Explain about the classification of hormones?
7. Describe the chemistry and physiological role of Thyroid hormone?

Unit-II

8. Define BMR. Discuss the factors affecting the BMR.
9. Discuss about the Bulk and trace elements?
10. Determination of calorific values by bomb calorimeter?

Unit-III

11. Describe the mechanism of urine formation?
12. Write an essay on role of kidney in maintaining Acid-base and Electrolyte balance in body.
13. Explain the structure and functions of Liver?

Unit-IV

14. Explain the classification of immunoglobulins
15. Describe the antigen antibody reaction
16. Write the types of immune diffusion?

SHORT ANSWER QUESTIONS(5Marks)

Unit-I

1. Composition of Blood?
2. Physiological role of para thyroid gland
3. Absorption of Lipids?
4. Pancreatic hormones?

Unit-II


5. Sources of complete proteins
6. Sources of incomplete proteins?
7. Trace elements?

Unit-III

8. Types of Anemia's?
9. Jaundice?
10. Structure of Nephron?
11. Role of kidney in electrolyte balance.

Unit-IV

12. ELISA
13. RIA
14. Structure of IgG
15. Immuno precipitation

	P.R. GOVERNMENT COLLEGE(A), KAKINADA	Program & Semester			
		IBSC(FBC)			
		BIOCHEMISTRY (IV Semester) PAPER-V			
Course Code	TITLE OF THE COURSE PHYSIOLOGY CLINICAL BIOCHEMISTRY AND IMMUNOLOGY PRACTICAL				
Teaching	Hours Allocated: 30(Practical)	L	T	P	C
Pre-requisites	TO ESTIMATE THE LIFE SPAN AND COUNT OF BLOOD CELLS	2	-	-	2

PRACTICALS

List of Experiments :(3 periods/week)

credits-1

1. Estimation of vitamin by 2,6-dichlorophenol indophenols method
2. Estimation of hemoglobin in blood.
3. Total count –RBC and WBC.
4. Differential count Of WBC
5. Urine analysis for albumin, sugars and ketone bodies.
6. Estimation of Serum creatinine..
7. Estimation of serum total cholesterol



P.R.GOVERNMENT COLLEGE(A),KAKINADA

B.SC(FBC) BIOCHEMISTRY

SECONDYEAR IV SEMESTER

**Course—physiology ,clinical biochemistry and
immunology**

MODEL PRACTICAL QUESTION PAPER

Time:11/2Hrs

Maximum Marks:50M

1. Estimation of vitamin-c by 2,6-dichlorophenol indophenols method.

Principle and Procedure	06Marks	20Marks	↕
Conduct of Experiment	08Marks		
Report	06Marks		

2. Estimation of serum total cholesterol.

Principle and Procedure--	04Marks	15Marks	↕
Conduct of Experiment	08Marks		
Report	03Marks		

3. Practical Record 10Marks

4. Viva Voice 05 Marks

TOTAL 35M



P.R.GOVERNMENTCOLLEGE(A),KAKINADA

Program &Semester

IIBSC(FBC)BIO
CHEMISTRY
(V Semester)
PAPER-VI

Course Code 5224A	TITLE OF THE COURSE MOLECULAR BIOLOGY AND RECOMBINANT DNA TECHNOLOGY				
Teaching	Hours Allocated:60(Theory)	L	T	P	C
Pre-requisites	TO KNOW ABOUT REPLICATION TRANSCRIPTION TRANSLATION AND MOLECULAR BIOLOGY AND RECOMBINANT DNA TECHNOLOGY	-	4	-	3

Course Objectives: After the successful completion of this course, the student will be able to

1. This is to provide knowledge about protein synthesis & their events, regulation of gene expression
2. This is to provide knowledge to the students to learn about recombinant DNA technology
3. This also imparts knowledge about molecular biology blotting techniques

COURSE OUTCOMES

On Completion of the course, the students will be able to	
CO1	Understand the concept OF REPLICATION
CO2	Gain knowledge about Enzymology of replication
CO3	To know the process of transcription
CO4	To know the process of translation
CO5	Illustrate about routes in recombinant DNA technology
CO6	To know the various blotting techniques in molecular biology

Skill Development		Employability		Entrepreneurship	
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P.R.GOVERNMENT COLLEGE(A),KAKINADA
CHOICE BASED CREDIT SYSTEM
BIOCHEMISTRY SYLLABUS
SEMESTER-V,PAPER-VI
MOLECULAR BIOLOGY AND RECOMBINANT TECHNOLOGY

COURSECODE -5224A

CREDITS - 4

Unit-I:DNA Replication and Transcription **24 hours**

Nature and structure of the gene. DNA as genetic material DNA replication– models of replication, Meselson-Stahl’s experiment proof for semi–conservative model. DNA Polymerases I, II and III of *E.coli* ,helicase, topoisomerases, primase, ligase. Mechanism DNA Replication in E.Coli. Inhibitors of DNA replication. Transcription –RNA polymerases of prokaryotes, Mechanism of Transcription - .Initiation–sigma factors and their recognition sites, Promoters, Elongation, Termination –rho dependent and rho -independent. Inhibitors of Transcription.

Unit-II: Protein Synthesis and Regulation of Gene Expression **12 hours**

Genetic code: features of genetic code, wobble hypothesis, degeneracy of genetic code. Protein synthesis – Ribosome structure t-RNA, activation of amino acids (amino acyl t-RNA synthetases). Initiation, elongation and termination of protein synthesis. Post –translational modifications. Inhibitors of protein synthesis.

Unit-III:Recombinant DNA technology **12 hours**

Basic steps in r-DNA technology. Tools of r-DNA technology : Enzymes – Restriction Endonucleases, ligase, phosphatases, reverse transcriptase, polynucleotide kinases, terminal transferase nucleases -S1 and RNAaseH.Cloning vectors -Plasmids, Cosmids, λphages vectors .Applications of gene cloning – production of insulin and human growth hormone, production of Bt cotton and edible vaccines.

Unit-IV: Molecular biology Techniques and Bioinformatics **12 hours**

Construction of c-DNA and genomic libraries DNA sequencing–Maxam Gilbert and Sanger’s methods. Polymerase chain reaction–principle and applications. Outlines of blotting techniques -Southern, Northern and Western. Introduction to Bioinformatics-definitions of proteomics and genomics .Gene bank, NCBI, DDBJ, Swissprot, PDB. Sequence alignments –BLAST and FASTA.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	2	3	2	3	3	3	1	2	2	3	2	3	3
CO2	3	2	3	3	2	3	3	1	3	3	2	3	2
CO3	3	3	3	3	2	2	2	2	2	3	3	3	2
CO4	3	2	2	2	2	2	3	3	1	1	3	3	3

**P.R.GOVERNMENT COLLEGE(A),KAKINADA
B.SC(FBC)BIOCHEMISTRY
THIRD YEAR SEMESTER-V
COURSE - MOLECULARBIOLOGY AND
RECOMBINANTDNATECHNOLOGY**

WEIGHTAGETOCONTENT

Time:2.30hours

Maxmarks:60

UNITNO.	ESSAY QUESTION S10MARKS	SHORT ANSWER QUESTION S5MARKS	VERY SHORT ANSWER QUESTIO NS 2 MARKS	MARKS ALLOTD TO THEUN IT	AS PER BLOOMS TAXONOMY
<u>UNIT -1</u>	02	02	01	32	Analyzing applying
<u>UNIT-II</u>	02	02	01	32	Understanding evaluting
<u>UNIT-III</u>	01	01	02	19	Creating analyzing
<u>UNIT-IV</u>	01	02	02	24	Creating applying
Total no .of Questions	06	07	06		
Total Marks including choice				107	

NOTE: The question paper setter are requested to kindly adhere to the form at given in the above table.

P.R.GOVERNMENT COLLEGE(A),KAKINADA
B.SC(FBC)BIOCHEMISTRY
THIRDYEARVSEMESTER
Course–MOLECULARBIOLOGY AND REOMBINANT DNA TECNOLOGY
Model Question Paper

Time 2hrs.

Max.Marks-50M

Time: 2.30hrs

PART –I

Marks:60

Note:- Answer *any* **THREE** questions choosing at least **ONE** question from each section.

3X10=30M

SECTION–A

1. Write the experiments to prove DNA as genetic material.
2. Explain the process of replication in prokaryotes.
3. What is genetic code ? Explain the properties of genetic code.

SECTION–B

4. Describe the process of protein synthesis in prokaryote
5. Describe the Restriction endonucleases and with examples
6. Write an account on Blotting techniques.

PART–II

Answer any **FOUR** questions

4x5=20M

7. Messelson's and Stahl's experiment
8. Nature and structure of gene.
9. Inhibitors of protein synthesis.
10. Structure of RNA
11. Human Growth Hormone.
12. PCR
13. NCBI

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PART-III

5X2=10M

Answer any **FIVE** questions

14. Ligase

15. Wobble hypothesis

16. Cosmid

17. Vaccines

18. C-DNA

19. Gene bank

P.RGOVERNMENT COLLEGE(A) KAKINADA

II BSC (FBC) BIOCHEMISTRY

SEMESTER-V PAPER-VI

COURSE-MOLECULAR BIOLOGY AND RECOMBINANT DNA TECHNOLOGY

QUESTION BANK

ESSAY QUESTIONS(10M)

EASY QUESTIONS(10Marks)

Unit-I

1. Write the experiments to prove DNA as genetic material?
2. Explain the models of DNA Replication?
3. Explain the types of DNA polymerases in E.coli?
4. Describe the process of Replication in E.coli?
5. Explain the process of Transcription in prokaryotes?

Unit-II

6. What is Genetic code? Explain the properties of genetic code?
7. Describe the process of protein synthesis In prokaryotes?

Unit-III

8. Describe the Restriction endonucleases and with examples?
9. Explain the Tools of r-DNA Technology?
10. Explain the types of Cloning Vectors?

Page|5

Unit-IV

11. Explain the Construction of c-DNA and genomic libraries?
12. Explain the principle and applications of polymerase chain reaction?
13. Describe the Blotting techniques?

SHORT ANSWER QUESTIONS(5Marks)

Unit-I

1. Nature and structure of the gene?
2. Semi-conservative model of replication?
3. Inhibitors of DNA Replication?
4. Inhibitors of Transcription?
5. Termination of Transcription?

Unit-II

6. Ribosome structures
7. Inhibitors of protein synthesis?
8. Wobble hypothesis?
9. Post-translational modification?

Unit-III

10. Production of insulin?
11. Applications of gene cloning.
12. Edible vaccines

Unit-IV

13. DNA sequencing-Sangers method?
14. Southern blotting?
15. BLAST?
16. NCBI?
17. FASTA?

VERY SHORT ANSWER QUESTIONS (2Marks)

Unit-I

1. Promoters?
2. Primase?
3. Ligase?
4. Helicase
5. Topoisomerase?

Unit-II


6. Genetic code
7. t-RNA
8. Translation

Unit-III

9. RNAase
10. Cosmid
11. Vaccine
12. Reverse transcriptase

Unit-IV

13. c-DNA?
14. Gene bank?
15. Swiss port?
16. PDB?

	P.R.GOVERNMENT COLLEGE(A),KAKINADA		Program & Semester III B.SC(FBC),BIOC HEMISTRY (V Semester)			
Course Code 5224P	TITLE OF THE COURSE MOLECULAR BIOLOGY AND RECOMBINANT DNA TECHNOLOGY PRACTICAL					
Teaching	Hours Allocated:30(Practical)		L	T	P	C
Pre-requisites	TO LEARN QUANTATIVE ESTIMATIONS OF NUCLEIC ACIDS		2	-	-	2

PRACTICALS

COURSE CODE:BC5224(A)P

LIST OF EXPERIMENTS:

CREDITS-2

1. Isolation of DNA from onion/liver coconut endosperm
2. Estimation of DNA by diphenylamine method.
3. Estimation of RNA by orcinol method.
4. Sequence alignments of insulin / BSA with other proteins using BLAST and FASTA.
5. Immobilization of microorganisms.
6. Ethyl alcohol production from grapes

P.R.GOVERNMENT COLLEGE(A), KAKINADA

B.SC(FBC)BIOCHEMISTRY

THRD YEAR VSEMESTER

**Course–MOLECULAR BIOLOGY AND RECOMBINANT
DNA TECHNOLOGY**

MODEL PRACTICAL QUESTION PAPER

Time:11/2Hrs

MaximumMarks:35

1.Estimation of DNA by Diphenylamine method.

Principle and Procedure--

04Marks

Conduct of Experiment

08Marks

15Marks

Report

3Marks

2.Estimation of Ethyl alcohol from grapes.

Principle and Procedure--

3Marks

Conduct

05Marks

10Marks

Of Experiment

Report

2Marks

3.Practical Record


05Marks

4.Viva Voice

05Marks

TOTAL

35Marks

	P.R.GOVERNMENTCOLLEGE(A),KAKINADA		Program &Semester			
Course Code	TITLEOFTHECOURSE BIOCHEMICAL CORRELATION INDISORDERS		III B.SC BIOCHEMISTRY PAPER-VII (IVSemester)			
Teaching	Hours Allocated:60(Theory)		L	T	P	C
Pre-requisites	TO PROVIDE KNOWLEDGE ABOUT DISORDERS OF ENDOCRINE GLANDS AND PROTEIN MAL NUTRITIONS		-	4	-	3

CourseObjectives: After the successful completion of this course, the student will be able to understand

1. This is to provide knowledge about disorders of endocrine glands -pituitary & thyroid gland.
2. This also imparts knowledge about protein malnutrition, disordersof vitamins &digestive system.

COURSEOUTCOMES

On Completion of the course, the students will be able to	
CO1	This is to provide knowledge about disorders of endocrine glands
CO2	This also imparts knowledge about protein malnutrition
CO3	To learn about disorders of vitamins
CO4	This is also imparts knowledge about disorders of vitamins.

SkillDev elopment		Employability		Entrepreneurship	
Coursewith focusonemployability/entrepreneurship/SkillDevelopmentmodules					

P.R.GOVERNMENTCOLLEGE(A), KAKINADA

CHOICE BASED CREDIT SYSTEM

III B.Sc BIOCHEMISTRY

PAPER-VII ELECTIVE-(B)

Biochemical Correlations in Disorders ADMITTED BATCH 2020-2023

INSTRUCTIONAL OBJECTIVES:

CREDITS-4

3. This is to provide knowledge about disorders of endocrine glands-pituitary & thyroid gland.
4. This also imparts knowledge about protein malnutrition, disorders of vitamins & digestive system.

Unit-I: 15 hours

- 1.1 Outline of hormone reaction and imbalances leading to disease –precocious puberty, hyper And hypo pituitarism.
- 1.2 Hyper and hypothyroidism.
- 1.3 Hype rand hypo disorders of adrenal gland.

Unit-II: 15 hours

- 2.1 **Protein calorie malnutrition**-Kwashiorkor, Marasmus,
- 2.2 **DISORDERS OF VITAMINS WATER SOLUBLE:** Beriberi, Scurvy, Pellagra, Pernicious anemia,

DISORDERS OF VITAMINS FAT SOLUBLE: Night blindness, Rickets, Osteomalacia, and Osteoporosis

- 2.4 Obesity ,cardiovascular diseases,

Unit-III: 15 hours

- 3.1 Alzheimer's,Huntington's disease,
- 3.2 Creutzfeldt- Jakob disease,
- 3.3 Haemoglobinopathies: Sicklecellanaemia, Thalassemia.
- 3.4 Wilson'sdisease , Menken'sdisease, Goiter

Unit-IV:Organ Specific disorders 15 hours

4.1 Digestive system:

Gastritis, peptic ulcers, pancreatitis, steatorrhea, cirrhosis of liver, gallstones ,appendicitis

4.2 Renal Disorders:

Acute and chronic renal failure, kidney stones[Renal calculi]Acute and Chronic Glomerular nephritis

CO-POMapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	2	3	2	3	3	3	1	2	2	3	2	3	3
CO2	3	2	3	3	2	3	3	1	3	3	2	3	2
CO3	3	3	3	3	2	2	2	2	2	3	3	3	2
CO4	3	2	2	2	2	2	3	3	1	1	3	3	3

P.R.GOVERNMENT COLLEGE(A),KAKINADA

III.B.SC BIOCHEMISTRY

PAPER -VII ELECTIVE-(B)

**BIOCHEMICAL CORELATIONS IN
DISORDERS**

ADMITTED BATCH

WEIGHTAGETOCONTENT

Time:2.30hours

Maxmarks:60 marks

UNIT	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIOS 5 MARKS	VERY SHORT ANSWER QUESTONS 2 MARKS	MARKS ALLOTED TO THE UNIT	AS PER BLOOMS TAXNOMY
UNIT-I	01	02	02	24	Under standing
UNIT-II	02	01	01	27	Analyzing
UNIT-III	01	02	02	24	remembering
UNIT-IV	02	02	01	32	Understanding &rembering
Total no. of Questions	06	07	06		
Total Marks including choice				107	

NOTE:The question paper setters are requested to kindly adhere to the format given in the abovetable.

P.R.GOVERNMENT COLLEGE(A),KAKINADA

B.SC (FBC) BIOCHEMISTRY

THIRD YEAR V SEMESTER

Course–BIO CHEMICAL CORRELATIONS IN DISORDERS

ModelQuestionPaper

Time2hrs.

Max.Marks-50M

PART-I

Time:2.30hrs.

Marks;60M

PART-I

Note: Answer any THREE questions choosing at least one question from each section

10 x 3 = 30 M

SECTIONA

- 1.Discuss the various disorders of Adrenal gland?
2. Write an essay on disorders of Water soluble vitamins?
3. Write about the diseases of Alzheimer's and Wilson's disease?

SECTIONB

4. Write about the any two disorders of digestive systems?
- 5..Describe the any two Renal disorders?
6. Write an essay on disorders of Fat soluble vitamins?

PART-II

Answer any **FOUR** question

4x5=20M

- 7.Hyperpituitarism
- 8.Kwashiorkar.
- 9.Goiter
10. Sickle cell anemia
11. Chronic Glomerular nephritis
12. Appendicitis
13. Hyperthyroidism

Answer any **FIVE** Questions

14. Precocious puberty

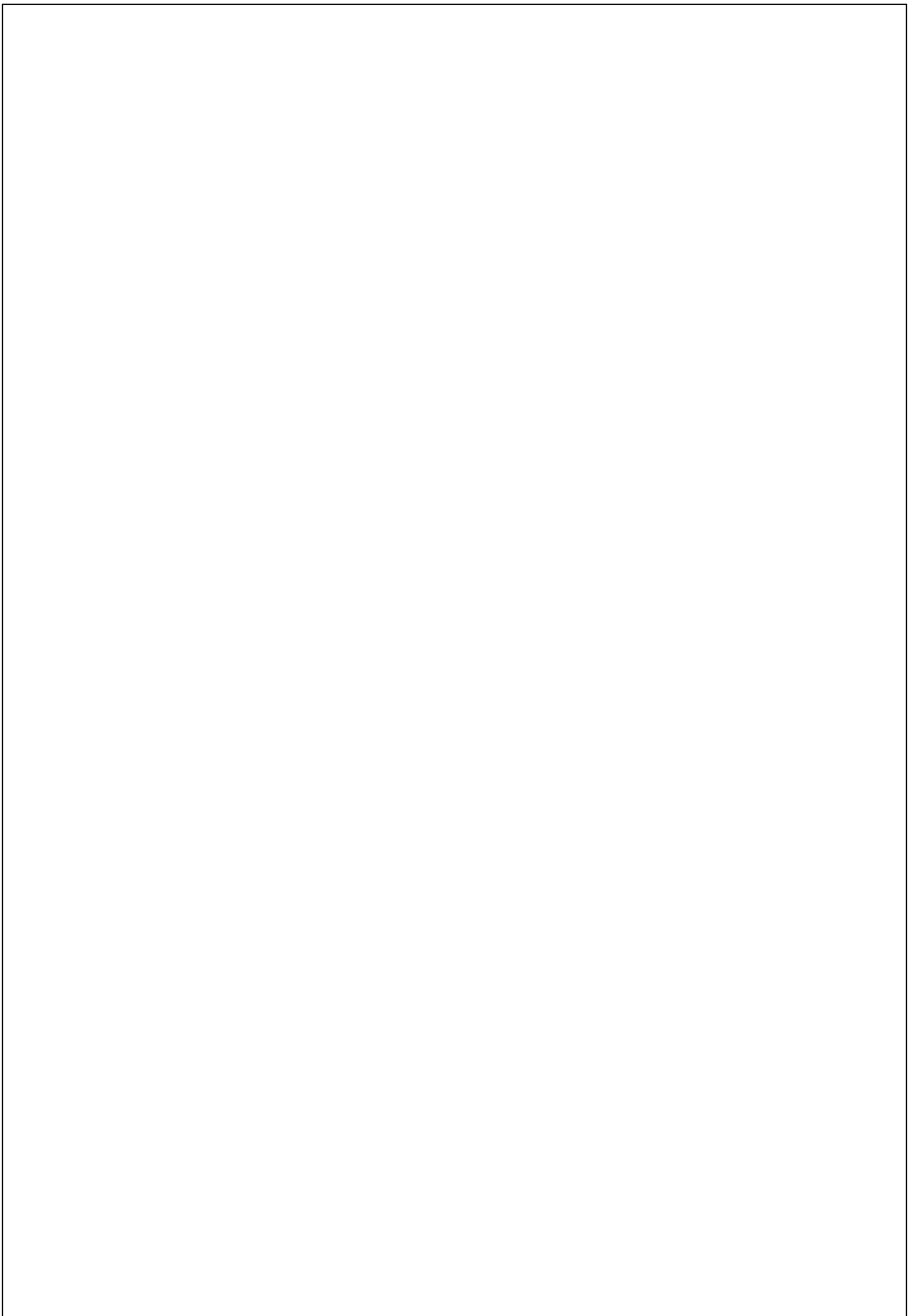
15. Glucocorticoids

16. Obesity

17. Anemia.

18. Gastritis,

19. Renal calculi



P.R.GOVERNMENT COLLEGE(A),KAKINADA

B.SC(FBC) BIOCHEMISTRY

THIRD YEAR VSEMESTER

Course–BIO CHEMICAL CORRELATIONS IN DISORDERS

Question bank

EASY QUESTIONS (10Marks)

Unit-I

1. Explain the hyper and hypo pituitarism?
2. Explain the hypo and hyper Thyroidism?

Unit-II

3. Define water soluble vitamins? Explain the biology and deficiency disorder Of vitamin?
4. Explain the biology and deficiency disorder of vitamin B3?
5. Explain the biology and deficiency disorder of vitamin-D?
6. Explain the coronary artery diseases?

Unit-III

7. Write about the diseases of Alzheimer's and Wilson's disease?
8. Explain about the Hemoglobinopathies?

Unit-IV

9. Describe the any two Renal disorders?
10. Write about the any two disorders of digestive systems?

SHORT ANSWER QUESTIONS (5Marks)

Unit-I

1. Addison's diseases.
2. Hypo pituitarism.
3. Catecholamines.
4. Growth hormone?

Unit-II

5. Kwashiorkor?
6. Marasmus?
7. Pernicious anemia?
8. Night blindness?
9. Obesity

Unit-III

10. Sickle cell anemia?
11. Goiter?
12. Huntington's disease?
13. Creutzfeldt –Jakob disease?
14. Wilson's disease?

Unit-IV

15. Cirrhosis of liver?
16. Appendicitis?
17. Renal calculi

SHORT ANSWER QUESTIONS(2MARKS)

Unit-I

1. Growth hormone
2. ACTH
3. Corticoids.
4. Epinephrine

Unit-II

5. Pellagra
6. Scurvy

7.Rickets

1. .Obesity

9.High blood pressure

Unit-III

10.Blood coagulation

11.Hemoglobin

12.Alzheimer's.


Unit-IV

13.Gastritis

14.Gallstones

15.Kidney stones.

16.Peptic ulcers.

	P.R.GOVERNMENTCOLLEGE(A),KAKINADA	Program &Semester			
		III B.SC(FBC), BIOCHEMISTRY (V Semester)			
CourseCode 5224P	TITLEOFTHECOURSE BIO CHEMICAL CORRELATIONS IN DISORDERS PRACTICAL				
Teaching	HoursAllocated:30(Practical)	L	T	P	C
Pre-requisites	TO LEARN ABOUT THE BIOLGICAL PARAMETERS	2	-	-	2

PRACTICALSLIST:

CREDITS-2

1. Glucose tolerance test.
2. Lipid profile: triglycerides and total cholesterol.
3. Obesity parameters.
4. RBC counting and hemoglobin estimation.
5. Blood pressure measurements.

SUGGESTEDREADINGS

1. TextbookofBiochemistrywithClinicalCorrelations(2011)Devlin,T.M.JohnWiley&Sons,Inc.
2. Immunology: A Short Course (2009) 66th ed., Coico, R and Sunshine, G., John Wiley & sons, Inc(New Jersey),ISBN:978-0-470-08158-7
3. Biochemistry(2012)7thed.,Berg,J.M.,Tymoczko,J.L.andStryer,L., W.HFreemanandCompany(NewYork),ISBN:13:978-1-4292-7635-1.
4. Genetics (2012) 6th ed., Snustad, D.P.and Simmons, M.J.,JohnWiley&Sons.(Singapore), ISBN:978-1-118-09242-2.

P.R GOVERNMENT COLLEGE(A) KAKINADA
B.SC(FBC) BIO CHEMISTRY
THIRD YEAR SEMESTER-V PAPER VII

MODEL PRACTICAL QUESTION;

Time:1 1/2Hrs

MaximumMarks:35

1. Estimation of RBC Counting and hemoglobin.		
Principle and Procedure--	04 Marks	
Conduct of Experiment	08 Marks	15Marks
Report	03Marks	
2. Glucose tolerance test.		
Principle and Procedure--	03 Marks	
Conduct of Experiment	05Marks	10Marks
Report	2Marks	
3. Practical Record	05Mark	
4. Viva Voice	05Marks	
TOTAL	35Marks	

