PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS)

KAKINADA



BOARD OF STUDIES

DEPARTMENT OF BIOCHEMISTRY **2017-18**

(CHOICE BASED CREDIT SYSTEM)

P.R.GOVT.COLLEGE (AUTONOMOUS) KAKINADA. 2017-18, BOARD OF STUDIES MEETING. Dt.13.04.2017 DEPARTMENT OF BIOCHEMISTRY

The members present have discussed the syllabi 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 75% external and 25% internal marks for both theory and practical's from the academic year 2017-18.
- **Resolution III**: Resolved to Conduct 25 Marks of Theory internal examination.
- **Resolution IV**: Resolved to conduct Practical examination also at the end of each semester for I year students from the academic year 2017-18.
- **Resolution V**: Resolved to follow the same syllabus and exam pattern for the coming II and III year students.
- **Resolution VI**: Resolved to continue two Subject Electives in Fifth Semester as Advanced Electives (Elective 1-Immunology and Elective 2-Clinical Biochemistry) and in Sixth Semester two Skill Based Electives (Elective 1-Microbiology and Elective 2- rDNA technology).
- **Resolution VII** : Resolved to continue the same paper setters and Examiners for all semesters.(List of Paper setters and Examiners is appended)
- **Resolution VIII :** Resolved to include Blue Prints for model question papers for All semesters.

Chairperson Board of Studies Dept. of Biochemistry

P.R. GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

DEPARTMENT OF BIOCHEMISTRY

BOARD OF STUDIES MEETING 2017-18 CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2014-15)

Time:2.00 PM

Date: 13.04.2017

Venue: Department of Biochemistry

The BOARD OF STUDIES Meeting of the Department of Biochemistry took place 2.00 PM on 13.04.2017 in the Department of Biochemistry P.R. Govt. College, (A) Kakinada for the year 2017-18. The following members attended.

SI No	Name and affiliation	Designation	Signature
01	Mrs.K.Deepthi Assistant Professor Department of Chemistry Adikavi Nannaya University RAJAHMAHENDRAVARM.	Vice- Chancellor's Nominee	
02	Prof P.Ramakrishna Programme Director School of Food Technology JNTU Kakinada.	Subject Expert	
03	Dr.A.Sreenivasulu Director V.S.Lakshmi Research Center Kakinada.	Subject Expert	
04	Sri E.V.S.Subramanyam Lecturer in Chemistry Academic Coordinator P.R.Govt.College Kakinada.	Memeber	
05	Sri T. VaraPrasad Lecturer in-Charge Dept. of Biochemistry P.R.Govt.,College Kakinada.	Member	
06	Sri Mallikarjuna sharma Lecutrer in Chemistry P.R.Govt.College Kakinada.	Member	
07	Mrs.K.G.V.V.Lakshmi Guest Facualty in Bio Chemistry P.R.Govt College, Kakinada	Member	

P.R.GOVT.COLLEGE (AUTONOMOUS) KAKINADA DEPARTEMENT OF BIOCHEMISTRY AND FOOD SCIENCE BOARD OF STUDIES MEETING IN FOOD SCIENCE 2017-2018 LIST OF EXAMINERS

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

P.R. GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA DEPARTMENT OF BIOCHEMISTRY BOARD OF STUDIES MEETING 2017-18 CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2014-15)

		Course		Hrs/w		Max.marl	ks	
S.No	Sem	code	Course Title	eek	Int.	Ext.	Tot.	Credits
1.	Ι	BC1212	Biomolecules –I	4	25	75	100	3
			Biomolecules - I practicals	2	15	35	50	2
2.	II	BC2212	Biomolecules-II	4	25	75	100	3
3.	Prac.	BC2212P	Biomolecules - II practicals	2	15	35	50	2
4.	III	BC3212	Enzymology and Biophysical techniques	4	30	70	100	3
5.	IV	BC4212	Bioenergitics and Metabolism	4	30	70	100	3
6.	Prac	BC4212P	Quantitave analysis, enzymology and bio physical techiniques	2	30	70	100	2
7.	IV		General elective : Nutrition and clinical biochemistry	2	30	70	100	2
8.	V	BC5223	Advanced Core: Physiology and Nutrition	3	30	70	100	3
9.	V	BC5224A	Adv.Elective-1:Immunology	3	30	70	100	2
10.	V	BC5334B	Adv.Elective-2:Clinical Biochemistry	3	30	70	100	2
11.	V	BC5223P	Advanced Core Practical - Physiology and Nutrition	2	15	35	50	2
12.	V		Advanced Elective Practical	2	15	35	50	
13.	VI	BC6223	Skill based core: Cell biology and Molecular biology	3	30	70	100	3
14.	VI	BC6224A	Skill based Elective-1: Microbiology	3	30	70	100	2
15.	VI	BC6224B	Skill based Elective-2: Regulation of gene expression and Genetic engineering	3	30	70	100	2
16.	VI	BC6224A	Skill based Core Practical - Cell biology and Molecular biology	2	15	35	50	2
17.	VI		Skill based Elective Practical	2	15	35	50	2

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM BIOCHEMESTRY SYLLABUS (WITH EFFECTIVE FROM 2017-18) SEMESTER - I BIOMOLECULES-I

COURSE CODE – BC 1212

Hrs:4

CREDITS-3

INSTRUCTIONAL OBJECTIVES

The objective of this paper is to learn carbohydrates & their classification, Aminoacids & their classification proteins & their classification and to learnabout the structures and functions of carbohydrates, aminoacids and proteins.

MODULE-I

Water as a biological solvent and its role in biological processes.

Carbohydrates: Classification, monosaccharides, D and L designation, open chain and cyclic structures, epimers and anomers, mutarotation, reactions of carbohydrates (due to functional groups - hydroxyl, aldehyde and ketone). Amino sugars, Glycosides.

MODULE-II

Structure and biological importance of disaccharides (sucrose, lactose, maltose, isomaltose, and trehalose), trisaccharides (raffinose, melezitose), structural polysaccharides (cellulose, chitin, pectin) and storage polysaccharides (starch, inulin, glycogen). Glycosaminoglycans, Bacterial cell wall polysaccharides. Outlines of glycoproteins, glycolipids and blood group substances.

MODULE-III

pH, Buffers, Henderson- Hasselbalch equation.

Amino Acids: Classification, structure, stereochemistry, chemical reactions of amino acids due to carbonyl and amino groups. Titration curve of glycine and pK values. Essential and non-essential amino acids, non-protein amino acids.

MODULE-IV

Peptide bond - nature and conformation. Naturally occurring peptides – glutathione, enkephalin.

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 (E.g. Hemoglobin and Myoglobin), forces stabilizing the structure of protein. Outlines of protein sequencing.

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2017-18) <u>BIOMOLECULES-I</u> <u>MODEL QUESTION PAPER</u>

Time: 3 hrs.

:75M

PART - 1

Note:Answer any <u>THREE</u> questions choosing at least one question from each Section 3 30M

SECTION-A

1. Write the classification and properties of Monosaccharides.

2. Describe the structure and biological importance of storage polysaccharides.

3. Describe the bacterial cell wall polysaccharides.

SECTION-B

4. Describe various chemical reactions of amino acids

5.Describe various levels of structural organization of proteins.

6.Write the classification of proteins based on solubility.

PART-II

Answer any <u>**FIVE</u>** questions(Short answer questions) Marks</u>

7. Structure and biological importance of Sucrose.

8. Mutarotation.

- 9. Henderson-Hasselbalch equation
- 10. Peptide bond synthesis.
- 11. Structure and biological importance of Sucrose.
- 12. Peptide- Glutathione
- 13. Protein sequencing
- 14. Water as biological solvent

5x5=25

 $3 \ge 10 =$

Marks

PART-III

Answer any <u>TEN</u> questions.(Very short a	10x2=20 Marks	
15.Anomers.	21. Essential and non-essential amino a	acids.
16.Inulin.	22. Epimer	
17.Glycoproteins	23. Aromatic Amino Acids	
18. Buffer	24.Amino sugar	
19. Peptide bond	25.protein Denaturation	
20. Structure of sedoheptulose, Lyxose.	26. Chitin	

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2017-2018) <u>BIOMOLECULES-I</u> BLUE PRINT FOR QUESTION PAPER SETTER

Time : 3 hours

Max marks: 75

MODULE NO.	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 5 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTED TO THE UNIT	
MODULE – I	01	02	03	26	
MODULE – II	02	02	03	36	
MODULE – III	01	02	03	26	
MODULE – IV	02	02	03	36	
Total no. of Questions	06	08	12		
Total Marks including choice					

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

in the above table.

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2017-2018) <u>SEMESTER - I</u> BIOMOLECULES-1 PRACTICAL

Hrs:2

CREDITS-2

- 1. Preparation of buffers (acidic, neutral and alkaline) and determination of pH.
- 2. Qualitative identification of carbohydrates- glucose, fructose, ribose/xylose, maltose, sucrose, lactose, starch/glycogen.
- 3. Qualitative identification of amino acids histidine, tyrosine, tryptophan, cysteine, arginine.
- 4. Titration curve of glycine and determination of pK and pI values.
- 5. Isolation of starch from potatoes.

6.Isolation of egg albumin from egg white.

7.Isolation of cholesterol from egg yolk.

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2017-2018) AT THE END OF I SEMESTER

BIOMOLECULES - I MODEL PRACTICAL PAPER

Time:	1 1/2 hrs.			Marks: 35
I.	Qualitative test for Identi	ification of amino acids		
	Principle and Procedure		04Marks	
	Conduct of Experiment		08Marks 15 Marks	
	Report		3 Marks	•
2	.Isolation of starch from pota	toes		
	Principle and Procedure		3 Marks	•
	Conduct of Experiment		5 Marks 10 Marks	Î
	Report		2 Marks	•
3.	Practical Record		5 Marks	
4.	Viva Voice		5 Marks	
		TOTAL	35 Marks	

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P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM BIOCHEMESTR SYLLABUS (WITH EFFECTIVE FROM 2017-2018) SEMESTER - II BIOMOLECULES-II

Hrs : 4 INSTRUCTIONAL OBJECTIVES

COURSE CODE – BC 2212 CREDITS-3

- 1. The objective of this paper is to learn lipids & their classification and to learn about bio-membranes and their properties.
- 2. This course deals with the nature of nucleotides, their physical and chemical properties and about porphyrins and their properties.

BIOMOLECULES

MODULE-I

Lipids: Classification, saturated and unsaturated fatty acids, structure and properties of fats and oils (acid, saponificition and iodine values, rancidity). General properties and structures of phospholipids, sphingolipids and cholesterol. Prostaglandins- structure and biological role of PGD₂,PGE₂ and PGF₂. Lipoproteins: Types and functions

MODULE-II

Biomembranes: Behavior of amphipathic lipids in water- formation of micelles, bilayers, vesicles, liposomes. Membrane composition and organization – Unit membrane model, sandwich model and Fluid mosaic model. Membrane transport.

MODULE-III

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 Nucleic acids- 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, cot curves and their significance. Types of DNA and RNA.

MODULE-IV

Porphyrins: Nomenclature and classification of porphyrins.Structure, properties and functions of heme. Types, structures and functions of chlorophylls. Structure, functions and properties of cytochromes.

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2017-2018) <u>SEMESTER - II</u> BIOMOLECULES-II MODEL QUESTION PAPER

Time: 3 hrs.

75M

Marks:

 $5 \times 5 =$

PART - I

Note:Answer any <u>THREE</u> questions choosing at least one question from each Section. 3 x 10 =

30M

SECTION-A

- 1. Write the general properties and structures of phospholipids.
- 2. Write an account on structure of prostaglandins and biological role of PGD2, PGE2.
- 3. Describe the molecular structure of fluid mosaic model of plasma membrane.

SECTION-B

- 4. Write the structure and properties of purine and pyramidine nucleotides.
- 5. Write an account on Watson-Crick DNA double helix structure.
- 6. Explain the structure, properties and functions of heme.

<u>PART – II</u>

Answer any <u>FIVE</u> Questions. 25M

7. Lipoproteins-Types and functions

- 8. General properties and structures of sphingolipids.
- 9. Unit membrane model
- 10. Types of RNA's and their functions
- 11. Super coiling of DNA.
- 12. Properties of cytochromes.
- 13. Effect of cytochromes
- 14. Membrane transport

<u>PART – III</u>

Answer any <u>TEN</u> Questions. 20M

15. Saponification	21. Liposomes.
16. Micelle	22. Chlorophyll.
17. Rancidity	23. cholesterol
18. Lecithin	24.Symport
19. Nucleotide	25.Heme
20. Linking number	26. Melting temperature.

10 x 2 =

P.R.GOVERNMENT COLLEGE (A), KAKINADA **CHOICE BASED CREDIT SYSTEM** (WITH EFFECTIVE FROM 2017-2018) **II SEMESTER BIOMOLECULES-II**

BLUE PRINT FOR QUESTION PAPER SETTER

Time: 3 hours

Max marks:

75

MODULE NO.	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 5 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTED TO THE UNIT
MODULE – I	02	02	03	36
MODULE – II	01	02	03	26
MODULE – III	02	03	03	41
MODULE-IV	01	01	03	21
Total no. of Questions	06	08	12	
Tot	al Marks includ	ing choice		124

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

in the above table.

P.R.GOVERNMENT COLLEGE (A), KAKINADA <u>CHOICE BASED CREDIT SYSTEM</u> (WITH EFFECTIVE FROM 2017-2018) <u>SEMESTER - II</u> <u>BIOMOLECULES-II PRACTICALS</u>

COURSE CODE –

BC2212P Hrs:2

CREDITS-2

- **1.** Qualitative identification of lipids- solubility, saponification, acrolein test, Salkowski test, Lieberman-Burchard test.
- **2.** Estimation of DNA by DPA method.
- **3.** Estimation of RNA by orcinol method.
- **4.** Isolation of casein from milk.
- **5.** Qualitative identification of Nitrogen bases

P.R.GOVERNMENT COLLEGE (A), KAKINADA **CHOICE BASED CREDIT SYSTEM** (WITH EFFECTIVE FROM 2017-2018) AT THE END OF II SEMESTER

BIOMOLECULES-II MODEL PRACTICAL PAPER

Time:	1 1/2 hrs.			Marks: 35
1.	Estimate the amount of RNA	A present in the given sa	mple by orcinol method.	
	Principle and Procedure		04Marks	
	Conduct of Experiment		08Marks 15 Marks	
	Report		3 Marks	•
2.	Isolation of casein from m	ilk.		
	Principle and Procedure		3 Marks	
	Conduct of Experiment		5 Marks 10 Marks	Ţ
	Report		2 Marks	•
3.	Practical Record		5 Marks	
4.	Viva Voice		5 Marks	
		TOTAL	35 Marks	

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P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM BIOCHEMISTRY SYLLABUS WITH EFFECTIVE FROM (2015-2016) III SEMESTER PAPER - II ENZYMOLOGY AND BIOPHYSICAL TECHNIQUES

COURSE CODE – BC3212

CREDITS-3

Hrs: 4 INSTRUCTIONAL OBJECTIVES:

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

MODULE- I

Introduction to biocatalysis, Nomenclature and classification of enzymes. Enzyme specificity. Active site. Interaction between enzyme and substrate- lock and key, induced fit models. Definition of holo-enzyme, apo-enzyme, coenzyme, cofactor. Factors affecting the catalysis- substrate concentration, pH, temperature.

MODULE -II

Michaelis - Menten equation for uni-substrate reaction (derivation not necessary), significance of $K_{\rm M}$ and $V_{\rm max}$. Enzyme inhibition- irreversible and reversible, types of reversible inhibitions- competitive and non-competitive.

allosteric enzyme.. Isoenzymes (LDH). Multienzyme complexes (PDH). Ribozyme Enzyme uni

MODULE-III

Methods of tissue homogenization: (Potter-Elvejham, mechnical blender, sonicator and enzymatic).

Principle and applications of centrifugation techniques- differential, density gradient centrifugation. Ultra-centrifugation- preparative and analytical.

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

MODULE -- IV

Electrophoresis- principles and applications of paper, polyacrylamide (native and SDS) and agarose gel electrophoresis.

Colorimetry and Spectrophotometry- Laws of light absorption- Beer-Lambert law. UV, visible absorption spectra, molar extinction coefficient, Principle of fluorimetry

Tracer techniques: Radio isotopes, units of radio activity, half life, β and γ - emitters, use of radioactive isotopes in biology.

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2015-2016) II B.Sc. BIOCHEMESTRY IIISEMESTER ENZYMOLOGY AND BIOPHYSICAL TECHNIQUES

MODEL QUESTION PAPER

Time: 3 hrs.

Marks: 70

PART - I

Note:Answer any <u>THREE</u> questions choosing at least one question from each Section. 10 x 3 = 30

SECTION-A

1. Write the factors affecting the enzyme catalysis.

2. Write an account on enzyme classification.

3.Write an essay on enzyme inhibition.

SECTION-B

4.Write the principle and application of affinity chromatography

5.Explain in detail SDS-PAGE

6.Write an essay on applications of radio isotopes in biology

PART-II

Answer any FIVE questions.

- 7 Enzyme specificity and active site
- 8 Lock and key mechanism of enzyme substrate reaction
- 9 Michaelis-Menten equation
- 10 Tissue homogenization
- 11 Principle of fluorimetry
- 12 Paper chromatography
- 13 Beer-lamberts law

5x4=20 Marks

14 Multienzyme complexes.

PART-III

Answer any TEN questions

- 15. Cofactor
- 16. Holo enzyme
- 17.Enzyme units
- 18. Significance of Km
- 19. Isoenzyme
- 20. Partition coefficient
- 21. Principle of centrifugation
- 22. Sonicator
- 23. Electrophoresis
- 24. Molar extinction coefficient
- 25. Radioisotopes
- 26. Half life

10x2=20 M

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM (2015-2016) II B.Sc. BIOCHEMISTRY III SEMESTER PAPER II ENZYMOLOGY AND BIOPHYSICAL TECHNIQUES BLUE PRINT FOR QUESTION PAPER SETTER

Time: 3hours

Max marks: 70

MODULE NO.	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 4 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTED TO THE UNIT	
MODULE – I	02	02	03	34	
MODULE – II	01	02	03	24	
MODULE – III	01	02	03	24	
MODULE – IV	02	02	03	34	
Total no. of Questions	06	08	12		
Total Marks including choice					

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

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P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM BIOCHEMISTRY SYLLABUS (WITH EFFECTIVE FROM 2015-2016) IV SEMESTER BIOENERGITICS AND METABOLISM

COURSE CODE – BC 4212 CREDITS-3

Hrs:4

INSTRUCTIONAL OBJECTIVES:

- 1. This course aims at the biological energy transformations
- **2.** This also impartsknowledge about metabolism of carbohydrates fatty acids amino acids, nucleic acids and porphyrins.

MODULE –I

Energy transformations in the living system, Free energy concept. Exergonic and endergonic reactions. High energy compounds.. Substrate level phosphorylation.

Biological oxidations: Definition, enzymes involved- oxidases, dehydrogenases and oxygenases. Redox reactions. Ultra structure of mitochondria. Electron transport chain and carriers involved. Oxidative phosphorylation, theories of oxidative phosphorylation-Mitchell's chemiosmotic theory. F_0 F_1 - ATPase.Inhibitors of respiratory chain and oxidative phosphorylation, uncouplers

MODULE-II

Concept of anabolism and catabolism. Glycolytic pathway, energy yield. Fate of pyruvate- formation of lactate and ethanol, Pasteur effect. Citric acid cycle, regulation, energy yield, amphipathic role. Anaplerotic reactions. Glycogenolysis and glycogenesis. Pentose phosphate pathway. Gluconeogenesis. Photosytnthesis- Light and Dark reactions, Calvin cycle, C_4 Pathway.

MODULE -III

Catabolism of fatty acids (β - oxidation) with even and odd number of carbon atoms, Ketogenesis, *de novo*synthesis of fatty acids, Biosynthesis and degradation of triacylglycerol and lecithin. Biosynthesis of cholesterol.

General reactions of amino acid metabolism- transamination, decarboxylation and deamination, Urea cycle and regulation, Catabolism of carbon skeleton of amino acids-glycogenic and ketogenic amino acids. Metabolism of glycine, serine, aspartic acid, methionine, phenylalanine and leucine. Biosynthesis of creatine. Inborn errors of aromatic and branched chain amino acid metabolism.

sMODULE -IV

Biosynthesis and regulation of purine and pyrimidine nucleotides, *de novo* and salvage pathways. Catabolism of purines and pyrimidines. Biosynthesis of

deoxyribonucleotides- ribonucleotide reductase and thymidylate synthase and their significance. Disorders of nucleotide metabolism- Gout, Lesch- Nyhan syndrome. Biosynthesis and degradatio

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2015-2016) IV SEMESTER PAPER-II

BIOENERGITICS AND METABOLISMMODEL QUESTION PAPER Time: 3 hrs. Marks:70

PART - 1

Note:Answer any <u>THREE</u> questions choosing at least one question from each Section. 10 x 3 = 30M

SECTION-A

1.write an essay on high energy compounds

2.Write an accout on mitochondrian electron transport chain

3.Describe citric acid cycle and its regulation

SECTION-B

4. Explain the urea cycle and its regulation.

5.Explain the biosynthesis of purines by denovo pathway.

6. Give a detailed account on biosynthesis of cholesterol

PART-II

Answer any **FIVE** questions.

7.Gluconeogenesis

8.C4 pathway

9. Synthesis of triglycerides

10.Ketogenesis.

11. Decarboxylation reaction of amino acid metabolism.

12. Biosynthesis of creatinine

13.Lesch-nyhan syndrome.

5x4=20 Marks

14. Ribonucleotide reductase.

PART-III

Answer any TEN questions.

10x2=20 Marks

15.Anaplerotic reactions

16.RUBP

- 17.Glycogenolysis
- 18. Anabolisms
- 19.Pasteur effect
- 20. Phenylketonuria
- 21. Transamination
- 22.Serine
- 23.Glucogenic and Ketogenic amino acids.
- 24.Thymidilate synthase.
- 25.Gout.
- 26.Regulation of pyrimidine synthesis.

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2015-2016) II B.Sc. BIOCHEMISTRY, IV SEMESTER

BIOENERGITICS AND METABOLISM

BLUE PRINT FOR QUESTION PAPER SETTER

Time : 3hours

Max marks: 70

MODULE NO.	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 4 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTED TO THE UNIT
MODULE – I	01	03	03	28
MODULE – II	02	01	03	30
MODULE – III	01	02	03	24
MODULE – IV	02	02	03	34
Total no. of Questions	06	08	12	
Tot	al Marks includ	ing choice	L	116

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

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P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2015-2016) II B.Sc- BIOCHEMISTRY– PRACTICAL SYLLABUS

AT THE END OF IV SEMESTER

Quantitave analysis, enzymology and bio physical techniques

Hrs:2

COURSE CODE – BC 4212P CREDITS-2

List of practical: Quantitative analysis and enzymology.

- 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 total carbohydrates by anthrone method.
- 6. Assay of amylase
- 7. Separation of amiono acids by paper chromatography
- 8. Separation of plant pigments by column chromatography
- 9. Polyacrsylamide gel electrophoresis of serum proteins
- 10. Absorption maxima of colored substances- *p*-Nitrophenol, Methyl orange.
- 11. Absorption spectra of protein-BSA

12.Effect of Temperature on enzyme activity on calculation of energy of activation.

P.R.GOVERNMENT COLLEGE(A) KAKINADA. <u>BIOCHEMISTRY PRACTICAL EXAMINATION.</u> <u>AT THE END OF SEMESTER-IV</u> <u>MODEL PAPER AND SCHEME OF VALUATION</u> PAPER II-Quantitave analysis, enzymology and bio physical techiniques

Time: 3Hrs

Maximum Marks:70

I.Estimation of Carbohydrate by Anthrone method.

	Principle and Procedure		10 Marks		•
	Conduct of Experiment		20Marks	35 Marks	
	Report		5 Marks		•
2.Assay o	of Amylase.				
	Principle and Procedure		5 Marks		•
	Conduct of Experiment		10 Marks	20 Marks	Ţ
	Report		5 Marks		
3.Practical Record			10 Marks		
4.Viva Vo	oice		5 Marks		
		TOTAL	70 Mark	(S	

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM BIOCHEMISTRY SYLLABUS (WITH EFFECTIVE FROM 2015-2016) <u>SEMESTER – IV</u> <u>GENERAL ELECTIVE</u> NUTRITION AND CLINICAL BIO CHEMISTRY

Hrs:3

CREDITS-2

INSTRUCTIONAL OBJECTIVES:

MODULE –I

Balanced diet. Calorific values of foods and their determination by bomb calorimeter. BMR and factors affecting it.Biological value of proteinsMalnutrition- Kwashiorkar, Marasmus and PEM. Obesity and starvation. Vitamins –sources ,structure,biochemical roles, deficiency disorders of water and fat soluble vitamins

MODULE –II

Blood fluid portion-plasma, serum,formed elements of blood –RBC,WBC,Platelets. Blood clotting, disorders of blood coagulation(hemophiolia). Haemoglobin-Transport of gases by Haemoglobin. Anemia-definition types of anemia . Bleeding time ,clotting time .ABO blooding grouping.

Structure and functions of the liver. Liver diseases-jaundice, hepatitis, cirrhosis. Liver function tests- conjugated and total bilurubin in serum, albumin: globulin ratio, hippuric acid and bromsulphthalein tests.

MODULE –III

Kidneys-structure of nephron, urine formation, normal and abnormal constituents of urine. Renal function tests- creatinine and urea clearance tests, phenol red test.

Disorders of carbohydrate metabolism- hypoglycemia, hyperglycemia, glycosuria, *Diabetes mellitus*-classification, glucose tolerance test (GTT),Biochemical tests for the diagnosis of heart diseases- HDL/LDL cholesterol.Disorders of lipid metabolism, fatty liver, atherosclerosis.

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2015-2016) <u>SEMESTER IV</u> BLUE PRINT FOR QUESTION PAPER SETTERS NUTRITION AND CLINICAL BIO CHEMISTRY

Time : 3hours

Max marks: 70

UNIT NO. & NAME	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 4 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTED TO THE UNIT
MODULE – I	01	02	03	24
MODULE – II	02	02	03	34
MODULE – III	01	02	03	24
MODULE-IV	02	02	03	34
Total no.of Questions	06	08	12	
Total Marks including choice				

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

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM BIOCHEMISTRY SYLLABUS (WITH EFFECTIVE FROM 2016-2017) SEMESTER – V PHYSIOLOGY AND NUTRITION(ADVANCED CORE) COURSE CODE – BC 5223

Hrs: 4 INSTRUCTIONAL OBJECTIVES:

CREDITS-3

1. This gives an insight into the digestion and absorption and physiology of heart and muscle 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.

MODULE-I

Digestion and absorption of carbohydrates, lipids and proteins. Composition of blood and coagulation of blood. Hemoglobin and transport of gases in blood (oxygen and CO₂).

Heart- structure of the heart, cardiac cycle, cardiac factors controlling blood pressure.Musclekinds of muscles, structure of myofibril, organization of contractile proteins and mechanism of muscle contraction.

MODULE -- II

Endocrinology- organization of endocrine system. Classification of hormones. Outlines of chemistry, physiological role and disorders of hormones of pancreas, thyroid, parathyroid, gonads, placenta, adrenals, pituitary and hypothalamus. Introduction of gastrointestinal hormones. Mechanism of hormonal action- signal transduction pathways for adrenaline, glucocorticoids and insulin.

MODULE -III

Balanced diet .Calorific values of foods and their determination by bomb calorimeter. BMR and factors affecting it. Specific dynamic action of foods. Energy requirements and recommended dietary allowance (RDA) for children, adults, pregnant and lactating women. Sources of complete and incomplete proteins.

MODULE -IV

Role of essential fatty acids in human nutrition.Malnutrition- Kwashiorkar, Marasmus and PEM. Obesity and starvation.

Vitamins- sources, structure, biochemical roles, deficiency disorders of water and fat soluble vitamins. functional foods. Bulk and trace elements-Ca, Mg, Fe, Cu, MoSeandF. Obesity and starvation.

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2016-2017) <u>SEMESTER V</u> PHYSIOLOGY AND NUTRITION

MODEL QUESTION PAPER

Time: 3hrs

PART - I

Marks: 70

Note : - Answer any THREE questions choosing at leastONE question from each section.

<u>Section – A</u> 10x3=30

- 1. Describe the digestion and absorption of carbohydrates and proteins.
- 2. Explain the process involved in coagulation of blood.
- 3. Describe the chemistry and physiological role of posterior pituitary hormones.

Section – B

- 4. Define BMR. Discuss the factors affecting the BMR.
- 5. Determination of calorific value by bomb calorimeter
- 6. Describe the structure, biology and deficiency disorders of vitamin-A.

<u>PART – II</u>

Answer any **FIVE** questions

- 7. Composition of Blood
- 8. Obesity and starvation
- 9. Cardiac factors controlling blood pressure
- 10. Signal transduction of insulin
- 11. Disorders of thyroid hormones

12. SDA

- 13.Role of essential fatty acids in human nutrition
- 14. Sources of complete and incomplete proteins

5x4=20

<u>PART – III</u>

Answer any **TEN** questions

15. Gastric juice

16. Coagulation

17.ADH

18.Balanced diet

19.Contractile proteins

20. Glucocorticoids

21.Cardiac cycle

22.Trace elements

23. Vitamin-D

24.RDA

25.Protein energy malnutrition

26.Paratharmone.

10X2=20

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2016-2017) <u>SEMESTER V</u> PHYSIOLOGY AND NUTRITION

BLUE PRINT FOR QUESTION PAPER SETTERS

Time : 3hours

Max marks: 70

UNIT NO. & NAME	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 4 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTED TO THE UNIT
MODULE – I	01	02	03	24
MODULE – II	02	02	04	36
MODULE – III	01	01	02	18
MODULE – IV	02	03	03	38
Total no.of Questions	06	08	12	
Tot	116			

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

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM BIOCHEMISTRY SYLLABUS (WITH EFFECTIVE FROM 2016-2017) <u>SEMESTER – V</u> <u>ELECTIVE (ADVANCED)-1</u> <u>IMMUNOLOGY</u>

COURSE CODE – 5224A

Hrs:3

CREDITS-2

INSTRUCTIONAL OBJECTIVES:

- 1. To provide basic knowledge about organization of immune system and antibodies function and activity.
- 2. This also imparts knowledge about immunotechniques, vaccines and theory of graft rejection.

MODULE-I:

Organization of immune system. Cells and organs of the immune system- Thymus, Bone marrow, spleen, lymph node. Types of immunity- Innate and acquired immunity. Cell mediated and humoral immunity (T- and B- cells).

MODULE:II

Classification of immunoglobulins, Biological activity of immunoglobulins, structure of IgG. Isotopes, allotopes and idiotopes. Epitopes / antigenic determinants. Concept of haptens. Adjuvants. Theories of antibody formation- clonal selection theory. Monoclonal antibodies and their applications.

MODULE:III.

Antigen-antibody interactions: Antibody affinity and avidity .Precipitation reactions -Immunodiffusion, Radial immunodiffusion, double immunodiffusion, immunoelectrophoresis. Agglutination reactions-Hemeaglutination and complement fixation. Blood group antigens. Immunodiagnostics-RIA, ELISA. Fundamentals of graft rejection and MHC proteins.

P.R.GOVERNMENT COLLEGE (A), KAKINADA

CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2016-2017) <u>SEMESTER V</u> <u>ELECTIVE (ADVANCED)-1</u> <u>IMMUNOLOGY</u>

MODEL QUESTION PAPER

Time: 3hrs

PART - I

Marks: 70

Note : - Answer any THREE questions choosing at leastONE question from each section.

<u>SECTION – A</u>

10x3=30

- 1. Describe the cells of the immune system.
- 2. Explain in detail cell mediated immunity.
- 3. Describe the hybridoma technology of monoclonal antibodies.

<u>SECTION – B</u>

- 4. Explain ELISA and its types.
- 5. Explain the classification of immunoglobulins
- 6. Write the types of immunodiffusions.

<u>PART – II</u>

- Answer any **FIVE** questions
- 7. Innate immunity
- 8. Structure of IgG
- 9. Clonal selection theory
- 10. Antibody affinity and avidity
- 11. Radial immunodiffusion
- 12. Primary lymphoid organs.
- 13. Immunodiagnostics-RIA
- 14. Fundementals of graft rejection

5x4=20

<u>PART – III</u>

Answer any **TEN** questions 15.B-Cells

16. RIA

17.IgG

18.Secondary immune response

19.Blood group antigens

20.MHC

21.T-lymphocytes

22.Antibody

23. Adjuvant

24.Idiotopes

25.Acquired immunity

26. IgM.s

10X2=20

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2016-2017) <u>SEMESTER V</u> <u>ELECTIVE (ADVANCED)-1</u> <u>IMMUNOLOGY</u> BLUE PRINT FOR QUESTION PAPER SETTERS

Time : 3hours

Max marks: 70

UNIT NO. & NAME	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 4 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTED TO THE UNIT
MODULE – I	02	03	04	40
MODULE – II	02	02	04	36
MODULE – III	02	03	04	40
sTotal no.of Questions	06	08	12	
Tota	116			

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

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM BIOCHEMISTRY SYLLABUS (WITH EFFECTIVE FROM 2016-2017) <u>SEMESTER – V</u> <u>ELECTIVE (ADVANCED)-2</u> <u>CLINICAL BIOCHEMISTRY</u>

COURSE CODE – BC 5224B

Hrs:3

CREDITS-2

INSTRUCTIONAL OBJECTIVES:

In this students are informed about the clinical biochemistry where they come across liver ,kidney function tests & their structures, disorders of carbohydrates,lipid metabolism& biochemical tests for heart diseases,diagnosis etc.

MODULE-I

Plasma proteins in health and disease. Disorders of blood coagulation (haemophilia). Types of anemia, haemoglobinopathies-sickle cell anemia and thalassemias.

Structure and functions of the liver. Liver diseases-jaundice, hepatitis, cirrhosis. Liver function tests- conjugated and total bilurubin in serum, albumin: globulin ratio, hippuric acid and bromsulphthalein tests. Serum enzymes in liver diseases- SGPT, GGT and alkaline phosphatase.

MODULE-II

Kidneys-structure of nephron, urine formation, normal and abnormal constituents of urine. Biological buffers. Role of kidneys in maintaining acid-base and electrolyte balance in the body. Renal function tests- creatinine and urea clearance tests, phenol red test.

MODULE-III

Disorders of carbohydrate metabolism- hypoglycemia, hyperglycemia, glycosuria, renal threshold value. *Diabetes mellitus*-classification, glucose tolerance test (GTT), diabetic ketoacidosis.

Disorders of lipid metabolism- plasma lipoproteins, lipoproteinemias, fatty liver, hyper cholesterolemia, atherosclerosis.

Biochemical tests for the diagnosis of heart diseases- HDL/LDL cholesterol,

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2016-2017) <u>SEMESTER V</u> <u>ELECTIVE (ADVANCED)-2</u> <u>CLINICAL BIOCHEMISTRY</u>

MODEL QUESTION PAPER

Time: 3hrs

<u>PART - I</u>

Marks: 70

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

<u>Section – A</u>

10x3=30

- 1. Explain the functions of plasma proteins and their role in health and disease.
- 2. Discuss the biochemical parameters for the differential diagnosis of jaundice.
- 3. Describe the mechanism of urine formation.

Section – B

- 4. Write an account on renal function tests.
- 5. Explain diabetes mellitus and its types.
- 6. Describe the biochemical test for the diagnosis of heart disorders.

PART-II

Answer any **FIVE** questions

- 7. Serum enzymes in liver diseases
- 8. Nephron structure
- 9. Haemoglobinopathies
- 10. Biological buffers
- 11. Glucose tolerance test
- 12. Plasma lipoproteins
- 13. Structure and functions of liver
- 14. Biochemical parameters in atheroscelerosis.

5x4=20

PART – III

Answer any **TEN** questions **15.** Anemia

10X2=20

- **16.** Fatty liver
- **17.** C-reactive protein
- **18.** Thalassemais
- 19. SGOT
- **20.** HDl/LDL cholesterol
- **21.** Troponins
- 22. Hepatitis
- 23. Conjugated biliribun
- 24. A:G Ratio
- 25. Lipoprotein
- 26. Abnormal urine constituents.

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2016-2017) <u>SEMESTER V</u> <u>ELECTIVE (ADVANCED)-2</u> <u>CLINICAL BIOCHEMISTRY</u>

BLUE PRINT FOR QUESTION PAPER SETTERS

Time : 3hours

Max marks: 70

UNIT NO. & NAME	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 4 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTED TO THE UNIT
MODULE – I	02	03	05	42
MODULE – II	02	02	03	34
MODULE – III	02	03	04	40
Total no.of Questions	06	08	12	
Total Marks including choice				

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

P.R.GOVERNMENT COLLEGE (A), KAKINADA <u>CHOICE BASED CREDIT SYSTEM</u> (WITH EFFECTIVE FROM 2016-207) <u>III B.Sc- BIOCHEMISTRY</u> <u>SEMESTER – V</u> <u>PRACTICAL SYLLABUS</u> <u>PHYSIOLOGY AND NUTRITION</u> (ADVANCED CORE)

COURSE CODE:BC5223P

LIST OF EXPERIMENTS:

- 1. Estimation of calcium by titrimetry
- 2. Estimation of iron in apple juice by phenanthroline method.
- 3. Estimation of vitamin C by 2, 6 -dichlorophenol indophenol method.
- 4. Isolation of total lipids by gravimetric method.
- 5. Determination of iodine value of an oil.
- 6. Determination of acid value of an oil.
- 7. Isolation of glycogen from sheep liver.
- 8. Preparation of carotenes from carrots.
- 9. Estimation of copper in foods.

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2016-2017) III B.Sc- BIOCHEMISTRY

<u>SEMESTER – V</u> <u>PHYSIOLOGY AND NUTRITION(ADVANCED CORE)</u> PRACTICAL MODEL PAPER & SCHEME OF VALUATION.

Time:11/2Hrs Marks:35

Maximum

1. Estimation of vitamin-c by 2,6-dichlorophenol indophenol method.		
Principle and Procedure		04 Marks ▲
Conduct of Experiment		08Marks 15
Report		3 Marks ♥
2.Preparation of carotenes from	n carrot.	
Principle and Procedure		3 Marks
Conduct of Experiment		05 Marks 10 Marks
Report		2 Marks *
3.Practical Record		05 Marks
4. Viva Voice		05 Marks
	TOTAL	35 Marks
	_	

P.R.GOVERNMENT COLLEGE (A), KAKINADA <u>CHOICE BASED CREDIT SYSTEM</u> (WITH EFFECTIVE FROM 2016-2017) <u>III B.Sc- BIOCHEMISTRY</u> <u>SEMESTER – V</u> <u>PRACTICAL SYLLABUS</u> <u>IMMUNOLOGY</u> (ADVANCED ELECTIVE-1)

COURSE CODE: BC5224(A)P

LIST OF EXPERIMENTS:

- 1. Determination of A,B,O and Rh blood groups.
- 2. Ouchterlony immuno diffusion for detection of antigens.
- 3. Radial immune diffusion
- 4. Immuno electrophoresis
- 5. Enzyme linked immuno sorbent assay
- 6. Diagnostic test for typhoid fever
- 7. Pregnancy test.

P.R.GOVERNMENT COLLEGE (A), KAKINADA <u>CHOICE BASED CREDIT SYSTEM</u> (WITH EFFECTIVE FROM 2016-2017 <u>III B.Sc- BIOCHEMISTRY</u> <u>SEMESTER – V</u> <u>PRACTICAL SYLLABUS</u> <u>IMMUNOLOGY(ADVANCED ELECTIVE-1)</u> PRACTICAL MODELPAPER AND SCHEME OF VALUATION

Time:11/2Hrs

Maximum Marks:35

I. Determination of A,B,O an	d Rh blood groups	s in human beings.	
Principle and Procedure		04 Marks	
Conduct of Experiment		08 Marks 15 Ma	ırks
Report		3 Marks ◀	
2.Radial immune diffusion			
Principle and Procedure		3 Marks	
Conduct of Experiment		05 Marks 10 Ma	ırks
Report		2 Marks	
3.Practical Record		05 Marks	
4.Viva Voice		05 Marks	
	TOTAL 35 M		

P.R.GOVERNMENT COLLEGE (A), KAKINADA <u>CHOICE BASED CREDIT SYSTEM</u> (WITH EFFECTIVE FROM 2016-2017) <u>III B.Sc- BIOCHEMISTRY</u> <u>SEMESTER - V</u> <u>PRACTICAL SYLLABUS</u> <u>CLINICAL BIOCHEMISTRY</u> (ADVANCED ELECTIVE-2)

COURSE CODE: 5224(B) P

LIST OF EXPERIMENTS:

- 1. Estimation of glucose in blood.
- 2. Estimation of hemoglobin in blood.
- 3. Total count RBC and WBC. Differential count.
- 4. Urine analysis for albumin, sugars and ketone bodies.
- 5. Estimation of serum creatinine.
- 6. Estimation of blood urea.
- 7. Estimation of serum total cholesterol.
- 8. Determination of serum alkaline phosphatase activity.
- 9. Determination of SGOT and SGPT activity

P.R.GOVERNMENT COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
(WITH EFFECTIVE FROM 2016-2017)
III B.Sc- BIOCHEMISTRY
SEMESTER – V
CLINICAL BIOCHEMISTRY
(ADVANCED ELECTIVE-2)
PRACTICAL MODEL PAPER AND SCHEME OF VALUATION

Time:1 1/2Hrs Marks:35 Maximum

15 Marks

1. Estimation of serum creatinine by jaffes method.

Principle and Procedure--

Conduct of Experiment

Report

2. Determination of blood group and Rh typing.

Principle and Procedure--

Conduct of Experiment

Report

3. Practical Record

4. Viva Voice

3 Marks 05 Marks 2 Marks

05 Marks

04 Marks

08 Marks

3 Marks

05 Marks

TOTAL

35 Marks

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2016-2017) <u>III B.SC SEMESTER – VI</u> <u>(SKILL BASED CORE)</u> <u>CELL BIOLOGY &MOLECULAR BIOLOGY</u>

COURSE CODE – BC 6223

Hrs:3

CREDITS-3

INSTRUCTIONAL OBJECTIVES:

This is to provide knowledge about protein synthesis & their events, regulation of gene expression

MODULE-I

Cells as basic unitsof livingorganisms. Ultra structure of prokaryotic and eukaryotic cells andcell organells. Celldivision and cell cycle. Chromosome organization in prokaryotes andeukaryotes. Nature and structure of the gene.

MODULE-II

Experimental evidences to prove nucleic acids as genetic material. DNA replicationmodels of replication, Meselson-Stahl's experimental proof for semi-conservative model. DNA polymerases I, II and III of *E.coli*, helicase, topoisomerases, primase, ligase. Bidirectional replication model. Okazaki fragments, leading and lagging strands of DNA synthesis. Inhibitors of DNA replication

MODULE-III

Transcription - RNA synthesis, RNA polymerases of prokaryotes. Promoters, Initiation- sigma factors and their recognition sites. Elongation- role of core enzyme. Termination- Rho dependent and Rho independent. RNA polymerase I, II and III of eukaryotes.

Transcriptional events in eukaryotic m-RNA synthesis, post-transcriptional modifications of eukaryotic m-RNA. Inhibitors of RNA synthesis **MODULE-IV**

Introduction to protein synthesis- Genetic code, structure of t-RNA, deciphering of genetic code, Nirenberg's and Khorana's experiments, wobble hypothesis, degeneracy of genetic code.

Protein synthesis- activation of amino acids (aminoacyl t-RNA synthetases). Ribosome structure. Initiation, elongation and termination of protein synthesis. Posttranslational modifications- signal hypothesis. Inhibitors of protein synthesis.

P.R.GOVERNMENT COLLEGE (A), KAKINADA <u>CHOICE BASED CREDIT SYSTEM</u> (WITH EFFECTIVE FROM 2016-2017) <u>IIIB.SC,SEMESTER VI</u> <u>MODEL QUESTION PAPER</u> SKILL BASED CORE: CELL BIOLOGY &MOLECULAR BIOLOGY

Time: 3 hrs.

70M

PART-I

Note :Answer any <u>THREE</u> questions choosing at least one question from each section $10 \ge 3 = 30$

SECTION A

- 1. Describe the ultra structure of Eukaryotic cell.
- 2. Write the experiments to prove DNA as genetic material.
- 3. Explain the process of replication in prokaryotes.

SECTION B

- 4. Explain the post transcriptional events in eukaryotic mRNA.
- 5. What is genetic code? Explain the properties of genetic code.
- 6. Describe the process of protein synthesis in prokaryotes.

<u>PART – II</u>

Answer any **FOUR** question

- 7. Mitotic cell division
- 8. Nature and structure of gene
- 9. Messelson's and stahl's experiment.
- 10. Bidirectional replication
- 11. Inhibitors of RNA synthesis
- 12. RNA polymerases of prokaryotes
- 13. Wobble hypothesis
- 14. Post translational modifications.

5x4=20

Marks;

<u>PART – III</u>

Answer any **TEN** Questions

- 15. Ribosome
- 16. Structure of mitochondria.
- 17. Ligase
- 18. Okazaki fragments
- 19. Promoter
- 20. Topoisomerase
- 21. Structure of t-RNA
- 22. Leptotene
- 23. S phase
- 24. Endoplasmic reticulum
- 25. Lagging strand
- 26. Stop codons

10x2=20

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2016-2017) <u>SEMESTER VI</u> <u>SKILL BASED CORE</u> <u>CELL BIOLOGY AND MOLECULAR BIOLOGY</u> BLUE PRINT FOR QUESTION PAPER SETTERS

Time : 3hours

Max marks: 70

UNIT	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 4 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTED TO THE UNIT
MODULE – I	01	02	03	24
MODULE – II	02	02	03	34
MODULE – III	01	02	03	24
MODULE-IV	02	02	03	34
Total no.of Questions	06	08	12	
Total Marks including choice				

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

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2016-2017) <u>SEMESTER – VI</u> <u>SKILL BASED ELECTIVE-1</u> <u>MICROBIOLOGY</u>

COURSE CODE – BC 6224A

Hrs:4

CREDITS-2

INSTRUCTIONAL OBJECTIVES:

- 1. To provide basic knowledge about microbial classification, and cultivation methods.
- 2. To know about bacterial reproduction and biology of viruses.

MODULE-I

Introduction to brief history of microbiology. Classification of microorganismsprokaryotic and eukaryotic microorganisms. Structure and general characteristics of bacteria, algae and fungi.Methods of sterilization.Types of culture media, Isolation and cultivation of bacteria.

MODULE –II

Bacterial reproduction, growth curve and kinetics of growth. Batch, continuous and synchronous cultures. Gram's staining- Gram positive and Gram negative bacteria, motility and sporulation. Industrial uses of *Aspergillus niger*, yeast .

MODULE –III:

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

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2016-2017) <u>MICROBIOLOGY</u> <u>SEMESTER – VI</u> <u>SKILL BASED ELECTIVE-1</u> <u>MODEL QUESTION PAPER</u>

Time: 3hrs

70M

PART -I

Note : - Answer any THREE questions choosing atleast ONE question from each section.

Section – A

10x3=30M

1. Write the classification of micro organisms.

2. Write the methods of sterilization of bacteria.

3. Explain the bacterial growth curve and kinetics of growth.

Section – B

4. Describe the gram staining process indetail.

5. Describe the lytic and lysogenic cycles of lambda phage.

6. Write in detail about viral disease hepatitis.

PART - II

Answer any FIVE questions

- 7. Isolation and cultivation of bacteria.
- 8. Ultra structure of bacteria
- 9. Industrial uses of yeast
- 10. Selective and enriched media
- 11. Batch and continuous culture.
- 12. Structure and composition of viruses.
- 13. Isolation of bacterial plaques.
- 14. Bacterial motility.

5x4=20M

Marks:

PART - III

Answer any **TEN** questions

10X2=20M

15. Pure culture

- **16.** Molds
- **17.** Gram positive bacteria
- 18. Transport media
- **19.** Aspergillus niger
- **20.** Transformation
- **21.** Mycoplasma
- **22.** HIV
- **23.** Synchronous growth
- 24. Eukaryote
- **25.** Conjugation
- **26.** Dengue.

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2016-2017) <u>SEMESTER VI</u> <u>SKILL BASED ELECTIVE-1</u> <u>MICROBIOLOGY</u>

BLUE PRINT FOR QUESTION PAPER SETTERS

Time : 3hours

Max marks: 70

UNIT NO. & NAME	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 4 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTED TO THE UNIT
MODULE – I	02	03	04	40
MODULE – II	02	03	04	40
MODULE – III	02	02	04	36
Total no.of Questions	06	08	12	
Total Marks including choice				

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

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM BIOTECHNOLOGY SYLLABUS (WITH EFFECTIVE FROM 2016-2017) SEMESTER – VI SKILL BASED ELECTIVE -2 REGULATION OF GENE EXPRESSION AND GENETIC ENGINEERING

COURSE CODE: BC6224B

Hrs:3

CREDITS-2

MODULE -I

Regulation of prokaryotic gene expression- induction and repression. Structure and function of lac operon- a negative control system. Catabolite repression- a positive control system. Function and regulation of tryptophan operon.

MODULE -- II

Outlines of cloning strategies. DNA sequencing- Maxam Gilbert and Sanger's methods. Tools of r-DNA technology: Enzymes- Restriction endonucleases, ligase, phosphatases, reverse transcriptase, polynucleotide kinases, terminal transferase nucleases- S_1 and RNAase H.Cloning vectors- Plasmids, Ti plasmids, Cosmids, λ phages, shuttle vectors, expression vectors

MODULE -III

Construction of c-DNA and genomic libraries. Isolation and sequencing of cloned genes- colony hybridization, nucleic acid hybridization, reporter genes [β - galactosidases, green fluorescent proteins (GFP)]. Polymerase chain reaction- Principle and applications. Outlines of Blotting techniques-Southern, Northern and Western.

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM BIOTECHNOLOGY SYLLABUS (WITH EFFECTIVE FROM 2016-2017) SEMESTER VI SKILL BASED ELECTIVE-2

REGULATION OF GENE EXPRESSION AND GENETIC ENGINEERING.

Time: 3 hrs.

Marks: 70

PART-I

Note :Answer any <u>THREE</u> questions choosing at least one question from each section 10 x 3

= **30M**

SECTION A

- 1. Write in detail about lac-operon
- 2. Write the Maxum-Gilbert method of DNA sequencing.
- 3. Define vector? Explain different types of vectors.

SECTION B

- 4. Explain the construction of C-DNA and genomic libraries.
- 5. Write the principle and applications of PCR technology.
- 6. Describe in detail of Blotting techniques

<u>PART – II</u>

Answer any **FIVE** question

5x4=20M

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- 7. Attenuation of trpoperon
- 8. Regulation of gene expression- Induction
- 9. Sanger's dideoxy method of sequencing
- 10. Restriction endonucleases
- 11. Southern blotting
- 12. Colony hybridization
- 13. Types of vectors.
- 14. GFP

<u>PART – III</u>

Answer any **TEN** Questions

10x2=20M

- 15. Operon
- 16. Expression vector
- 17. Ligase
- 18. Cosmid
- 19. Repression
- 20. PDB
- 21. Probe
- 22. Reverse transcriptase
- 23. c-DNA
- 24. r-DNA
- 25. Shuttle vector
- 26. Cosmid

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2016-2017) <u>SEMESTER VI</u> <u>SKILL BASED ELECTIVE-2:</u> REGULATION OF GENE EXPRESSION AND GENETIC ENGINEERING

BLUE PRINT FOR QUESTION PAPER SETTERS

Time : 3hours

Max marks: 70

UNIT NO. & NAME	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 4 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTED TO THE UNIT
MODULE – I	02	02	04	36
MODULE – II	02	03	04	40
MODULE – III	02	03	04	40
Total no.of Questions	06	08	12	
Total Marks including choice				116

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

P.R.GOVERNMENT COLLEGE (A), KAKINADA <u>CHOICE BASED CREDIT SYSTEM</u> (WITH EFFECTIVE FROM 2016-2017) <u>III B.Sc- BIOCHEMISTRY</u>

<u>SEMESTER - VI</u> <u>PRACTICAL SYLLABUS</u> <u>CELL BIOLOGY AND MOLECULAR BIOLOGY</u> <u>(SKIL BASED CORE)</u>

COURSE CODE:BC6223P

LIST OF EXPERIMENTS:

- 1. Mitosis in onion root tip cell
- 2. Meosis in onion flower buds
- 3. Isolation of DNA from onion/liver/coconut endosperm
- 4. Isolation of RNA fromyeast cells
- 5. Estimation of DNAby Diphenyl amine method
- 6. Estimation of RNA by orcinol method
- 7. Determination of purity of nucleic acids by UV Spectrophotometric method
- 8. Determination of melting temperature(Tm) of DNA.

P.R.GOVERNMENT COLLEGE (A), KAKINADA <u>CHOICE BASED CREDIT SYSTEM</u> (WITH EFFECTIVE FROM 2016-2017) <u>III B.Sc- BIOCHEMISTRY</u> <u>SEMESTER – VI</u> <u>CELL BIOLOGY AND MOLECULAR BIOLOGY</u> (SKILL BASED CORE) PRACTICAL MODEL PAPER AND SCHEME OF VALUATION

Time:11/2Hrs Marks:35 Maximum

1.Estimation of DNA by Diphenyl	aminemethod.		
Principle and Procedure		04 Marks	•
Conduct of Experiment		08 Marks	15 Marks
Report		03Marks	4 ↓
2. Mitosis in onion root tip cell.			
Principle and Procedure		03 Marks	A
Conduct of Experiment		05 Marks	10 Marks
Report		2 Marks	¥
3. Practical Record		05 Marks	
4. Viva Voice		05 Marks	
	TOTAL	35 Mar	ks

P.R.GOVERNMENT COLLEGE (A), KAKINADA <u>CHOICE BASED CREDIT SYSTEM</u> (WITH EFFECTIVE FROM 2016-2017) <u>III B.Sc- BIOCHEMISTRY</u> <u>SEMESTER – VI</u> <u>PRACTICAL SYLLABUS</u> <u>MICROBIOLOGY</u> (SKILL BASED ELECTIVE-1)

COURSE CODE:BC6224(A)P

LIST OF EXPERIMENTS:

- 1. Preparation of culture media
- 2. Sterilization methods
- 3. Isolation of bacteria by streak plate method.
- 4. Isolation of pure cultures by serial dilution method
- 5. Simple staining
- 6. Gram staining
- 7. Motility of bacteria by hanging drop method
- 8. Bacterial growth curve
- 9. Bacteriological examination of milk.(MBRT)
- 10. Analysis of domestic and industrial effluents- BOD
- 11. Antibiotic sensitivity test by paper disc method.

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2016-2017) III B.Sc- BIOCHEMISTRY

<u>SEMESTER – VI</u> <u>MICROBIOLOGY(SKILL BASED ELECTIVE-1)</u> <u>PRACTICAL MODEL PAPER AND SCHEME OF VALUATION</u>

Maximum

1. Gram staining Principle and Procedure--04 Marks 08 Marks 15 Marks Conduct of Experiment 3 Marks Report 2.Methylene blue reductase test Principle and Procedure--03 Marks 05 Marks 10 Marks Conduct of Experiment Report 2 Marks 3. Practical Record 05 Marks 4. Viva Voice 05 Marks TOTAL 35 Marks

Time:1 1/2Hrs

Marks:35

P.R.GOVERNMENT COLLEGE (A), KAKINADA CHOICE BASED CREDIT SYSTEM (WITH EFFECTIVE FROM 2016-2017) III B.Sc- BIOCHEMISTRY

<u>SEMESTER – VI</u> <u>REGULATION OF GENE EXPRESSION AND GENETIC ENGINEERING</u> (SKILL BASED ELECTIVE-2) <u>PRACTICAL MODEL PAPER AND SCHEME OF VALUATION</u>

COURSE CODE:BC6224(B)P

LIST OF EXPERIMENTS:

- 1. Isolation of plasmids.
- 2. Estimation of plasmid DNAby UV spectrophotometric method.
- 3. Restriction digestion of lambda DNA
- 4. Electrophoresis of nucleic acids and visualization by methylene blue staining.
- 5. Preparation of competitive E.coli cells.
- 6. Transformation of bacteria.
- 7. Polymerase chain reaction
- 8. Southern blotting
- 9. Expression of cloned genes(GFP).

P.R.GOVERNMENT COLLEGE (A), KAKINADA <u>CHOICE BASED CREDIT SYSTEM</u> (WITH EFFECTIVE FROM 2016 - 2017) <u>III B.Sc- BIOCHEMISTRY</u> <u>SEMESTER – VI</u> <u>REGULATION OF GENE EXPRESSION AND GENETIC ENGINEERING</u> (SKILL BASED ELECTIVE-2) PRACTICAL MODEL PAPER AND SCHEME OF VALUATION

Time:1 1/2Hrs Maximum Marks:35 1. Isolation of plasmid DNA. Principle and Procedure 04 Marks 15 Marks Conduct of Experiment 08 Marks Report 3 Marks 2. Preparation of competent cells. Principle and Procedure 03 Marks 05 Marks 10 Marks Conduct of Experiment 02 Marks Report 3. Practical Record 05 Marks 4. Viva Voice 05 Marks TOTAL 35 Marks