

**SRR & CVR GOVERNMENT DEGREE COLLEGE  
(AUTONOMOUS)**

**Vijayawada 520004, KRISHNA DISTRICT**



**Minutes of the Meeting Board of Studies**

**Department of Biochemistry**

**Dated: 20-11-2020**

# **SRR & CVR GOVT. DEGREE COLLEGE (Autonomous)**



**Machavaram, VIJAYAWADA – 4, Krishna Dist, A. P.**

**Minutes of the meeting of the Upgradation of Syllabus U. G. (B.O.S.) in the Subject of Biochemistry A. Y.: 2020- 2021**

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The meeting of the Upgradation of Syllabus (B O S) in the subject of **BIOCHEMISTRY** was held on **20 November 2020**, in the department of **Biochemistry, SRR &CVR Govt. Degree College (Autonomous), Vijayawada- 520004.**

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The following members attended the meeting: (Blended)

1. Syed Vaziha Tahseen (In-charge of the Dept & Chairman, BOS)
  2. Dr. P.Kiranmayi, Assistant professor in Biochemistry , ANU (University Nominee)
  3. Mrs.B.Dorcas Vijaya Kumari, Lecturer in Biochemistry, WDC(A),Guntur(Subject Expert)
  4. Mrs.D.Vijaya Sree, Lecturer in Biochemistry, GCW(A),Guntur (S.E)
  - 5.Dr.Sk.Beebi, lecturer in chemistry, SRR & CVR GDC(A) (Member)
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## **Agenda:**

In the revised APSCHE guidelines the syllabus for biochemistry is not formulated, so the department decided to follow Krishna University syllabus with few suggested modifications defined by the board

Item 1: Approval of syllabus for Semester I and II.

Item 2: Revise the proposed syllabus for Semester III & V.

Item 2: Approval of Question paper blue print, model paper and Question bank.

Item 3: Approval of stipulated credits, workload, Internal marks breakup.

Item 4: Approval of the duration of the examination for 3 hours.

Item 5: Approval of list of paper setters and examiners

Item 6: Approval for bridge course of 6 hours duration

Item 7: Approval for UGC COP course CMLT, DMLT & ADMLT syllabus.

Item 8: Approval of Online Examination pattern in case COVID 19 doesn't subside at the time of Examinations (MCQs Pattern).

The Chairperson welcomed the members and had discussion on the Agenda. He / She appraised the members of the guidelines of the UGC, APSCHE, Krishna University and the CCE regarding the framing of Syllabus, etc., and the recommended evaluation ratio for internal and external examinations. The members discussed in detail the various aspects presented before them and unanimously resolved the following:

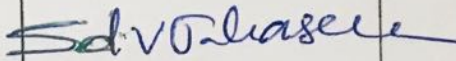
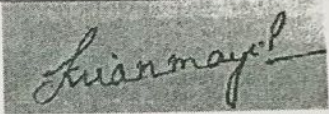
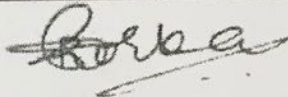
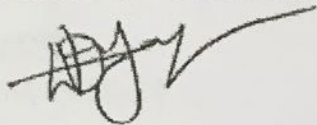
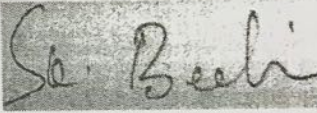
**Details of Members attended:**

| S No | Name, Designation   | Status of the Expert | Offline / Online/ Blended |
|------|---|----------------------|---------------------------|
| 1    | Syed Vaziha Tahseen, In-charge of the Dept                          | Chairman             | Offline                   |
| 2    | Dr.P.Kiranmayi, Assistant professor in Biochemistry , ANU           | University Nominee   | Online                    |
| 3    | Mrs.B.DorKa Vijaya Kumari, Lecturer in Biochemistry, GCW (A),Guntur | Subject Expert       | Online                    |
| 4    | Mrs.D.Vijayasree, Lecturer in Biochemistry, GCW (A),Guntur          | Subject Expert       | Online                    |
| 5    | Dr.Sk.Beebi, lecturer in chemistry, SRR & CVR GDC(A)                | Member               | Offline                   |

**The members of BOS Meeting Resolved:**

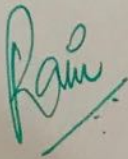
- Item 1: To Approve the syllabus with 20% modifications for Semester I and II for the academic year 2020-2021.
- Item 2: To Approve the proposed syllabus for Semester III & V with 20% modifications.
- Item 3: To Approve the validity of the syllabus for the next 2 years.
- Item 4: To Approve the Question paper, blue print, model paper and question bank.
- Item 5: To Approve the Internal assessment component
- Item 6: To Approve the list of paper setters and examiners
- Item 7. To approve bridge course syllabus and duration for 6 hrs.
- Item 8. To approve the COP MLT course syllabus
- Item 9: To approve the governing body resolutions, the examination time slot for theory exam is raised 2:30 hrs. to 3:00 hrs.
- Item 10: The autonomous question paper pattern 60 marks for theory examination and 40 marks for internal assessment are retained as it is.
- Item 11. For the practical examination 25 marks for internal assessment and 25 for external assessment are retained as it is.
- Item 12.: To follow the credits, workload per week, internals breakup, according to the standing instructions, APSCHE's guidelines, governing body's resolutions and examination department instructions.
- Item 13: In case the COVID 19 doesn't diminish at the time of semester end examination as per the directions of the principal and COE, examination department, the department is ready to adopt online examination in MCQ pattern.

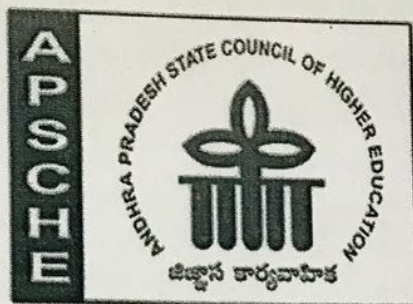
Signatures of the members of the BOS Meeting:

| S No | Name & Designation  | Status             | Signature   |
|------|---|--------------------|---|
| 1    | Syed Vaziha Tahseen, In-charge of the Dept                          | Chairman           |    |
| 2    | Dr.P.Kiranmayi, Assistant professor in Biochemistry , ANU           | University Nominee |    |
| 3    | Mrs.B.Dorka Vijaya Kumari, Lecturer in Biochemistry, GCW (A),Guntur | Subject Expert     |    |
| 4    | Mrs.D.Vijayasree, Lecturer in Biochemistry, (A),Guntur              | Subject Expert     |    |
| 5    | Dr.Sk.Beebi, lecturer in chemistry, SRR&CVR GDC(A)                  | Member             |  |

Counter signed by:

Principal  
SRR & CVR Govt Degree College (A)  
Vijayawada





**ANDHRA PRADESH STATE COUNCIL OF HIGHER  
EDUCATION**

(A Statutory body of the Government of Andhra Pradesh)

3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> floors, Neeladri Towers, Sri Ram Nagar, 6<sup>th</sup> Battalion Road,  
Atmakur(V), Mangalagiri(M), Guntur-522 503, Andhra Pradesh  
Web: [www.apsche.org](http://www.apsche.org) Email: [acapsche@gmail.com](mailto:acapsche@gmail.com)

**REVISED SYLLABUS OF B.Sc. (BIOCHEMISTRY)  
UNDER CBCS FRAMEWORK WITH EFFECT FROM 2020-21**

**PROGRAMME: THREE-YEAR B.Sc.**  
(BIOCHEMISTRY)

*(With Learning Outcomes, Unit-wise Syllabus, References, Co-curricular Activities  
& Model Q.P.)*

*For Fifteen Courses of 1, 2, 3 & 4 Semesters)*  
(To be Implemented from 2020-21 Academic Year)

Structure of BIOCHEMISTRY Syllabus  
(Under CBCS for 3-year B.Sc. Programme)

(With domain subject covered during the first 4 Semesters with 5 Courses)

| Year | Semester | Courses | Title of the Course   | Marks  | No.ofHrs/Week | No.ofCredits |    |  |  |  |
|------|----------|---------|---|--|---------------|--------------|----|--|--|--|
| I    | I        | I       | BCH-1<br>Biomolecules   | 100  | 4             | 03           |    |  |  |  |
|      |          |         | Practical – BCP-101<br>Qualitative Analysis                         | 50   | 2             | 02           |    |  |  |  |
|      | II       | II      | BCH-II<br>Analytical techniques                                     | 100  | 4             | 03           |    |  |  |  |
|      |          |         | Practical – BCP-201<br>Biochemical Techniques                       | 50   | 2             | 02           |    |  |  |  |
| II   | III      | III     | BCH-III<br>Enzymology, Bioenergetics and<br>Intermediary Metabolism | 100  | 4             | 03           |    |  |  |  |
|      |          |         | Practical – BCP-301<br>Quantitative analysis                        | 50   | 2             | 02           |    |  |  |  |
|      |          |         | BCH-IV<br>Physiology, Nutritional and<br>Clinical Biochemistry      | 100  | 4             | 03           |    |  |  |  |
|      |          |         | Practical – BCP-401<br>Nutritional and Clinical<br>Biochemistry     | 50   | 2             | 02           |    |  |  |  |
|      | V        | V       | V   | BCH-V<br>Microbiology, Immunology and<br>Molecular biology | 100           | 4            | 03 |  |  |  |
|      |          |         |   | Practical – BCP-501<br>Microbiology and Immunology         | 50            | 2            | 02 |  |  |  |
|      |          |         |   | Total No. of Courses: 05 (Five)                            |               |              |    |  |  |  |
|      |          |         |   |  |               |              |    |  |  |  |

**B.Sc. BIOCHEMISTRY SYLLABUS UNDER CBCS**

**I Year B.Sc.-Biochemistry:1 Semester**

**Course I: Biomolecules, Code: BCH-1**

**Work load: 60 hrs. per semester 4 hrs/week**

*Expected outcomes, On successful completion of this course:*

*The student gains knowledge in the chemistry of biomolecules such as water, carbohydrates, lipids, proteins and nucleic acids which make up all the living organisms including humans.*

*This will enable the student to understand the importance of these biomolecules in living organisms and effects of their alterations in diseases occurring in plants, animals and humans.*

*The practical's will give the expertise to the student for analysis of any biological or non-biological sample for identification of its chemical composition*

**Unit - I:**

**1. Biophysical Concepts 12 hours**

Water as a biological solvent, Buffers, measurement of pH, electrodes, Biological relevance of pH. pKa value, analysis of drinking water and pond water, Introduction to Different types of waters such as Potable water, Purified Water, Distilled Water, Deionized Water, RO Water, Water for Injection. Different Types of Waters used in the pharmaceutical industry, water for Vaccines. Total dissolved salts (TDS), BOD, COD, soil analysis (texture, organic matter, elements), Electrical conductivity.

**Unit - II:**

**2. Carbohydrates 12 hours**

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. Structure and biological importance of disaccharides (sucrose, lactose, maltose), structural polysaccharides (cellulose, chitin, pectin) and storage polysaccharides (starch, inulin, glycogen). Glycosaminoglycans, Bacterial cell wall polysaccharides, and Blood group substances. Galactomannans and their applications in modern foods.

**Unit - III:**

**3. Lipids 12 hours**

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. Prostaglandins- structure, types, and biological role. Lipoproteins- types and functions, Biomembranes- Membrane composition and organization - Fluid mosaic model. Formation of micelles, bilayers, vesicles, liposomes.

**Unit-IV:**

**4. Amino Acids and Proteins** 12 hours  
Amino Acids: Classification, structure, stereochemistry, chemical reactions of amino acids due to amino and amino groups. Titration curve of glycine and pK values. Essential and nonessential amino acids in protein amino acids. Peptide bond - nature and conformation. Naturally occurring peptides - glutathione, enkephalin.

Proteins: Classification based on solubility, shape, and function. Determination of amino acid composition of proteins. General properties of proteins, denaturation and renaturation of proteins. Secondary organization of proteins - primary, secondary, tertiary, and quaternary structures (Eg. Hemoglobin, Myoglobin). Ramachandran plot.

**Unit-V:**

**5. Nucleic acids and porphyrins** 12 hours  
Types of RNA and DNA. 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, denaturation and renaturation kinetics of nucleic acids,  $T_m$ -values and their significance,  $cot$  curves and their significance.

Structure of porphyrins: Identification of Porphyrins, Protoporphyrin, porphobilinogen and heme. Structure of metalloporphyrins - Heme, cytochromes and chlorophylls.

**Practical Course 1: Qualitative Analysis**

**Work load: 30 hrs. per semester**

**3 hrs.**

**Practical BCP- 201**

**List of experiments:**

Preparation of buffers (acidic, neutral and alkaline) and determination of pH.

1. Qualitative identification of carbohydrates - glucose, fructose, ribose/xylose, maltose, sucrose, lactose, starch/glycogen.
2. Qualitative identification of amino acids - histidine, tyrosine, tryptophan, cysteine, arginine.
3. Qualitative identification of lipids - solubility, saponification, acrolein test, Salkowski test, Liebermann-Burchard test.
4. Preparation of Osazones and their identification.
5. Absorption maxima of colored substances - p-Nitrophenol, Methyl orange.
6. Absorption spectra of protein - BSA, nucleic acids - Calf thymus DNA.

**Recommended books:**

1. Soil Testing Manual by Dr. G. S. Wagh.
2. Soil Testing and Plant Analysis: Part I Soil Testing, Volume 2. SSSA Special publications by W. Hardy.
3. Soil Analysis: An interpretation manual by K. I. Peverill, L. A. Sparrow, D. J. Reuter.
4. The biochemistry of Nucleic acids; Adams et al., Chapman and Hall, 1986.

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- Proteins: A guide to study by physical & chemical methods, Haschemeyer and Haschemeyer,  
Proteins: Structure, function and evolution. Dickerson & Geis, 2nd Edn, Benjamin/Cummings.  
Biochemistry - Zubay C, Addison - Wesley, 1986.  
Biochemistry, A problem Approach, 2nd Edn. Wood, W.B. Addison Wesley 1981.  
Biochemistry, Lehninger A.H.  
10. Textbook of Biochemistry West, E.S., Todd, Mason & Vanbruggen, Macmillian&Co.  
11. Principles of Biochemistry White-A, Handler, Pand Smith E.L. Mc Grew Hill.  
12. Organic chemistry, I.L. Finar, ELBS. (1985).  
13. Organic Chemistry by Morrison and Boyd (2000) Prentice Hall.  
14. Fundamentals of Biochemistry by Donald Voet (1999).  
15. Indian Pharmacopeia available in the pharmacy department

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BIOCHEMISTRY SYLLABUS FOR I SEMESTER

BIOMOLECULES

BLUE PRINT FOR QUESTION PAPER

| S.NO | TYPE OF QUESTIONS  | SA<br>4 marks      | SA<br>4 marks              | SA<br>4<br>marks | LA<br>8 marks              | LA<br>8<br>marks | Total<br>60<br>marks |
|------|--|--------------------|----------------------------|------------------|----------------------------|------------------|----------------------|
|      | UNITS  | Questions<br>given | Questions<br>To<br>attempt | Total<br>marks   | Questions<br>To<br>attempt | Total<br>marks   | Total<br>60<br>marks |
| 1    | <b>UNIT-1</b><br><u>Biophysical</u><br><u>concept</u>        | 1Q                 | STUDENT CHOICE             | 4M               | 1Q                         | 8M               | 16M                  |
| 2    | <b>UNIT-II</b><br><u>Carbohydrates</u>                       | 2Q                 |                            | 4M               | 1Q                         | 8M               | 16M                  |
| 3    | <b>UNIT-III</b><br><u>Lipids</u>                             | 3Q                 |                            | 4M               | 1Q                         | 8M               | 16M                  |
| 4    | <b>UNIT-IV</b><br><u>Aminoacids</u><br><u>and proteins</u>   | 2Q                 |                            | 4M               | 1Q                         | 8M               | 16M                  |
| 5    | <b>UNIT-V</b><br><u>Nucleic acids</u><br><u>and proteins</u> | 2Q                 |                            | 4M               | 1Q                         | 8M               | 16M                  |
|      | <b>Total</b><br>questions to<br>attempt                      | 5Q                 |                            | 20M              | 5Q                         | 40M              | 60M                  |

## B.Sc. BIOCHEMISTRY SYLLABUS UNDER CBCS

### I Year B.Sc.-Biochemistry: II Semester

Course II: Analytical techniques, Code: BCH-II

Work load: 60 hrs. per semester 4 hrs/week

#### Expected outcomes of the course BCH- II

The student will learn the various analytical techniques and their applications in separation and isolation of cells and tissues for studying their functional abnormalities

The knowledge in the analytical techniques will enable the student for isolation, purification and chemical characterization of compounds from plants and microbes which will have medical or commercial importance.

The practical's will provide the expertise to the student for quantification of electrolytes and other metal ions, hormones and identification of bacteria.

The expertise gained by the student in this course can be useful in food industries, pharma industries, clinical and microbiological labs.

#### Unit-I: Cell homogenization and centrifugation 12 hours

Introduction to types of Cells & Cell Lysis, methods of tissue homogenization: (Potter-Elvehjem, mechanical blender, sonicator and enzymatic). Centrifugation techniques, principles and applications- differential, density gradient. Ultra-centrifugation- preparative and analytical.

#### Unit-II: Chromatographic techniques

12 hours

Types of chromatographic techniques, Principle and applications - Paper chromatography- solvents, Rf value, applications; Thin layer chromatography- principle, choice of adsorbent and solvent, Rf value, applications; Gel filtration, Ion- exchange- principle, resins, the action of resins, experimental techniques, applications, separation of metal ions; Affinity chromatography. Introduction to HPLC

#### Unit-III: Spectroscopy and tracer techniques

12 hours

Electromagnetic radiation, Beer-Lambert's law. Introduction to Absorption & Emission spectroscopy Colorimetry and Spectrophotometry, spectrofluorimetry, flame photometry. Tracer techniques: Radioisotopes, units of radioactivity, half-life,  $\beta$ , and  $\gamma$ - emitters, use of radioactive isotopes in biology, ELISA, RIA.

#### Unit-IV: Electrophoresis

12 hours

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

#### Unit-V: Microbial techniques:

12 hours

Microscopy: Basic principles of light microscopy, phase contrast, electron microscope and fluorescent microscope and their applications.

Preparation of different growth media, isolation and culturing and preservation of microbes, Gram staining- Gram-positive and Gram-negative bacteria, motility and sporulation, Sterilization Techniques Physical methods, chemical methods, radiation methods, ultrasonic and. Antibiotic resistance. Application of Sterilization in the food & Pharmaceutical Industry.

### Practical Course 2: Biochemical Techniques

3 hrs./week

**Workload: 30 hrs. per semester**

#### Practical BCP- 201

##### List of Experiments:

1. Isolation of RNA and DNA from tissue/culture.
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.
9. Separation of serum proteins by paper electrophoresis.

##### Recommended books:

1. Principles and Techniques of practical Biochemistry. Eds. Williams and Wilson.
  2. Techniques in Molecular biology Ed. Walker & Gastra, Croom Helm, 1983.
  3. Principles of instrumental analysis, 2nd Ed, Holt-Sanders, 1980.
  4. An introduction to spectroscopy for Biochemistry. Ed. Brown S.N., Academic press
  5. Analytical Biochemistry, Holmes and Hazel peck, Longman, 1983.
  6. An introduction to practical biochemistry. David T. Plummer, Tata Mac Grew-Hill.
  7. Biophysical chemistry, Edshall & Wyman, Academic press Vol. II & I.
  8. A textbook of quantitative inorganic analysis including elementary instrumental analysis, Vogel
- ELBS.
9. Biochemical calculations Seigel, IH, 2nd Edit, John Wiley & sons Inc., 1983.
  10. Analytical Biochemistry by Friefelder David

**Biochemistry MODEL PAPER FOR II SEMESTER**

**Biochemistry - PAPER -II**

**Analytical techniques**

**Time : 3 hrs**

**Max. Marks : 60**

**Answer any FIVE of the following :**

**5×4 M=20 M**

**Part-A**

Each question carries **FOUR** marks.

1. Differential centrifugation
2. Affinity chromatography
3. TLC
4. Beer-Lambert law.
5. Absorption & Emission spectroscopy
6. Gel filtration.
7. Tracer techniques
8. Isoelectro focusing
9. RIA.
10. Gram +ve & Gram -ve bacteria

**Part-B**

Answer **ALL THE** following questions.

**5 X 8=40M**

Each question carries 8marks

11. Discuss about different methods used for tissue homogenization.

(or)

Principles and applications of Ultra centrifugation

12. Principles and applications of HPLC chromatography

(or)

Principles and applications of Ion exchange chromatography

13. Principles and applications of Spectrophotometry

(or)

Discuss applications of radioisotopes in biology

14. Principles and applications of Polyacrylamide electrophoresis

(or)

Define types and applications of immune electrophoresis.

15. Principles and applications of electron microscope

(or)

Discuss about sterilization techniques in detail.

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BIOCHEMISTRY SYLLABUS FOR II SEMESTER

ANALYTICAL SKILLS TECHNIQUES

BLUE PRINT FOR QUESTION PAPER

| S.NO | TYPE OF QUESTIONS   | SA<br>4 marks      | SA<br>4 marks              | SA<br>4<br>marks | LA<br>8<br>marks           | LA<br>8<br>marks | Total<br>60<br>marks |
|------|---|--------------------|----------------------------|------------------|----------------------------|------------------|----------------------|
|      | UNITS   | Questions<br>given | Questions<br>To<br>attempt | Total<br>marks   | Questions<br>To<br>attempt | Total<br>marks   | Total<br>60<br>marks |
| 1    | UNIT-1<br><u>Cell<br/>homogenization<br/>and<br/>centrifugation</u> | 1Q                 | STUDENT CHOICE             | 4M               | 1Q                         | 8M               | 16M                  |
| 2    | UNIT-II<br><u>Chromatographic<br/>techniques</u>                    | 2Q                 |                            | 4M               | 1Q                         | 8M               | 16M                  |
| 3    | UNIT-III<br><u>Spectroscopy and<br/>tracer techniques</u>           | 3Q                 |                            | 4M               | 1Q                         | 8M               | 16M                  |
| 4    | UNIT-IV<br><u>Electrophoresis</u>                                   | 2Q                 |                            | 4M               | 1Q                         | 8M               | 16M                  |
| 5    | UNIT-V<br><u>Microbial<br/>techniques</u>                           | 2Q                 |                            | 4M               | 1Q                         | 8M               | 16M                  |
|      | Total questions to<br>attempt                                       | 5Q                 |                            |                  | 20M                        | 5Q               | 40M                  |

## Practical examination pattern for semester end examination

### Practical – 1

Practical examination in dept. of Biochemistry is held before 1<sup>st</sup> and 2<sup>nd</sup> semester exams twice in a year to test practical skills among the students.

Total marks allotted for practical are 50 marks which are divided as 25 for internal and 25 for external for a duration of three hours in each semester.

The division of marks is as follows

#### External

| Major experiment | Minor experiment | To identify the instrument to give the working principle | Viva    |
|------------------|------------------|--|---------|
| 10 marks         | 5 marks          | $2 \times 2\frac{1}{2} = 5$ marks                        | 5 marks |

#### Internal

| Record   | Project viva | Continuous assessment |
|----------|--------------|-----------------------|
| 10 marks | 10marks      | 5 marks               |

## INTERNAL ASSESSMENTS

A total of 40 Marks is allotted for internals in Dept. of **Biochemistry**, which facilitate continuous assessment of students, to know their progress. It also facilitates the teacher to take necessary remedial activity for slow learners and to encourage the bright students by giving respective tasks.

**Mid Semesters:** Among the 40 marks of internals, 10 marks are given for common Written test as Mid sem exam. Two mid sem exams each of 25 marks will be conducted and the **average** is taken.

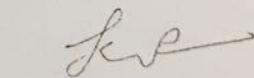
Two assignments are conducted for 10 marks, 5 marks will be given for each assignment

5 marks are allotted for Student Seminars and 5 marks are allotted for continuous assessment including viva/PPT

10 marks are allotted for project work

### Division of 40 Marks of Internal assessment :

| 1                                 | 2                                 | 3                           | 4                              | 5                | 6                                    | 5        | 6                       |
|-----------------------------------|-----------------------------------|-----------------------------|--------------------------------|------------------|--------------------------------------|----------|-------------------------|
| 1 <sup>st</sup> Mid semester exam | 2 <sup>nd</sup> Mid semester exam | Total of Mid semester exams | Assignments                    | Student Seminars | Continuous assessment including viva | project  | Total Marks of Internal |
| Written test                      | Written test                      | Average of 1 & 2 exams      | 2 Assignments each for 5 marks |                  |                                      |          |                         |
| 25marks                           | 25 marks                          | 10 marks                    | 10 marks                       | 5 marks          | 5 marks                              | 10 marks | 40 marks                |

  
 Ramesh  
 Jodha

## Panel of Examiners & Paper Setters

| S.No. | Name                     | Qualification        | Designation & Address  | Contact No. |
|-------|--------------------------|----------------------|--|-------------|
| 1.    | Dr. J. Rajeswari         | M.Sc., PhD           | Associate Professor,<br>Dept. of Biochemistry,<br>ANU, Guntur                  | 9494595897  |
| 2.    | Dr.P. Kiranmayi          | M.Sc. M.Phil.<br>PhD | Asst. Professor,<br>Dept. of Biochemistry,<br>ANU, Guntur                      | 9441748123  |
| 3     | B. Dorka Vijaya Kumari   | M.Sc.                | Lecturer<br>Dept. Biochemistry<br>, Govt. College for Women, Guntur            | 9963928874  |
| 4     | D.Vijaya Sree            | M.Sc.                | Lecturer<br>Dept. Biochemistry<br>Govt. College for Women                      | 7386417033  |
| 5     | A.Harika                 | M.Sc.                | Department of Biochemistry<br>SDMSMK, Vijayawada                               | 9490769898  |
| 6     | Dr.Alice                 | M.Sc. PhD            | Department of Biochemistry<br>Maris Stella College, Vijayawada.                | 9581771118  |
| 7     | Mr. K.Yesuratnam         | M.Sc., B.Ed.         | HOD, Dept. of Biochemistry<br>Vignan Degree College, Guntur.                   | 9440754416  |
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