Common Framework of CBCS for Colleges in Andhra Pradesh

(A.P. State of Council of Higher Education)

B.Sc., BIOCHEMISTRY

Course Structure, Scheme of Instruction and Examination, 2015

Semester Pattern

SEMESTER - II	Marks
Theory –BCT-201: Nucleic acids and Biochemical Techniques	**75**
Unit-I : Nucleic Acids	
Unit-II: Porphyrins	
Unit-III: Biochemical Techniques I	
Unit IV: Biochemical Techniques II	
Unit-V: Techniques employed in metabolic studies	
Practical – BCP-201 : Isolations and Biochemical Techniques	**50**

SEMESTER-II

60 hrs
(5 periods/week)

Theory: BCT-201 Nucleic acids and Biochemical Techniques

Unit-I : Nucleic Acids **12 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 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 RNA and DNA.

Unit-II: Porphyrins **9 hours**

Structure of porphyrins; Protoporphyrin, porphobilinogen properties Identification of Porphyrins. Structure of metalloporphyrins – Heme, cytochromes and chlorophylls.

Unit-III: Biochemical Techniques I **15 hours**

Methods of tissue homogenization: (Potter-Elvejham, mechnical blender, sonicator and enzymatic).
Principle and applications of centrifugation techniques- differential, density gradient. Ultra-centrifugation- preparative and analytical..
Principle and applications of chromatographic techniques- paper, thin layer, gel filtration, ion- exchange and affinity chromatography. Elementary treatment of an enzyme purification.
Electrophoresis- principles and applications of paper, polyacrylamide (native and SDS) and agarose gel electrophoresis.

Unit-IV: Biochemical Techniques II **12 hours**

Colorimetry and Spectrophotometry- Laws of light absorption- Beer-Lambert law. UV and visible absorption spectra, molar extinction coefficient, biochemical applications of spectrophotometer. Principle of fluorimetry.
Tracer techniques: Radio isotopes, units of radio activity, half life, β and γ- emitters, use of radioactive isotopes in biology.

Unit- V: Techniques employed in metabolic studies **12 hours**

Broad outlines of Intermediary metabolism, methods of investigation, Intermediary metabolism in vivo studies such as analysis of excretion, Respiratory exchange, Removal of organs and perfusion studies, in vitro studies such as tissue slice techniques; Homogenates and purified enzyme systems; isotope tracer studies, use of inhibitors and antimetabolites.

Practical BCP- 201 : Nucleic acids and Biochemical Techniques 45 hrs

List of Experiments: **(3 periods/week)**

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.
10. Separation of plant pigments by TLC.

MODEL QUESTION PAPER FOR END SEMESTER EXAM
B.Sc Degree Course
(Semester-II) Nucleic acids and Biochemical techniques

B.Sc Biochemistry

Timer: 3hrs **Max marks: 75**

Section-A (5X5=25 marks)
Attempt any **Five** of the following

1. Nucleotides.
2. r-RNA.
3. Chlorophyll.
4. Differential centrifugation
5. Principle in fluorimetry.
6. Tissue slice technique.
7. Applications of agarose gel electrophoresis.
8. Isotope tracer studies.

Section-B (10X5=50 marks)
Attempt all the following questions

9. What are the types of RNA and their role.

(OR)

10. Explain the double helical structure of DNA.

11. Describe structure and properties of porphyrins.

(OR)

12. Explain the properties of porphyrins and their identification methods.

13. Describe the principle and applications of density gradient centrifugation.

(OR)

14. Explain the principle and applications related to ion exchange chromatography

15. Explain the construction of spectrophotometer and its applications.

(OR)

16. What are the uses of Radio isotopes in medicine and biology.

17. How metabolic pathways are sequenced

(OR)

18. How to prepare the cell homogenate and purify the enzyme.