

**SRI VENKATESWARA UNIVERSITY**  
**B.Sc. DEGREE COURSE IN PARAMEDICAL TECHNOLOGY**  
**IV SEMESTER**  
**(Syllabus under CBCS w.e.f. 2021-22)**

**CLINICALBIOCHEMISTRY**

**Course Outcomes:** By the completion of the course the graduate should able to –

**CO1:**Describe the clinical bio chemistry of carbohydrates

**CO2:**Explain the clinical bio chemistry of proteins

**CO3:**Describe the clinical bio chemistry of lipds

**CO4:**Explain the chemistry and metabolism of enzymes

**CO5:**Differentiate hypoglycaemia from hyperglycaemia.

**Learning objectives**

1. To understand the clinical bio chemistry of carbohydrates .
2. To understand the clinical bio chemistry of proteins .
3. To understand the clinical bio chemistry of lipds.
4. To understand the chemistry and metabolism of enzymes .
5. To understand the hypoglycaemia and hyperglycaemia

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**CLINICALBIOCHEMISTRY**

**UNIT-I**

**Chemistry of carbohydrates & their related metabolism -**

- 1.1 Brief outline of Metabolism: Glycogenesis & Glycogenolysis (in brief)
- 1.2 Glycolysis, citric acid cycle & its significance
- 1.3 HMP shunt & Gluconeogenesis (in brief), regulation of blood glucose level, Metabolic disorders.

**UNIT -2**

**Chemistry of Proteins & their related metabolism -**

- 2.1 Brief outline of Metabolism: Transformation, Decarboxylation,
- 2.2 Ammonia formation & transport, Urea cycle, Metabolic disorders in urea cycle, catabolism of amino acids especially
- 2.3 Phenylalanine, Tyrosine & Tryptophan, Creatine, Creatinine, Proteinuria.

**UNIT -3**

**Chemistry of Lipids & their related metabolism -**

- 3.1 Introduction, definition, classification, biomedical importance, essential fatty acids.
- 3.2 Brief outline of metabolism:  $\beta$ - oxidation of fatty acids, fatty liver, Ketosis
- 3.3 Cholesterol & its clinical significance, Lipoproteins in the blood composition & their functions in brief, Atherosclerosis.

**UNIT- 4**

**Chemistry of Enzymes & their related Metabolism -**

- 4.1 Diagnostic value of serum enzymes -Creatinine kinase, Alkaline phosphatase, Acid phosphatase,
- 4.2 LDH, SGOT, SGPT, Amylase, Lipase, Carbonic anhydrase etc. Acidosis, Alkalosis

## **UNIT- 5**

### **Hyperglycemia & hypoglycemia -**

5.1 Diabetes mellitus - definition, types, features, gestation diabetes mellitus, glucose tolerance test, Glycosuria, Hypoglycemia & its causes

### **Reference Books**

1. A Text book of Medical Biochemistry- Chatterjee & Shinde.
2. A Text book of Biochemistry- C.B. Powar & Chatwal.
3. Principles of Biochemistry- Nelson & Cox.
4. Medical Laboratory Procedure Manual (T-M) by K.L. Mukherjee 1987, Vol. I, II & III Tata

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**CLINICALBIOCHEMISTRY**  
**MODEL QUESTION PAPER**

**Time : 3 hrs**

**Max. Marks : 75**

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**SECTION –I**

**Answer any FIVE of the following**

**5x5 = 25 Marks**

**(Draw labelled diagrams wherever necessary)**

1. Blood Glycolysis.
2. Glycolysis
3. Ammonia.
4. Ketosis.
5. Lipoproteins
6. L D H
7. Creatinine kinase.
8. Glycosuria.

**SECTION –II**

**Answer ALL the questions each question carries 10 marks**

**5x10=50 Marks**

**(Draw diagrams wherever necessary)**

9. (a) Describe about Glycogenesis. (or)  
(b) Write about Gluconeogenesis.
10. (a) Explain about Transformation. (or)  
(b) Describe the Urea Cycle.
11. (a) Write an essay on Essential fatty acids. (or)  
(b) Explain about Cholesterol and its clinical significance.
12. (a) Write about Diagnostic value of Serum enzymes. (or)  
(b) Describe the SGOT and SGPT.
13. (a) Write about Glucose tolerance test. (or)  
(b) Explain causes of hypoglycemia.

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**CLINICALBIOCHEMISTRY**  
**PRACTICAL SYLLABUS**

1. Oral Glucose Tolerance Test
2. Estimation of Blood Urea by DAMM Method
3. Estimation of Serum Creatinine by Jaffe's Method
4. Estimation of Serum Cholesterol & Total Lipid Profile.
5. Estimation of SGOT & SGPT.
6. Estimation of Triacylglycerol by both Enzymatic and Non-Enzymatic Methods
7. Determination of Electrolytes.
8. Determination of Serum Inorganic Phosphate.
9. Determination of Acid Phosphatase
10. Determination of Serum Inorganic Phosphorus
11. Estimation of Serum Calcium by OCPC Method
12. Estimation of Uric Acid by Uricase – Peroxidase Reaction Method
13. Estimation of Serum Proteins by Biuret Method

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**CLINICALHEMATOLOGY & CLINICAL MICROBIOLOGY**

**Course Outcomes:** By the completion of the course the graduate should able to –

**CO1:**Describe the collection and screening of body fluids

**CO2:**Explain the haematological analysis

**CO3:**Describe the structure and types of bacteria

**CO4:**Explain the commonly used equipment in microbiological laboratory

**CO5:**Describe the concepts of sterilisation, antiseptics, disinfections

**Learning objectives**

1. To understand the collection and screening of body fluids
2. To understand the haematological analysis
3. To understand the structure and types of bacteria.
4. To understand the commonly used equipment in microbiological laboratory.
5. To understand the concepts of sterilisation, antiseptics, disinfections

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**CLINICALHEMATOLOGY& CLINICAL MICROBIOLOGY**

**UNIT-1**

- 1.1 Body Fluids – Differential count of Peritoneal, Pericardial, Pleural Fluids and CSF, Charging Chamber, Identification and Counting the Cells.
- 1.2 Collection of Specimens:
- 1.3 Blood: Types of Specimens, Collection, Precautions during collection processing and preservation.

**UNIT-2**

- 1.1 Hematology & Blood Analysis: - Blood cell formation & Function, Normal Count of Blood Cells and their variations
- 1.2 Total Count of RBC, WBC, Platelet, and Reticulocytes. Hemoglobin estimation, Foetal Hemoglobin estimation.
- 1.3 Hemoglobin electrophoresis, Serum electrophoresis, Complete Hemogram.

**UNIT- 3**

**Cell structure, functions and structure of Bacteria:**

- 3.1 Definition, Structure and functions of the cell- Types of cells- Eukaryotic and Prokaryotic cells- Structure of Bacteria-
- 3.2 Types of Bacteria- Classification of Bacteria on the bases of shapes- Structure of Gram positive and Gram negative bacteria with special reference to the cell wall.

**UNIT-4**

**Common equipments used in Microbiology laboratory:**

- 4.1 Introduction to common equipments- Types of equipments used in Microbiology laboratory-
- 4.2 Principle and Uses of Incubator, Hot Air Oven, Water Bath, Anaerobic Jar, Centrifuge, Autoclave, Microscope
- 4.3 Safety Measures in handling microbiology equipments.

## **UNIT- 5**

### **Concept of Sterilization, Antiseptics & Disinfectants:**

5.1 Meaning and definition- Role of Sterilization- Classification and Uses of Sterilization

5.2 General Principles of Sterilization- Meaning, Definition,

5.3 Uses of Antiseptics and Disinfectants- Types and Mode of action.

### **Reference Books**

1. A Text book of Medical Physiology- Guyton andHall
2. A Text book of Medical Pathology-Robins
- 3.Text book of Medical Microbiology -Prescott.
- 4.A Text book of Microbiology-Ananthanarayanan.
5. An Introduction to Microbiology - Gerad J.Tortora



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**CLINICALHEMATOLOGY & CLINICAL MICROBIOLOGY**  
**MODEL QUESTION PAPER**

**Time : 3 hrs**

**Max. Marks : 75**

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**SECTION –I**

**Answer any FIVE of the following**

**5x5 = 25 Marks**

**(Draw labelled diagrams wherever necessary)**

1. CSF.
2. Pericardial.
3. RBC.
4. Bacteria.
5. Gram positive.
6. Water bath.
7. Antiseptics.
8. Uses of Sterilization.

**SECTION –II**

**Answer ALL the questions each question carries 10 marks**

**5x10=50 Marks**

**(Draw diagrams wherever necessary)**

9. (a) Explain about Peritoneal and Pleural fluids. (or)  
(b) Write about collection of Specimens.
10. (a) Describe the blood cell formation and function. (or)  
(b) Write about complete Hemogram.
11. (a) Define cell and write about structure & Function of cell. (or)  
(b) Write about types of bacteria.
12. (a) Describe the types of equipments used in micro biology Laboratory. (or)  
(b) Write about Autoclave and Hot air oven.
13. (a) Explain about types of Bacteria. (or)  
(b) Describe disinfectants mode of action.

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**CLINICALHEMATOLOGY & CLINICAL MICROBIOLOGY**  
**PRACTICALS SYLLABUS**

1. Drawing of Capillary Blood & VenousBlood.
2. Determination of Bleeding Time & ClottingTime.
3. Human Chorionic GonadotropinTest.
4. Identification of BloodGroups.
5. Study of Blood Smear for differentialCount.
6. Estimation ofHemoglobin.
7. Total count ofRBC.
8. Total Count ofWBC
9. Determination of PlateletCount.
10. Determination ofESR.
11. Detection of MalariaParasite.
12. Sickle CellTest
13. Identification, principle and Working ofinstruments
  - a. Incubator,
  - b. Hot AirOven,
  - c. WaterBath,
  - d. AnaerobicJar,
  - e. Centrifuge,
  - f. Autoclave,&
  - g. Microscope