

## SEMESTER IV

### **PAPER IV : BIOPHYSICAL AND BIOANALYTICAL TECHNIQUES – II**

#### **UNIT I**

##### **Basic principles of electromagnetic radiation**

Energy, wavelength, wave numbers and frequency

Absorption and emission spectra Beer - Lambert law light absorption transmittance. UV and visible spectrophotometry – principles, instrumentation and application in enzyme assays and kinetic assays, protein structural studies, nucleic acid structural studies

#### **UNIT II**

Spectrofluorimetry – principles, instrumentation and applications in vitamin assays (riboflavin and thiamine), enzyme assays, fluorescent probes in the study of protein and membrane structure.

Flame photometer – principles, instrumentation and applications in trace elements (sodium, potassium).

Atomic absorption spectrophotometry – principles, instrumentation and applications

#### **UNIT III**

##### **ELECTROPHORETIC TECHNIQUES:**

General principles. Factors affecting the migration rate

Tiselius moving boundary electrophoresis.

PAGE

SDS- PAGE

Immuno-electrophoresis

Cellulose acetate membrane electrophoresis.

Agarose gel electrophoresis

#### **UNIT IV**

Computer fundamentals, introduction to Computer, Classification of digital computer systems, anatomy of digital computers, Computer architecture, Number system, Memory units, Auxiliary storage devices, Input devices, Output devices, Operating Systems, Programming languages, Introduction to data base management systems, Fox Pro applications.

## **UNIT V**

Window 98 – features, Ms word, Word Basic, creating a document/template, mail merge, Tamil word processor.

Introduction to Excel – Data sort, data filters, valid criteria, invalid criteria, redundant criteria, functions.

Working with Power point – Parts of power point, windows – various toolbars, slide manipulation, fonts, graphs, tables and template.

Introduction to telecommunication – computer network, communication systems, distributor systems, internet and world wide web, electronic mail and intranets.

## **BOOKS RECOMMENDED**

1. Principles and techniques of practical Biochemistry

Keith Wilson & John Walker

Fourth Edition, (1995)

Cambridge University Press, London

2. Modern Experimental Biochemistry

Rodney Boyer

Third Edition, (2001)

Benjamin Cumnuns, New York.

## **MAJOR BIOCHEMISTRY PRACTICAL II**

### **1. OXIDOMETRY**

- a. Use of potassium permanganate in the estimation of Iron, Oxalates, and Hydrogen peroxide
- b. Estimation of calcium in biological fluids like blood, milk and urine
- c. Use of Potassium dichromate in the standardization of sodium thiosulphate and estimation of copper by iodometry.

### **2. COLORIMETRY**

- a. Estimation of inorganic Phosphate by Friske and Subbarow method
- b. Estimation of amino acids by Ninhydrin method
- c. Estimation of protein by Lowry's Method

### **3. BIOCHEMICAL PREPARATIONS**

- a. Preparation of starch from potato
- b. Preparation of casein and lactalbumin from milk
- c. Preparation of albumin from egg

### **4. EXPERIMENTS ON COLLOIDS AND GELS**

- a. Preparation of colloids and determination of Viscosity
- b. Preparation and protective action of colloids
- c. Preparation of gel (agar, gelatin or starch) and demonstration of diffusion

### **5. GROUP EXPERIMENTS**

- a. Preparation of Haemoglobin from blood
- b. Preparation of cellulose from plant material
- c. Preparation of Glycogen from animal source