

KRISHNA INSTITUTE OF MEDICAL SCIENCES DEEMED TO BE UNIVERSITY.

Krishna Institute of Medical Sciences, Karad

Programme Name : P.G. D.M.L.T CHOICE BASED CREDIT SYSTEM

Programme Code : 1303

Course Name: Biochemistry

Course Code – 11 To 13

Paper III Biochemistry Semester I

a) Theory

Credit : 2 Hours : 30

- Introduction
- Professional Ethics –Role of laboratory Technician in diagnosis
- Laboratory glassware - Different types. Uses and care in handling, cleaning and disposal. Calibration of volumetric apparatus.
- Basic principles of laboratory work, personal safety against various accidents and hazards, knowledge of first - Aid, care to handle dangerous materials.
- Specimen collection : whole blood ,plasma, serum, urine, C.S.F & other body fluids etc. Preservation of specimens, anticoagulants etc.
- Laboratory waste disposal & bio safety : General laboratory protection methods
- Principle of working of various instruments and their uses : Care & maintenance/repair/condemnation

Balances – mono pan, two pan
Incubators, Ovens, Water baths ,Sterilizers,
Magnetic stirrer, Vortex mixer
Deionizer/Distillation plants
Centrifuges- Table top ,high speed –room temp & cold. ultra centrifuge
- Basic principles of Biochemistry

Solvents & solutions –Normality, Molarity ,Molality, Preparation of standard solutions e.g. normal solution, molar solution, percent solution, Use of buffer, buffer preparation ,pH indicator & pH maintenance
- Other laboratory requirements –Chemical and general items. Specifications of all laboratory requirements and purchase procedures. Stock maintenance and inventory control.
- Chemistry & Metabolism of Carbohydrate

- Chemistry & Metabolism of protein
- Vitamins- Classifications, sources, functions ,deficiency Chemistry and functions of hemoglobins including porphyrin and bilirubin metabolism
- Functional Tests - LFT

Paper III Biochemistry

Semester I

b) Practical & Rotational Posting in Lab

Credit: 2 + 3 = 5

Hours: $60 + 90 = 150$

- Introduction
- Laboratory glassware - Different types. Uses and care in handling, cleaning and disposal. Calibration of volumetric apparatus.
- Basic principles of laboratory work, personal safety against various accidents and hazards, knowledge of first - Aid, care to handle dangerous materials.
- Solvents & solutions –Normality, Molarity, Molality, Preparation of standard solutions e.g. normal solution, molar solution, percent solution, Use of buffer, buffer preparation, pH indicator & pH maintenance
- Qualitative Tests for Proteins (Precipitation)
 - A) Heller's Test
 - B) Sulphosalysic Acid Test
 - C) Trichloro Acetic Acid Test
 - D) Heat coagulation Test
- Qualitative Tests for Proteins (Colour Reactions)
 - A) Biuret Test
 - B) Ninhydrin Tests
 - C) Sulphur Test ('S' containing amino acids)
- Normal urine analysis
- Abnormal urine analysis
- Demonstration of colorimeter, Spectrophotometer
- Estimation of Blood Sugar
- Estimation of Blood Urea
- Estimation of Serum Proteins & A:G ratio
- Estimation of Serum & Urine Creatinine
- Estimation of Serum Total Bilirubin, Direct Bilirubin, indirect Bilirubin
- Estimation of Serum Alkaline Phosphatase
- Estimation of Serum Amylase
- Estimation of Serum OT / PT
- Demonstration- Chromatography
- Reagent making

Paper III Biochemistry
Semester II

a) Theory Credit : 2 Hours : 30

- Chemistry & Metabolism of Lipid
 - Enzymes – Kinetics, Diagnostic & Therapeutic enzymes
 - Mineral Metabolism –Special reference to calcium ,phosphorus ,Iodine, Iron, (TIBC)
 - Analytical instruments and techniques: Principle, types, use, care and maintenance of photoelectric colorimeters, spectrophotometers, ISE, electrophoresis, chromatography, Elisa and RIA isotopes
 - Acid base balance, blood pH, electrolyte balance, acidosis , Alkalosis
 - Hormones
 - function and separation of plasma proteins.
 - Functional Tests - KFT,TFT, CFT
 - Other laboratory requirements – Chemical & reagents –solid & liquid,
 - Diagnostics kits for detection of metabolites, criteria for selection of kits & specifications ,purchasing & indenting procedure ,Inventory control and maintenance of stock ,
 - Periodic stock verifications & audit.
 - Organization and management in the laboratory, methods of labeling, collection of specimens. Maintenance of laboratory records – reports, indexing and cataloguing
 - Interpersonal relations and communication with doctors, nurse, ward boys, patients, relatives, colleague and superior etc.
- Methods of quality control, statistical concepts, (various charts) knowledge of reference values for various laboratory tests and their interpretations.
- Quality control: Role and importance of quality control. Accuracy, Reliability, Precision etc. Internal and external quality control measures, pre & para analytical errors, specificity & sensitivity, importance of accuracy & precision
- Automation in clinical laboratory – Semi auto analyzers, discrete auto analyzers, batch auto analyzers, ISE analyzer
 - Information systems – use of computer & networking in clinical labs

Paper III Biochemistry
Semester II

b) Practical & Rotational Posting in Lab Credit : 2 + 2= 4 Hours :60 + 60 =120

- Estimation of Serum Uric Acid
- Estimation of Serum Calcium
- Estimation of Serum Cholesterol
- Estimation of Serum LDH
- Demonstration- Electrophoresis
- Estimation of Serum Sodium & Potassium by ISE
- Estimation Acid phosphatase
- Estimation of Serum Triacylglycerol
- Estimation of Serum LDL ,HDL
- Estimation of Serum Iron & TIBC
- C.S.F.Analysis
- Estimation of Serum phosphorus
- CK-MB Cardiac Profile
- Thyroid profile
- Lipid Profile
- Standardization urea & glucose
- Standardization Creatinine & uric acid

