

IV - SEMESTER
Clinical Biochemistry-(Course No-4)
Credits -3

COURSE OBJECTIVES

1. To understand the basic concepts of laboratory techniques.
2. To understand the basic concepts of organ functions.
3. To gain knowledge about various investigations and their interpretations.

UNIT-I

Clinical Biochemistry Laboratory and Investigation of Homeostasis. The use of biochemical tests- Specimen collection and types, Automation and Computerization Water and electrolyte homeostasis - renin angiotensin – aldosterone system Pathological variations of water and electrolytes- diagnosis and Interpretations Self Study: Acid base balance and imbalance - Mechanism of regulations, Anion gap, Acidosis and Alkalosis.

UNIT-II

Abnormal Hemoglobin and Inherited Disorders 9hrs Inborn errors of Metabolism: Patterns of inheritance - alkaptonuria, phenyl ketonuria, albinism, glycogen storage diseases and inherited disorders associated with urea cycle. Abnormal hemoglobin and hemoglobinopathies- Sick cell anemia and thalassemias, porphyrias and porphyrinurias. Self-study: Plasma proteins in health and diseases

UNIT-III

Investigation of Renal and Gastric Functions. Renal functions tests: Preliminary investigations, tests based on GFR, RPF and tubular function. Diseases related to kidney - nephritis, nephrosis, uremia, renal failure, renal calculi, renal hypertension, renal tubular acidosis, diabetes insipidus.. Dialysis - hemodialysis and peritoneal dialysis. Gastric function tests: Examination of resting content, Fractional gastric analysis, stimulation tests, Tubeless gastric analysis. Malabsorption syndrome, acidity, ulcers - gastric, duodenal and peptic, colon cancer, pancreatitis, gastric and pancreatic 'function tests. Self study: Gout, Leschnyhan syndrome and oroticaciduria.

UNIT-IV

Liver Function Tests and Lipid Disorder Liver function tests: Tests based on abnormalities of bile pigment metabolism, detoxification and excretory functions. Diagnosis of different types of jaundice. Pancreatic function tests. Diseases relating to liver - jaundice, cirrhosis, hepatitis, cholestasis, cholelithiasis, hepatic coma, hepatic carcinoma, inherited diseases of bilirubin metabolism Lipid: Lipoproteinemias and atherosclerosis coronary heart diseases and hypertension. Self study: Biochemical changes in cancer - detection of tumor markers

UNIT- V

Blood Glucose Regulation and Enzymes of Diagnostic Importance 9 hrs Carbohydrates: Blood glucose level - regulation and its clinical significance, Diabetes mellitus, Glycosuria and GTT. Enzymes and Isoenzymes of clinical importance - general principles of assay - Clinical significance of enzymes and isoenzymes (LDH, CK, phosphatase, 5' nucleosidase,

amylase, lipase, acetyl cholinesterase, transaminase and gamma glutamyl transferase) Self study: meningitis, encephalities, epilepsy, Parkinson's, Alzheimer's, cerebral palsy.

IV - SEMESTER
Clinical Biochemistry-(Course No-4)
Credits -1

PRACTICAL SYLLABUS

1. Blood analysis:
Iron and Hemoglobin, Glucose, GTT. 10hrs
2. Serum and Urine analysis:
Creatine, chloride, phosphorus, calcium. 10 hrs
3. Lipid profiles (Serum) –
Total cholesterol, triglycerides, HDL, LDL 5 hrs
4. Liver function tests –
Total Bilirubin, total protein, albumin, globulin, albumin/globulin ratio, AST, ALT, ALP 10 hrs
5. Kidney function tests
Urea, creatinine, uric acid.

COURSE OUTCOMES

1. After completing this course, the student will:
2. Obtain basic knowledge about specimen collections, pathological variations of water, electrolytes
3. Interpret the results to diagnose the abnormal functions of organs.
4. Understand the antinutrient factors and its implication on other nutrients in food. Understand the, patterns of inherited disorders and disorders of hemoglobin metabolism
5. Correlate the tests used for renal and gastric functions and their interpretations
6. Impart the diagnostic tests for liver function and lipoprotein metabolic disorders
7. Evaluate the alterations in blood glucose regulation and enzymes of clinical importance

REFERENCE BOOKS

1. Gowenlock, A.H. and Donald, J(2002). Varley's practical clinical Biochemistry, sixth edition, CBS publications and Distributors, New Delhi.
2. Sembulingam, K and Sembulingam, P(2010). Essentials of Medical Physiology, fifth edition. Jaypae Brothers (p) ltd, New Delhi.
3. Burtis and Ashwood (2007) Tietz Fundamentals of Clinical chemistry, 6th edition, WB Saunders Company, Oxford Science Publications USA.
4. Chatterjee and Shindae(2012). Text book of medical biochemistry, 8th edition.

5. Devlin, T.M(2010). Text Book of Biochemistry with clinical correlations, 7th edition. NewYork.
6. Gans, G and Murphy, J.M. (2008). Clinical Biochemistry, fourth edition, Churchill Livingstone, Elsevier