ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM

VII SEMESTER **BIOTECHNOLOGY** TIME: 3 Hrs/ Week

BTH 7705 (3) **CLINICAL LABORATORY TECHNIQUES** Max. Marks: 100

(Skill Offered Course – SOC)

W.e.f 20AH Batch

OBJECTIVES: To enable the students to –

- Get the general clinical lab SOPs
- Attain the knowledge on sample collection, specimen preparation processing
- Learn the different serological profiles related to diabetes
- Acquire the skill on enzyme assays
- Accomplish the skill on liver biochemical tests

I. Learning outcomes:

1. Know fundamentals of general clinical laboratory procedures and sample collection.
2. Will perform sample /tissue collection, specimen preparation and processing procedures.
3. To understandbiochemical assays related to diabetes and glycemic profile.
4. To perform different enzyme assays and analyze their correlation to health and disease state.
5. To acquaint knowledge on liver functions tests, their correlation to liver metabolism.

UNIT-I: General Awareness/Safety precautions

1. Laboratory procedures and analytical methods in a clinical laboratory.
2. Blood,plasma,serum, urine collection and basic diagnostic tests.
3. Pre- and post-exposure guidelines for HIV.
4. Drug Resistant Tuberculosis, Hepatitis B & C.
5. Patient management for clinical samples collection, transportation and preservation,
6. Sample accountability, Purpose of accountability, Methods of accountability.

UNIT – II: Sample Preparation and analysis

1. Introduction, factors affecting sample analysis.
2. Reporting results, basic format of a test report.
3. Reported reference range, clinical alerts, abnormal results.
4. Results from referral laboratories, release of examination results, alteration in reports.
5. Tissues and body fluids- specimen preparation, processing and identification.

UNIT – III: Automation in clinical laboratory

1. Diagnosis of diabetes mellitus – glucose tolerance test, random fasting and post-prandial glucose levels.
2. Glycosuria, ketone bodies, glycosylated haemoglobin, plasma insulin.
3. Hypoglycaemia – fasting and provoked; diagnosis – stimulation tests (I.V. glucagon and leucine test); extended G.T.T.
4. Hypoglycaemia in children – neonatal and early infancy.
5. Investigation of glycogen storage diseases, galactosemia, hereditary fructosuria, lactose intolerance.

UNIT – IV: Clinical Enzymology

1. Plasma enzymes in diagnosis and prognosis.
2. Clinical application of plasma enzyme assays in myocardial infraction, kidney function tests and muscle disease.
3. Test for gastric function – fractional test meal. Pentagastrin test, insulin stimulation tests.
4. Malabsorption syndrome due to intestinal disease and pancreatic dysfunction, differential diagnosis.

UNIT V: Liver metabolism

1. Liver metabolic functions and tests (LFTs) related to protein, carbohydrate, lipid, pigment metabolism, detoxification and excretion.
2. Serum enzymes in liver disease.
3. Jaundice – classification and differential diagnosis.
4. Hydrogen ion homeostasis: Blood buffers, bicarbonate-buffering system.
5. Role of Kidney.Red cells, lungs, acidosis and alkalosis.

REFERENCES

1. Practical Biochemistry by T Plummer
2. Practical Biochemistry by J Jayaraman
3. Klemir and others: practical Biological chemistry.
4. Practical Biochemistry – Koch and Hank Dunn and Drell
5. Microbiology laboratory Manual 4th Edit. By Cappuccino
6. Microbiology laboratory Manual (2001) by Aneja, K.M
7. Laboratory Manual in Microbiology by P.Gunasekaran (1996), New Age Publications

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