FURTHER DETAILS REGARDING MAIN TOPICS OF PROGRAMME NO. 05/2013 (Item No. 15&16)

VOCATIONAL INSTRUCTOR IN MEDICAL LABORATORY TECHNICIAN COURSE

VOCATIONAL HIGHER SECONDARY EDUCATION.

(CATEGORY NO. 94/2011 & 96/2011)

1. Anatomy, Physiology & Biochemistry

Anatomy

Anatomical and histological aspects of skeletal system, muscular system, joints, Thorax, Respiratory system, Heart, Vascular System, Lymphatic System, Digestive System, Urinary System, Respiratory System, Nervous System, Endocrine System, Skin and Tissues.

Physiology

Blood-composition and functions, respiratory system, Digestive system, cardiovascular system, renal system, endocrinology, reproductive system, muscle and nerve, nervous system, skin and temperature regulation.

Biochemistry

Units of measurements, laboratory glasswares, cleaning of glasswares, laboratory safety, laboratory hazards, first aid, expressing concentrations of solutions, grades of chemicals, purification of water, buffer systems, balance, centrifuge, calibration of glasswares, primary and secondary standards, Collection and preservation of biological specimens, colorimetry, spectrophotometry, flourimetry, nephalometry, flame photometry, radioisotopes. Physical chemistry - osmosis, diffusion, dialysis, Donnan-membrane equilibrium, viscosity, colloids, emulsions.

Basic knowledge about the metabolism of carbohydrate, protein, lipids, nucleic acid, vitamins, minerals, haemoglobin, prophyrins, enzymes, acid-base balance, nutrition, hormones. Function tests - liver, kidney, gastro intestinal, pancreas, gonadal, feto-placental, thyroid function tests. Lipid profile , analysis of calculi, electrophoresis, chromatographic techniques.

CSF analysis ,urine qualitative and quantitative analysis, Bence Jones Protein urine metabolite -VMA & 5- HIAA and gastric juice analysis.

Quality control programme and automation in a clinical biochemistry laboratory.

Estimation of various parameters present in the blood (glucose, urea, cholesterol, uric acid, creatinine ,phosphorous, calcium, electrolytes, Bilirubin) samples and their normal values and interpretations, GCT, GTT, Glycosylated haemoglobin. Clinical enzymology - ALP, ACP, Amylase, AST, ALT, LDH, CK (activity determination, normal values, Interpretations etc).

2. Microbiology

General Microbiology

History of microbiology, laboratory safety. Microscopy - compound, dark ground, fluorescent and electron microscope. Sterilization and disinfection - different agents and technique used. Staining techniques - Gram's, Acid fast & other special staining techniques. Morphological classification of bacteria, culture media, composition & preparation of media, culture technique, biochemical tests used for identifying bacteria, a study of medically important bacteria, processing clinical specimen for diagnosing infections, serological tests for diagnosis of infections, antibiotic susceptibility tests.

Parasitology

Medically important protozoan and helminthic parasites and important protozoa, nematodes, cestodes and trematodes their morphology, life cycle and laboratory diagnosis. Different techniques used for the laboratory diagnosis of intestinal protozoan infections, Trichomoniasis, malaria, leishmaniasis, trypanosomiasis, filariasis , intestinal helminthic infections etc.

Mycology

A brief study of common medically important fungi & their infections. Common contaminant fungi. Morphological study - KOH preparation, Lacto phenol cotton blue, slide culture, culture media - composition and preparation of Sabouraud's dextrose agar.

Virology - Structure of viruses, DNA & RNA viruses, cultivation of viruses, common viral infections and laboratory diagnosis of infections.

Immunology - Antigen, Antibody , Antigen-Antibody reactions - agglutination, precipitation, ELISA,IF and common serological techniques for diagnosing microbial infections.

3. Pathology

Haematology - Composition of blood, development of blood cells. Normal and abnormal blood cell morphology, functions and identification. Haemoglobin - function, normal and abnormal haemoglobins and estimation. Anaemia, Leukemia, blood coagulation factors and mechanism of coagulation, disorders of coagulation, anticoagulants, collection of specimens, RBC, WBC, platelets and absolute eosinophil count, DC, ESR, PCV, osmotic fragility, Romanowsky stain ,supra vital staining , reticulocyte count, red cell indices (MCV, MCH, MCHC, CI). Bone marrow smear and staining. Peroxidase, PAS staining and Perl's staining and their significance. Blood parasites identification, LE cell preparation and identification. Blood coagulation studies and disorders of coagulation (BT, CT, PT, PTT & TT). Automatic blood cell counter.

Clinical Pathology - Urine - normal and abnormal constituents, physical, chemical and microscopic examination, stool examination for parasites, sputum examination, semen analysis, pregnancy test, CSF examination, examination of other body fluids.

Histotechnology - Introduction to histology. Reception of specimen, fixation, decalcification, processing of specimens (dehydration, clearing, infiltration and embedding). Microtomes and cutting of sections, staining and mounting (haemotoxylin & Eosin staining, PAS, Reticulin, VanGieson, Verhoeffs, Masson trichrome). Processing of frozen sections, Histokinet, Cryostat.

Blood banking - ABO and other blood group system Rh system. Antigen antibody reactions in immune haematology. Anticoagulants used in blood bank. Preparation of grouping sera. Grouping and Rh typing of blood, screening of donors, collection, preservation and storage of blood. Compatibility test in blood transfusion, serological tests on donor blood. Transfusion reactions, transmission of diseases by blood transfusion. Component separation.

Cytology - Important applications of cytology, collection of various specimens and preparation of smear, cell blocks, cytospin, cytological fixatives Papanicoloau's staining, Shorr's staining, identification of normal and abnormal smear, FNAC.

Cytogenetics - Buccal smear preparation, staining and Barr body identification. Karyotyping - chromosome identification, abnormal chromosomes and chromosome defects.

NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper.