SCREENING TEST

JUNIOR MEDICAL LABORATORY TECHNOLOGIST

Mode of Selection - Topper of Screening Test of Multiple Choice Questions (MCQs) Type Exam will be considered for offer letter for the post.
Number of Questions – Total number of questions in the Screening Test will be 100.
Duration of Test – 90 minutes
Language of screening test - English
Proposed Scheme of Number of Questions Paper and Syllabus –

S. No.	Subject & Syllabus	Number of questions
1.	Syllabus	80
2.	General Knowledge & Current Affairs	10
3.	Computer (Annexure II)	10
	Total	**100**

SYLLABUS

PATHOLOGY

Clinical Pathology
Reception of patients, noting carefully the test advised, phlebotomy and aftercare of patients.
The Microscope – different types, parts of microscope, cleaning & care.
Examination of Urine – Formation of urine Physical examination – Colour, transparency, pH and Sp gravity. Chemical examination - Protein, Sugar, Ketone bodies, Bile pigment/salt, Chyle, Blood. Microscopical examination – Cells (RBC, WBC, Epith), casts, crystals, Detection of microalbumin & 24 hours urine protein estimation.
Examinations of body fluids – CSF, Pleural, peritoneal & pericardial fluid, Bronchoalveolar lavage fluid, hydatid cyst fluid, Joint fluid.
Examination of Semen – physical characters, count, motility, viability and morphology
Transportation of different clinical materials to distant laboratories.
Basic concepts of Jaundice.

Haematology
Composition of blood and its function.
Origin, development & morphology of blood cells.
Common anticoagulants used-composition, amount, mechanism of action and methods of preparation of different types of vials.
Methods of estimation of Haemoglobin.
Methods of total counts of WBC, RBC & Platelets & fluids used.
Methods of determination of PCV.
Calculation of different red cell indices (Haemogram)
Basic principles of semi or automated blood cell counters & HPLC.
Drawing of peripheral blood smear, staining & stain preparation.
Bone marrow aspiration methods and staining & preparation of Tray for Bone marrow aspiration and biopsy.
Differential leucocyte count (peripheral smear study)
Reticulocyte staining, count and preparation of stain.
Erythrocyte sedimentation rate (Procedure & reading only).
Basic tests for coagulopathy – BT, CT, P time, APTT.
Some special test – LE cell test, RBC Osmotic fragility & Foetal Hb%.
Basics of quality control methods and Laboratory accreditation.

Biosafety measures and disposal of laboratory waste.
Cylochemical Stain for diagnosis/differential diagnosis of leukemia.
Basic concepts of anaemia, Leukemia and hemorrhagic disorder

Histopathology & Cytopathology
Basic concepts of different mammalian tissues and their histological structure.
Different human organs and their gross and histological structure and functions.
Receiving of biopsy specimens at laboratory (Clinical notes/fixatives).
Fixation of tissue-different fixatives and their mode of action.
Methods of decalcification.
Processing of tissues-protocol for manual & automated tissue processors, paraffin embedding & preparation of blocks, preparation of reagents, different techniques & application and frozen section/cryostat.
Use of Microtomes, selection and maintenance of knives, technique of section cutting & mounting on slides.
Staining of tissue sections, preparation of different stains, staining methods for Haematoxylin & Eosin, Reticulin, PAS, Van-Gieson, Massion's trichrome, Lipid & Mucin stains & Perl's stain.
Preservation of specimens and mounting of museum specimens.
Preparation of cytosmear and H&E, Papanicolaou & MGG staining of different body fluids.
Fine Needle Aspiration cytology & exfoliative cytology & Buccal Smear examination.
Cytochemistry & immunohistochemistry. 13 Cytospin and cell block preparation.

Blood Banking
Blood Group (ABO & Rh) – methods of grouping & reverse grouping.
Basic blood banking procedures – collection of blood, anticoagulants used, cross matching, different screening tests including Coomb's Test for incomplete antibodies, preparation of different blood components for use and how to serve a requisition. Preparation of red cell suspension.
Blood transfusion & hazards. 04 Detect the time when to discard blood in Blood Bank 05 Computerized record keeping of Blood Bank

MICROBIOLOGY

General Bacteriology
Physiology and growth requirements.
 Sterilisation – principles & different methods adopted.
Preparation of culture media
Bacterial staining – Gram/Ziehl Neelsen/others
Methods of colony count & morphological identification of bacteria by colony characters, staining & motility tests.
Biochemical tests and interpretation.
Final identification of bacteria with High-titre sera
Antibiotic sensitivity tests.

Systemic Bacteriology
The microbial world and the structure of microbes.
Collection of specimens for microbiological examination.
Methods of inoculation of culture media from different samples.
Basic concept of individual Bacteria.
Laboratory diagnosis of pyogenic infection.
Laboratory diagnosis of Leprosy.
Laboratory diagnosis of Tuberculosis.
Laboratory diagnosis of URTI.
Laboratory diagnosis of LRTI
Laboratory diagnosis of Enteric fever.

Laboratory diagnosis of Bacillary dysentery.
Laboratory diagnosis of Diarrhoeal diseases.
Laboratory diagnosis of Urinary tract infection
Laboratory diagnosis of Meningitis.

Immunology & Serology
Antigens & Antibodies – definition, types, preparation & preservation.
Types of Antigen and Antibody reactions.
Diagnostic serological methods – Agglutination & Flocculation, Latex agglutination tests – to be performed by the students, Elisa testing & RIA – principles and demonstration and interpretation of results of - Widal Test, VDRL Test, Aldehyde Test, ASO Titre, Rheumatoid factor, C-reactive protein, HBsAg, Anti HCV, Anti HIV.

Clinical Bacteriology
Laboratory diagnosis of UTI, Sore throat, diarrhoea, acute pyogenic meningitis, Food poisoning and others
Parasitology
Basic knowledge on Protozoa and helminths.
Mycology
General & Systemic Mycology
Animal Care
Common laboratory animals – Food, Handling, Housing, Breeding.
Care of normal and experimental animals.
Sacrifice, postmortem and disposal.
Clinical Microbiology
Laboratory diagnosis of Malaria, Protozoal dysentery, Kalazar, Hook worm infection, Ascariasis, Filariasis, Taeniasis, hepatitis, Viral diarrhea, HIV/AIDS, Candidiasis, Cryptococcal meningitis.
Biosafety measures.
Examination of stool
Quality Control
Virology
General & Systemic Virology

BIOCHEMISTRY

Laboratory hazards, Laboratory safety procedures, Laboratory waste disposal.
Collection, Separation, preservation and transport of the biological specimens, anticoagulants.
Clinical laboratory instrumentation (Balance, Oven, Water bath)
Concept of solute, solvent & colloidal solution, Normal solution, Molar solution, molal solution, osmol, osmolar solution, standard solution (Primary & Secondary) ionic strength of solution.
Acid, Base, Buffer (Definition, example, pK, pH, Handerson-Hasselbach's equation)
Principles of Photometry, (Lambert-Beer's Law, Flamephotometry, Reflectance Fluorometry.)
Ion selective electrodes. (Nernst equation, pH electrode, Sodium, Potassium electrode, PCO2 electrode)
Chemistry of Carbohydrates.
Chemistry of Lipids.
Chemistry of Amino Acids and Proteins.
Chemistry of Nucleic acids & nucleotides.
Radioactivity (Types) of radioactive decay with examples, Radioactive half life, Units of radioactivity application of radioisotope in clinical chemistry)
Electrophoresis. (Principle, types, application in clinical biochemistry, Serum & Hemoglobin electrophoresis)
Detection of Drugs & Toxic substances. (Principles of Chromatography, paper & thin layer Chromatography, their application in detection of drugs & toxic substances)

Definition of Antigen & Antibody, Antigen-Antibody reaction, Detection of Antigen-Antibody Reactions (ELISA, RIA)

Clinical Enzymology. (Definition of enzyme, classification with examples, types of enzyme-substrate reactions, assay of enzymes. End point & Kinetic, clinical importance of enzymes, isoengymes.)

Disorders of Carbohydrate metabolism & their detection. (Method of measurement of glucose in plasma & urine, ADA classification of Diabetes Mellitus, Glucose Tolerance Test, Detection of gestational diabetes, Glycosylated hemoglobin, self monitoring of blood glucose).

Nutritional disorders & their detection.

Liver Function Tests. (Over view of anatomy & physiology of Liver, bilirubin metabolism, jaundice & its biochemical diagnosis).

Renal Function Tests. (Overview of anatomy & physiology of Kidney, Clearance Tests, other biochemical tests for detection of the renal function i.e. Serum creatinine, urea, sodium, potassium, urinary micro albumin and 24 hours protein estimation in urine, urinary osmolarity).

Disorders of Cardiovascular system & their laboratory detection. (Disorders of Cholestrol metabolism measurement of plasma lipoproteins, Cardiac enzymes.)

Thyroid Function Tests.

Pancreatic & Gastrointestinal Function Tests. (Faecal fat, Hyperamylasemia, D-Xylose absorption Test)

Disorders of joints & their detection.

Basic concept of laboratory automation. (Configuration of clinical laboratory analyzers).

Basic concept of laboratory statistics. (Reference value, mean, median, mode, standard deviation, coefficient of variation.)

Basic concept of quality control in clinical biochemistry laboratory. (Control material, Leavy Jennings Plot.)

COMPUTER

Knowing Computer: What is computer; Basic applications of computer; Components of computer system; Central processing unit (CPU); VDU; Keyboard and mouse, other input/output devices; Computer memory; Concepts of hardware and software; Concept of computing, data and information; Applications of IECT; Connecting keyboard, mouse, monitor and printer to CPU and checking power supply.

Operating Computer Using GUI Based Operating System: What is an operating system; Basics of popular operating systems; The User Interface; Using mouse; Using right button of the mouse and moving icons on the screen; Use of common icons; Status bar; Using menu and menu selection; Running an application; Viewing of file, folders and directories; Creating and renaming of files and folders; Opening and closing of different windows; Using help; Creating short cuts; Basics of O.S. setup; Common utilities;

Understanding Word Processing and M. S. Office: Word processing basics; Opening and closing of documents; Text creation and manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Printing of word document; Understanding of components of M.S. Office; M.S. word; M.S. excel sheets; M.S. power point etc;

Using Spread Sheet: Basics of spreadsheet; Manipulation of cells; Formulas and Functions; Editing of spread sheet; Printing of spread sheet;

Introduction to Internet, WWW And Web Browsers: Basics of computer networks; LAN; WAN; Concept of internet; Applications of internet; Connecting to internet; What is ISP; Knowing the internet; Basics of internet connectivity related troubleshooting; World Wide Web; Web browsing softwares; Search engines; Understanding URL; Domain name; IP address; Using e-governance website;

Communications and Collaboration: Basics of electronic mail; Getting an email account; Sending and receiving emails; Accessing sent emails; Using emails; Document collaboration; Instant messaging; Netiquettes;

Making Presentation: Basics of presentation software; Creating presentation; Preparation and presentation of slides; Slide show; Taking printouts of presentation/handouts

General knowledge & Current Affairs