Office of the I/C Controller of Examination

Government Medical College Baramulla

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Subject: Syllabus for written examination for the post of Technical Assistant/Technician (laboratory Technician).

Notice

Government Medical College Baramulla has advertised the post of **Technical Assistant /Technician (laboratory Technician)** vide Advertisement No. 12 of 2023 Dated: 30-11-2023. Accordingly, the syllabus for the post of **Technical Assistant /Technician (laboratory Technician)** advertised vide aforementioned advertisement notice is hereby notified as **Annexure "A" .**

I/C Controller Examinations
Govt. Medical College Baramulla.

No.: GMC/BLA/Exam/2023/376-80 **Dated: 01-12-2023**

Copy to:

1. Administrative Secretary, H&ME, UT of J&K.
2. Principal Govt. Medical College Baramulla for the favour of information.
3. Administrative Officer Govt. Medical College Baramulla for information.
4. I/C Website, Government Medical College Baramulla.
5. Office Copy.

Annexure 'A'

Syllabus for Technical Assistant/Technician (Laboratory Technician)

Marks 100
Time 100 Minutes

ANATOMY AND PHYSIOLOGY

- Introduction to human body, its anatomy and physiology
- Cell structure and function
- Lymphatic system
- Skin structure and function
- Sensory organs
- Excretory System
- Circulatory system
- Endocrine system
- Digestive system
- Reproductive system
- Connective tissues

CLINICAL MICROBIOLOGY

- Introduction to Microbiology
- Morphology of bacteria
- Bacterial cell wall , spores, flagella and capsules
- Bacterial growth and nutrition of bacteria
- Classification of bacteria
- Microscopy:- Principle, Types and their uses
- Sterilization:-Physical, chemical and sterilization control
- Bio Safety cabinet, safety rules (universal precautions) in a microbiology laboratory

- Bacterial culture, Culture techniques and Various Culture Medias
- Staining techniques: - Routine as well as Special techniques
- Identification of Bacteria:- Step care Approach
- Antibiotic sensitivity Methods ,Principle and clinical importance
- Role of clinical Microbiology in the Diagnostic Field
- Merits and Demerits of Cultural techniques over Non cultural Diagnostic Techniques
- Definition of pathogenicity, pathogenesis and virulence
- Sources and Types of infection
- Systemic Bacteriology
- Nosocomial Infection:- source and Control of nosocomial infections
- Laboratory diagnosis of :- U.T.I(Urinary Tract Infection), R.T.I (Respiratory Tract Infection),Enteric Fever
- Mycobacterium Tuberculosis
  Various automatic techniques for identification of MTB
- Collection and transportation of various clinical samples, for Culture – Urine, Stool, Sputum, Throat swabs, Pus and Pus swabs, Blood, Skin, Eye and Ear swabs and CSF.

- Significant Bacteriuria
- General characteristics, morphology,classification, Life Cycle and Lab.Diagnosis of:
- Protozoa and Helminthes
- Principle and application of concentration techniques of stool for demonstration of ova and cysts
- General Characteristics, Classification and Structure of viruses.
- Viral Transport Media (VTM) its use
- Lab diagnosis of :
- Hepatitis A, B & C.
- H.I.V
- H.S.V(Herpes Simplex Virus)
- Cultivation of viruses including cell line culture ,egg inoculation culture
- Tzanck smear
- Sellers stain
- Characteristics and classification of medically important fungi
- Fungal Culture media :
- SDA (Sabouraud's dextrose agar) with Various Modifications
- CMA (Corn meal agar)
- BHI (Brain Heart Infusion)
- BSA(Bird Seed Agar)

- Collection and procuring of sample for fungal infection in Skin, Nail and Hair

- KOH preparation,LCB (Lactophenol cotton blue),India ink
- Fungal Culture and identification of
- Yeast, Dermatophytes, Penicillium, Rhizopus, Mucor, Aspergillus
- Laboratory Diagnosis of Cryptococcosis
- Laboratory Contaminants
- Introduction to Immunology
- Immune and complement system
- Cells involved in immune system
- Organs involved in immune system
- Auto immune Antibodies
- Immunization /Vaccination ,types of immunity and vaccination
- Antigen, Antibody and complement
- Antigen- Antibody Reactions
- Various Serological Tests:- Agglutination, Precipitation and Flocculation reactions
- Complement Fixation :- ELISA with various modifications
- Molecular Technology
  PCR with various Modifications
  LCR (Ligase chain reaction)

HEMATOLOGY

- Haemopoeisis :- Erythropoiesis, Leucopoeisis, Thrombopoeisis
- Collection and preservation of blood :- venous and capillary
- Romanowsky stains: Theory and preparation
- Haemoglobin :- Synthesis of haemoglobin, function and its degradation, Types of haemoglobin
- White cell count:- Total Leucocyte Count ,Morphology of White cells
- Various counting chambers
- Quality Assurance in haematology
- Automation in haematology
- Erythrocyte sedimentation rate (ESR) and packed cell volume (PCV)
- Red Cell Indicies – MCV, MCH, MCHC
- Supravital stain and reticulocyte counting
- Reticulocytes
- Anemias :- Definition and classification
- Laboratory diagnosis of: Iron deficiency anaemia , Megaloblastic anaemia , Haemolytic anaemia , sickle cell anaemia and Aplastic anaemia.
- Red cell fragility
- Haemostasis:- Theories of blood coagulation, Platelets and their role in haemostasis

- Bone marrow:- Composition and function of bone-marrow,Aspiration of bone-marrow and clinical Significance of bone-marrow examination.
- Leukemia:- Classification (FAB),Laboratory diagnosis of various leukemias.
- LE Cell phenomenon
- Semen Analysis
- Cell counts of various biological fluids

CLINICAL BIOCHEMISTRY

- Introduction to clinical biochemistry:- Importance of clinical biochemistry, SI Units and their use,
- Instruments:-Balance(Analytical, electrical/electronic), Centrifuge, Colorimeter, Spectrophotometer
- Ion selective electrodes,Glucometer,Distillation Plant/Deionizer apparatus and Volumetric apparatus and their calibration
- Blood fractions :- Serum, Plasma, protein precipitating reagents and Preparation of protein free filtrate (PFF)
- Collection and preservation of various clinical specimens for bio chemical analysis
- Acid Base Balance
- Carbohydrate Metabolism :Glycolysis,Glycogenlysis,Glyconeogenlysis,Glycogensis and Glyconeogensis
- Renal Function , Liver Function
- Metabolism of protein
- Electrolytes and trace elements
- Quality Assurance in Biochemistry as per National Standards

- Enzymes
- Lipid Profile
- Blood Gases
- Urine Analysis :-Normal composition of urine Clinical importance of urine analysis, Qualitative analysis of proteins, sugar, bile salts, bile pigments, urobilinogen and blood.
- Glycosuria, albuminuria and Ketoneuria.
- Detection of Occult blood , Excess fat in stool and their clinical significance
- Biological fluids analysis :-peritoneal, pleural synovial & Cereberospinal Fluid
- Electrophoresis
- Chromatography
- Automation in Clinical Biochemistry
- Thyroid function Analysis
- Introduction to Tumor markers :-Commonly used Tumor Markers (C.A. Markers)

HISTOPATHOLOGY AND CYTOLOGY

- Preparation of Tissues: Unfixed and Fixed Tissue preparations
- Reception of Specimen:-Reception, recording, labeling and preservation of histological specimen
- Fixatives:- Composition, types and Classification of various fixatives
- Properties of various fixatives their Merits and demerits
- Tissue Processing : including Reception,Labelling ,Fixation,Grossing ,section cutting and Staining.
- Automation in Histopathology
- Microtomy
- Theory of staining (Routine):-Principle and mechanism of routine stain (Haematoxylin and Eosin)
- Mountants :-Various types of mounting media (aqueous, resinous)
- Special stains :-Principle, significance and interpretation of different types of stains
- PAS (Periodic Acid Schiff's Reagent) ,Silver impergnation stain – Reticulin fibre ,Ziehl Neelson's – for AFB and Leprae ,Masson's trichrome stain ,Oil Red O – fat ,Gram's stain – Gram +ve and Gram –ve
- Decalcification:-Process of decalcification,Various types of decalcifying agents,Their mechanism and applications
- Handling of fresh histological tissues (Frozen Section):-Reception and processing of frozen tissue ,Frozen section cutting,Staining ,Mounting of frozen section
- Museum Techniques:- Introduction to museum with emphasis on importance of museum , Reception, fixation and processing of various museum specimens, Cataloguing of museum specimen
- Cell:-Definition and function,Structure,Multiplication (Mitosis and Meiosis)
- Exfoliative Cytology

- Aspiration Cytology
- Cytological Staining:-Principle, Technique and interpretation of results
- Papanicalaou staining,May Grunwald & Giemsa staining,Haematoxylin and Eosin staining
- Cytological Fixatives
- Autopsy:-Introduction to autopsy technique (Care and maintenance of autopsy area, autopsy instruments, handling of dead bodies),Use of autopsy
- Malignant Cells:- Characteristics,Differences from normal cell
- Advancements in Cytology:- Automation in Cytology, Use of Cytospin

TRANSFUSION MEDICINE

- Historical introduction to Transfusion medicine (blood banking)
- Various blood group systems
- ABO Blood Group System:-Antigens and antibodies involved
- Various blood sub groups (A_1,A_2, A_1B, A_2B)
- The Rh Blood Group System:- Antigen and antibody involved
- Anticoagulants used in blood bank:-Types and composition of various anticoagulants
- Criteria for selection of Donor
- Blood Collection and storage
- Screening of blood donor and characteristics of ideal blood donor, Blood collection procedure , Transportation and storage
- Cross Matching :- Types of cross matching, Various methods and their procedures
- Coombs Test :- Direct coombs test and Indirect coombs test
- Various blood components (Packed cells, Fresh frozen plasma, Cryoprecipitate, PRP(Platelet rich plasma)
- Preparation, Preservation and Uses
- Blood Transfusion reactions

MEDICAL LABORATORY MANAGEMENT

- Introduction, Layout, Facility of clinical Laboratory :-Role of medical laboratory technology in total health care, principles of management, techniques of planning, physical facilities/equipment – layouts and design

- Quality Assurance :-Analytical control, Internal and external quality assurance in clinical laboratories, precision,accuracy, standard deviation as per national standards

- Safety Precautions:-Safety measures in clinical laboratories (microbiology, haematology, biochemistry, histopathology and cytology, transfusion medicine),

- Disposal of Biomedical waste.
- First Aid in Clinical Laboratory:-Acid burn/Alkali burn,Accidental trauma,Gas/Toxic inhalation,Spillage
- Medical Ethics and Code of Conduct:-Ethics and code of conduct - legal aspects – confidentiality malpractice/ negligence; legal implications, law suits, consumer protection and insurance for professional health hazards
- Role of Computers in Laboratory
- Laboratory Accreditation – Introduction