

SCHEME AND SYLLABUS OF EXAMINATION FOR THE PURPOSE OF FILLING UP THE POST OF LABORATORY TECHNICIANS UNDER THE SIKKIM STATE SUBORDINATE ALLIED AND HEALTHCARE SERVICE.

I. The mode of examination and setting-up of question-papers shall be both, i.e., conventional type and objectives type MCQs in paper I and II. The candidates are required to answer the objective type MCQs in the OMR Sheets and are required to follow the guidelines provided in the OMR Sheet while answering the questions.

II. The subject wise allotment of maximum marks shall be as under:

Syllabus:-		
General English	PAPER I	50 marks
General Knowledge		30 marks
Main Paper Laboratory Techniciancourse	PAPER II	100 marks
TOTAL		180 marks
Viva voce/ interview		20 marks
Grand Total		200 marks

III. Syllabus for written examination for Laboratory Technicians :-

Sl. No.	Course	
01	02	03
01	ANATOMY	1. Introduction to the subject - Anatomical position, common planes & Anatomical terms. -Different branches of Anatomy. 2. Histology -Typical animal cell (Structure & Function) - primary tissues (Classification & function) 3. Skeletal System - Axial and appendicular bones -Joints &movements 4. Skin, Fascia and Muscles & Tendons 5. Circulatory System -Heart, Blood Vessels, Lymphatic &R.E.System -Spleen, Thymus & Tonsils 6. Respiratory System- Nose, Pharynx, Larynx, Trachea, Bronchi Lungs and Pleura 7. Digestive System- Alimentary canal (different parts)-Liver, Gall Bladder, Pancreases Peritoneum 8. Urogenital System- Different parts of urinary system -Different parts of Male & Female genital -System (Internal & External Genitalia) 9. Special Senses& General Sensibilities- Eye & Vision-Ears, Hearing & Equilibrium, -Taste & factory sensations, General Sensibilities like touch, pain, temperature. 10. Central & Peripheral nervous system- Brain & Spinal Cord.- Cranial & Spinal Nervous.- Autonomic Nervous System. 11. Regional Anatomy (Only Demonstration)-Extremities, Head & Neck, Thorax,Abd. & Pelvis, Surface Anatomy, Important Blood Vessels, Important Nerve, Important Muscles for Injection.
02	PHYSIOLOGY	1- Blood- Composition and general function of blood.Description of blood cells - normal counts & function.Steps of congratulation, Anticoagulants.Cerebrospinal Fluid, Formation, Composition & Function. Importance of blood groups composition & function of lymph. 2- Reparatory System -Name of structures involved in respirations and their function. External and internal respiration. How inspiration, expiration are brought about Transport of O <sub>2</sub> and CO <sub>2</sub> in the blood. Definition

		<p>of respiratory rate, Tidal volume, vital capacity, Hypoxia.</p> <p>3- <b>Excretory System</b>-Functions of Kidney, Nephron - Functions of Glomerulus and tubules, compositions of Urine, normal&amp; abnormal. Skin- Function of Skin.</p> <p>4- <b>Digestive System</b>-Composition and functions of saliva, mastication and deglutition. Functions of stomach, composition of gastric juice. Pancreatic Juice, Bile and Digestion of food by different Enzymes, Absorption and Defecation.</p> <p>5- <b>Endocrine-glands</b>-Definition of endocrine gland, Names of the endocrine gland and the hormone secreted by them.Major actions of such Hormones.</p> <p>6- <b>Reproductive System</b>-Name of primary and accessory organs in male and female. Name of secondary sexual characters in male and female. Function of ovary-formation of ova, actions of ovarian hormone, menstrual cycle.Functions of Testes-Spermatogenesis and secretions of testosterone. Fertilization Vasectomy and tubectomy.</p>
03	PHARMACOLOGY	<p>1. <b>General Pharmacology</b> Drug, Drug nomenclature, Route of administration, concept of Pharmacokinetics, Pharmaco-dynamics and Adverse during action.</p> <p>2. <b>Drugs for the diseases of fundamental System</b> GI System.Respiratory System.Cardiovascular System.Blood, Blood Coagulation, Thrombosis, different types of anti-coagula (Special emphasis).Drugs affecting the Urine and renal functions, excretion of drugs in stool, bile and other body fluids (Special emphasis).</p> <p>3. <b>Drugs for diseases of integrating systems of body</b> Central Nervous System.Autonomic System.Endocrine System and autacoids.</p> <p>4. <b>Chemotherapeutic Agents</b> Anti-Viral including AIDs, Hepatitis.Anti-Bacterial Drugs.Anti-Fungal Drugs. Anti-Protozoan Drugs.Anthelmintics.Anti-Cancer Drugs.</p> <p>5. <b>Antiseptic, disinfectants.</b></p> <p>6. <b>Drugs interfering in different Pathological tests.</b></p> <p>7. <b>Measurement of Drug levels in different body fluids and significance.</b></p>
04	COMMUNITY MEDICINE (SPM)	<p><b>Part A</b></p> <p>1. Identification and Public Health Importance of arthropods (Entomology): Mosquitoes, Lice, Fleas, Flies, Rats &amp; Rodents.</p> <p>2. <b>Water Sources:</b> Types, Purification Bio-Medical Waste Management Sanitation in Public Health</p> <p>3. <b>Food and Nutrition:</b> Collection of different food samples :Cereals, Pulses, Vegetables, Roots and tubers, Fats and oils, Animal foods including milk Food-borne diseases of Public Health importance, Assessment of Nutritional status.</p> <p><b>Part B</b></p> <p><b>STATISTICS-GENERAL</b> TABULATIONS : Simple Tables, Frequency Distribution Tables DIAGRAMS : Bar Diagrams, Histogram, Line Diagram Pie Diagram STATISTICAL AVERAGES : Mean, Median, Mode MEASURES OF DISPESION : Normal Curve, Range,</p>



		Standard Deviation Standard Error. TESTS OF SIGNIFICANCE : 't' Test.
		Part C COMPUTER 1. Computer Basics: Importance, History, Computer Generation, Types of Computer, Anatomy of Computer, Input-output Devices, Processing Units and outline of Data Processing, Computer memory, external storage devices, Hardware, Software Basic functioning of Computers. 2. Computer and Communication, Networking, Internet 3. Use of computer in Radio-diagnosis/Pathology Laboratory
05	PATHOLOGY	IMMUNO HAEMATOLOGY & BLOOD BANKING THEORY.
		THEORY. Introduction, Human blood group antigens, ABO blood group system and incompatibility, Rh blood group system and incompatibility , Technique of grouping and cross matching , Commb's test, Direct, Indirect , Blood Transfusion Procedure, Complication of blood transfusion, Blood Collection, Selection and Screening of donors., Collection of blood, Storage of blood, Cell separator and transfusion of various components of blood like Plasma and Platelet Separation , Organization, Operation and Administration of Blood Bank and anticoagulants.
		CLINICAL PATHOLOGY & HAEMATOLOGY Urine analysis, Physical, chemical, microscopic., Routine tests viz. Sugar, Albumin and Phosphates., Other tests viz. Bile salt, Bile pigment, Urobilin Ketone bodies, Chyle, Specific gravity, Total protein (Esbachs) etc., Faecal analysis for occult blood examination., Preparation of Scminal Fluid for analysis. , Preparation of aspiration fluids. , Ascitic fluid, Pleural fluid ,CSF , Others, Introduction to haematology. , Collection of blood sample and anticoagulants., Red Cell Counts, Haemocytometer and procedure for R.B.C. Count., RBC diluting Fluid , Calculation , Write Cell Count, Procedure for W.B.C count , WBC diluting fluid , Calculation , Differential white cell count. , Morphology of write cell, Normal values, Romanosky Stains , Counting methods , Absolute Eosinophil Count Direct/Indirect smear examination., ESR, Westergren's, Wintrobe's, Factors affecting ESR, Importance and Limitation , Normal value and interpretation. , Packed Cell Volume (Haematocrit), Macro and Micro method ,Interpretation., Haemoglobin estimation , Colorimetric method ,Sahali's method, Cyanmethaemoglobin method. ,Interpretation of result , Red Cell Indices, Calculation and importance of Reticulocyte count., Method-Interpretation ,Sickle Cell Preparation , Osmotic fragility test- Interpretation ,Estimation of G-6-PD, Principle of Electrophoresis. , Preparation of bone marrow aspiration and trephine biopsy.,Coagulation test: , Bleeding time , Whole blood coagulation time , Clot retraction test , Prothrombin time , Platelet count, Comments on peripheral smear., LE Cell Phenomenon.
		HISTOTECHNOLOGY, CYTOLOGY, MUSEUM STUDY Introduction, Cell, Tissue and their function.,Methods of examination of tissues and cells, Fixation of tissue: Classification of fixatives., Simple Fixatives and their properties. , Tissue processing : , Collection of specimen, Labeling and fixation , Dehydration , Clearing , Impregnation , Embedding, Paraffin blockmaking , Section Cutting: , Microtomes and microtome knives - sharpening of knife, Microtome use - Honing, Stropping, Techniques of section cutting , Mounting of sections., Frozen section. (a) Staining :, Dyes and their properties , Theory of staining ,



		<p>Staining technique with haematoxylin and eosin. , Mounting of actions , Common special stains – , Routine H &amp; E, MeasonTrichrome , Men – Geison , Reticulin , PAS, Fe, Lipid, Mucicamine , Vencos for calcium , Special staining , Decalcification : , Fixation , Decalcification , Detection of end point, Neutralization and processing.</p> <p>(a) Exfoliative Cytology and Fine needle aspiration cytology : , Types of specimens and preservation. , Preparation and fixation of smears. , Papanicolaous staining technique/MCC staining/HE staining/. , Sex chromatin staining. , Nuscum Techniques. , Reception of specimen., Preparation of fixation, Preservation , Presentation</p>
		<p><b>AUTOPSY TECHNIQUE:</b>Assisting in autopsy, Preservation of organs and ,Processing of the tissue.</p> <p>1. Waste disposal and safety in laboratory.</p>
06	MICROBIOLOGY	<p><b>GENERAL BACTERIOLOGY</b></p> <p>□ History of Microbiology, Microbes and their classification , Study of different , microscopes, Morphology of bacteria, Motional requirements of bacteria, Preparation and uses of culture media, Culture methods and identification of bacteria</p> <p><b>Sterilization and Disinfection</b></p> <p>□ Physical Chemical, Mechanical methods, Sterilization of media, syringe, glassware's etc., Safe disposal of contaminated media etc.</p> <p><b>Common Laboratory equipments and uses</b></p> <p>□ Different microscope, incubator, BOD incubator, Refrigerator, Deep Freeze,</p> <p>□ Hot air oven, Autoclave, Inspissator, Bacterial Filters, Water bath, VDRI rotation Centrifuge machine, Vacuum pump, media pouring chamber EUSA reader,etc</p> <p>Anaerobic culture, Inoculation techniques, subculture and maintenance of stock culture.Isolation and identification of bacteria (Cultural characters biochemical reaction) serotyping etc. Antimicrobial susceptibility tests</p>
		<p><b>SYSTEMIC BACTERIOLOGY</b></p> <p>More importance should be given to culture methods and identification of bacteria that other properties like Pathogenesis etc.</p> <p>Cocci - Staphylococci, streptococci,Pneumococci, Gonococci, Meniogococci.</p> <p>Bacilli – Corynebacterium, Bacillus, Clostridium, Nonsporing anaerobes, Enterobacteriaceae, E.Coll,Klebsiella, Salmonella, Shiegella, Proteus, Vibrio</p> <p>- Pseudomonas, Mycobacterium (M. tuberculosis, M. Leprae), Basic idea on</p> <p>Actinocycetes,Rickettsiaeae, - Spirochetes</p>
		<p><b>CLINICAL MICROBIOLOGY</b></p> <p>- Normal microbial flora of human body, Collection and transport of specimen</p> <p>- BacterimiaPyaemia, Septicemia, Pyrexia of unknown origin (P.U.O)</p> <p>- Meningitis, Food Poisoning , Respiratory Infection (Sore throat pneumonic, pulmonary Tuberculosis), Nosocomial Infections, Opportunistic Infection</p>
		<p><b>MYCOLOGY</b></p>



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		<ul style="list-style-type: none"><li>- Classification of pathogenic Fungi, Morphology of Fungi, Laboratory diagnosis of Fungi (KOH prepn. Culture media and methods, LCB mount, etc.)</li><li>- Brief idea on Dermatophytes, Candia Aspergillums, Cryptococcus and Opportunistic Fungi.</li></ul>
		<b>IMMUNOLOGY AND SEROLOGY</b> Emphasis on principal and uses/application ,Immunity –Basic principles and classification, Antigen, Antibody (Immunoglobulin's), Complement system, Antigen – Antibody reactions, Hypersensitivity- classification & different skin tests used for diagnosis., Immunodeficiency diseases including AIDS –in brief, Autoimmunity – Basic concept, Immuno-prophylaxis & Immunization schedule, Vaccines-classification & uses.
		<b>PARASITOLOGY</b> <ul style="list-style-type: none"><li>- Introduction &amp; classification of medically important parasites, Intestinal &amp; Tissue protozoa (E.histolylica, Giardia Primary Amoebic meningo-encephalitis)</li><li>- Malaria parasite, Leishmanial parasites, Tapeworms, Flukes of liver and , Intestine, Intestinal nematodes, Filarial worms and other tissue nematodes</li></ul>
		<b>VIROLOGY</b> <ul style="list-style-type: none"><li>- General Characters of viruses, Classification in brief and name of the diseases they produce., Hepatitis viruses, HIV, (Polio, Rabies, Rata, Measles, Dengue)</li><li>- Oncogenic viruses in brief, Collection and transport of virological specimens</li><li>- Laboratory diagnosis of viral infections (various methods of virus culture, serology etc.)</li></ul>
		<b>ANIMAL CARE</b> <ul style="list-style-type: none"><li>- Care of sheep and procedure to draw blood from sheep., Handling, feeding and Breeding of laboratory animals.</li></ul>

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