शहीदगंगालाल राष्ट्रिय हृदय केन्द्र
पदपुर्ति समिति
पद:वरीष्ठल्याब टेक्नोलोजिष्ट(सेवा - प्राविधिक, समूह - मेडिकल, उप-समूह - प्याथोलोजी) को खुल्ला/आन्तरिक प्रतियोगितात्मकलिखित परीक्षाको पाठ्यक्रम

एवं **परीक्षायोजना**

यस पाठ्यक्रम योजनालाई दुई चरणमाविभाजनगरिएको छ :

प्रथम चरण :– लिखित परीक्षा(Written Examination) पूर्णाङ्क :– २००

द्वितीय चरण :–अन्तर्वार्ता (Interview) पूर्णाङ्क :– ३०

प्रथम चरण(First Phase) :**<u>लिखित परीक्षा योजना(Written Examination Scheme)</u>**

Paper	Subject	Full Marks	Pass Marks	No. Questions & Weightage	Time Allowed
I	Technical Subject	100	40	50×2 = 100 (Objective Multiple Choice Questions)	1.00 hrs
II		100	40	6 ×10 = 60 8 ×5= 40 (Subjective Descriptive Type)	3.00 hrs

द्वितीय चरण(Second Phase)

Subject	Full Marks	Examination
Interview	30	Oral

<u>द्रष्टव्य</u> :

१. यो परीक्षा योजनालाई प्रथम चरण (लिखित परीक्षा) र द्वितीय चरण (अन्तर्वार्ता) गरी दुई चरणमाविभाजनगरिएको छ ।

२. लिखित परीक्षाको माध्यमभाषा नेपालीवाअंग्रेजीअथवा नेपाली र अंग्रेजीदुवै हुनेछ ।

३. प्रथम र द्वितीयपत्रको पत्रको विषयवस्तुएउटै हुनेछ ।

४. प्रथम र द्वितीयपत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।

५. वस्तुगतबहुवैकल्पिक(Multiple Choice)प्रश्नहरुको गलतउत्तर दिएमाप्रत्येक गलतउत्तर बापत २० प्रतिशतअङ्ककट्टागरिनेछ । तर उत्तर नदिएमा त्यस बापतअङ्कदिइने छैन र अङ्ककट्टापनिगरिने छैन ।

६. विषयगतप्रश्नको हकमाप्रत्येकखण्डकालागि छुट्टाछुट्टै उत्तरपुस्तिकाहरु हुनेछन् । परीक्षार्थीले प्रत्येक खण्डकाप्रश्नहरुको उत्तर सोहीखण्डकाउत्तरपुस्तिकामा लेख्नुपर्नेछ ।

७. यस पाठ्यक्रम योजनाअन्तर्गतकापत्र/विषयकाविषयवस्तुमा जेसुकै लेखिएको भएतापनिपाठ्यक्रममा परेकाकानून, ऐन, नियमविनियमतथानीतिहरु परीक्षाको मितिभन्दा ३ महिनाअगाडि (संशोधनभएकावा संशोधनभई हटाईएकावाथप गरी संशोधनभई) कायम रहेकालाई यस पाठ्क्रममा परेको सम्झनु पर्दछ ।

८. प्रथम चरणको परीक्षाबाटछनौट भएकाउम्मेदवारहरुलाई मात्रद्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।

९. पाठ्यक्रमलागू मिति :– २०७६।११।१

शहीदगंगालाल राष्ट्रिय हृदय केन्द्र
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पदःवरीष्ठल्याब टेक्नोलोजिष्ट(सेवा - प्राविधिक, समूह - मेडिकल, उप-समूह - प्याथोलोजी) को खुल्ला/आन्तरिक प्रतियोगितात्मकलिखित परीक्षाको पाठ्यक्रम

Paper I &II : - Technical Subject

Section (A): 50 % Marks

1. **Hematology**
   - 1.1. Cleaning of glasswares and safety precaution in the laboratory
   - 1.2. Collection and preservation of different samples for the laboratory
   - 1.3. Preparation of chemicals and different stains for the hematological tests
   - 1.4. Quality control in the laboratory / Management of lab
   - 1.5. Formation and development of Erythrocytes, Leucocytes, thrombocytes
   - 1.6. Principle and clinical procedure for
     - 1.6.1 Hemoglobin estimation and it's standard curve calibration
     - 1.6.2 Total count of W.B.C., R.B.C., Platelets and reticulocytes
     - 1.6.3 E.S.R., B.T., C.T., and RBC indices
     - 1.6.4 Foetalhaemoglobin estimation
     - 1.6.5 Coomb's tests
     - 1.6.6 Blood banking & Transfusion
     - 1.6.7 Coagulation profile (mechanism, disorder & investigations)
     - 1.6.8 LE cell preparation
     - 1.6.9 Tissue parasite
     - 1.6.10 Absolutes cell count
   - 1.7 Characteristics of Anemia, Leukaemia, Polycythemia, Leukamoid reaction, Thalassaemia&Haemoglobinopathies
   - 1.8 Principles and procedure of Osmotic fragility tests and cyto chemical stains
   - 1.9 Principle and procedure of G6PD, Hemoglobin electrophoresis
   - 1.10 Preparation of reagents for special haematological investigation
   - 1.11 Waste Disposal and Total Quality Management

2. **ClinicalMicrobiology**
   - 2.1 Bacteriology
     - 2.1.1 Classification of medically improtant bacteria
     - 2.1.2 Characteristics of Microorganism: Prokaryotes, Eukaryotes, Viruses
     - 2.1.3 Bacterial growth and nutritional requirements, uptake of nutrients, growth phages and sporulation
     - 2.1.4 Antimicrobial drugs and their mode of actions with reference to cell wall, cell membrane, Nucleic acid and protein synthesis
     - 2.1.5 Different methods of sterilization and disinfections
     - 2.1.6 Preparation of different media and ingredients uses and interpretation
     - 2.1.7 Preparation of chemicals and stains
     - 2.1.8 Cultural procedure of different samples aerobically and anaerobically
     - 2.1.9 Identification of bacteria and confirmative tests serologically and biochemically
     - 2.1.10 Different staining methods of bacteria and their principles
     - 2.1.11 T.BBactriology and skin scraping for A.F.B
     - 2.1.12 Water bacteriology
     - 2.1.13 C.S.F. and cavity fluids for culture
   - 2.2 Virology
     - 2.2.1 Classification of medically important viruses and mode of infection

2.2.2 Characteristic of viruses, nature of viruses, viral structure and replication
2.2.3 Definition of R.N.A. and D.N.A. viruses
2.2.4 Principle and methods of serological prcedure for HCV, HIV, HBsAg and HEv

2.3 Parasitology
2.3.1 Classification of medically important
2.3.1.1 Protozoal parasites
2.3.1.2 Helminthic parasites
2.3.1.3 Blood parasites
2.3.2 Methods of identification of different parasites from stool samples by
2.3.2.1 Wet preparation
2.3.2.2 Concentration methods
2.3.2.3 Cultural methods

2.4 Mycology
2.4.1 Identification of superficial, deep & systemic mycosis
2.4.2 Opportunistic mycosis
2.4.3 Examination and identification by different method and culture

2.5 Immunology
2.5.1 Principle and procedure for the estimation of:
2.5.1.1 V.D.R.L.(RPR)
2.5.1.2 T.P.H.A.
2.5.1.3 A.S.O.
2.5.1.4 C.R.P.
2.5.1.5 Rheumatoid factor
2.5.1.6 Pregnancy test
2.5.1.7 TORCH Range
2.5.1.8 Cancer Marker
2.5.1.9 Agglutination Reaction
2.5.1.10 Precipitation Reaction
2.5.1.11 Flocculation Reaction
2.5.1.12 ELISA
2.5.1.13 Haemagglutination Reaction

2.6 Waste Disposal and Total Quality Management
2.7 Semen analysis

Section (B): 50 % Marks

3. **Biochemistry**
3.1 Preparation of normal and molar solution
3.2 Preparation of different reagents required for biochemical test
3.3 Colorimeter and specto photometer
3.4 Flame Photometry
3.5 Carbohydrate metabolism:
3.5.1 Glycolysis
3.5.2 Glycogenesis
3.5.3 Glycogenolysis
3.5.4 Pentose phosphate pathway
3.5.5 Kreb's cycle
3.5.6 Gluconeogenesis

3.6 Protein metabolism
- 3.6.1 Transamination
- 3.6.2 Deamination
- 3.6.3 Urea cycle
- 3.6.4 Nitrogen balance
- 3.6.5 Creatinine and creatinine formation

3.7 Lipid metabolism
- 3.7.1 ′-oxidation
- 3.7.2 æ-oxidation
- 3.7.3 ¬-oxidation
- 3.7.4 Ketone bodies formation and their utilization
- 3.7.5 Ketosis
- 3.7.6 Cholesterol and triglucerides synthesis

3.8 Hormone
- 3.8.1 Introduction
- 3.8.2 Types
- 3.8.3 Origin
- 3.8.4 Definition
- 3.8.5 Classification
- 3.8.6 Regulation
- 3.8.7 Measurement by various methods including RIA, EIA

3.9 Principle and procedure of different methods for the estimation of biochemical tests
- 3.9.1 Sugar, Urea, Cratinine, Uric Acid, Billirubin, GPT, GOT, ALP, Lipid profile, Cardicprofile,Renal function test, Liver Function Test, Cleareance study, Amylase & Electrolytes
- 3.9.2 Cavity fluids examination
- 3.9.3 C.S.F. examination

3.10 Waste Disposal and Total Quality Management

4. **Histopathology**

4.1 Gross anatomy and histology of specimens and tissues of gastrointestinal (GIT), cardiovascular (CVS), respiratory (RS) systems

4.2 Normal physiology of above systems

4.3 Gross anatomical alterations in the surgically removed specimens

4.4 Gross pathological diagnosis of the lesions of gastrointestinal (GIT), cardiovascular (CVS), respiratory (RS) system

4.5 Different types and functions of fixatives in histopathology laboratory

4.6 Different types of chemicals and equipment used in tissue processing and procedure

4.7 Steps and principles of H and E staining and mounting

4.8 Interpretation the microscopic findings of various types of lesions of gastrointestinal (GIT), cardiovascular (CVS), and respiratory (RS) system

4.9 Biochemical changes in a tissue or organ in above mentioned conditions.

4.10 Diagnose the above mentioned lesions and differentiate them from other similar lesions in view of the clinical findings provided

4.11 Gross anatomy and histology of specimens and tissues of renal electrolytes and reproductive systems

4.12 Normal physiology of renal electrolytes and reproductive systems
4.13 Metabolism of carbohydrate, fat, protein, nucleic acids, vitamins, copper and minerals
4.14 Gross anatomical alterations in the surgically removed specimen of renal electrolytes respiratory systems and metabolic disorders
4.15 Gross pathological diagnosis of the lesions of renal electrolytes and reproductive systems with clinical data
4.16 Gross anatomical alterations in the surgically removed specimen of above mentioned systems
4.17 Correlate the gross findings with the microscopic features and clinical presentations
4.18 Frozen Section
4.18.1 Principle and function of cryostat
4.18.2 Frozen section of intraoperative specimens and diagnose

5. **Cytopathology**
5.1 Preparation of the above mentioned smears, fix and stain with Pap staining and mount them
5.2 Different types of fixatives used in cytopathological laboratory and their functions
5.3 Fine needle aspiration biopsy procedure, wet and dry smears fix and stain the slides with Pap stain and Giemsa stain
5.4 Principle of Pap stain and Giemsa stain
5.5 Interpret the cellular morphological changes in sputum, vaginal, cervical and endometrial specimen and neoplastic conditions
5.6 Correlate with the clinical findings and diagnose
5.7 Principles of cytocentrifuge and Millipore filtration
5.8 Normal cell morphology in brushing, washing and body fluids smears.
5.9 Interpret the cellular morphological changes in brushing, washing and body fluid smears in different inflammatory, non-inflammatory, non-neoplastic and neoplastic conditions
5.10 Correlate the findings with the clinical findings and diagnose them.
5.11 Sex chromatin, methods of obtaining and preparation of smears for the examination of sex chromatin, Interpret the findings
5.12 Congenital anomalies in relation to sex chromosome
5.13 Interpret FNAC smears and diagnose the lesions