शहीद गंगालाल राष्ट्रिय हृदय केन्द, पदपुर्ति समिति

पद : ल्याव टेक्नोलोजिष्ट (सेवा -प्राविधिक, समूह - मेडिकल, उप-समूह - प्याथोलोजि)

रा.प. तृतीय (ख) को खुल्ला /आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

एवं परीक्षा योजना

यस पाठ्यक्रम योजनालाई दुई चरणमा विभाजन गरिएको 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	(Objective Multiple Choice Questions) 50× 2 = 100	1.00 hrs
II		100	40	(Subjective Descriptive Type) 6 × 10 = 60 (Long answer) 2 × 20 = 40 (Problem Solving)	3.00 hrs

द्वितीय चरण (Second Phase)

Subject	Full Marks	Examination
Interview	30	Oral

<u>द्रष्टव्य</u> :

१. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।

२. प्रथम र द्वितीय पत्रको विषयवस्तु एउटै हुनेछ । तर प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।

३. वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरुको गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २० प्रतिशत अङ्क कट्टा गरिनेछ । तर उत्तर नदिएमा त्यस बापत अङ्क दिइने छैन र अङ्क कट्टा पनि गरिने छैन ।

४. परीक्षार्थीले वस्तुगत बहुवैकल्पिक प्रश्नको उत्तर लेख्दा अंग्रेजी ठूलो अक्षर (Capital letter) A, B, C, D मा लेख्नुपर्नेछ । सानो अक्षर (Small letter) a, b, c, d लेखेको वा अन्य कुनै सङ्केत गरेको भए सबै उत्तरपुस्तिका रद्द हुनेछ ।

५. बहुवैकल्पिकप्रश्नहरु हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।

६. विषयगत प्रश्नहरुको हकमा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरु (Short notes) सोध्न सकिने छ ।

७. विषयगत प्रश्नमा प्रत्येक पत्र/विषयका प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरु हुनेछन् । परिक्षार्थीले प्रत्येक खण्डका प्रश्नहरुको उत्तर सोही खण्डका उत्तरपुस्तिकामा लेख्नुपर्नेछ ।

८. परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।

९. **द्वितीय पत्रमा तोकिएको पाठ्यक्रमबाट सम्बन्धित पदको लागि आवश्यक Competency मा आधारित कम्तीमा दुई वटा Competency Based प्रश्नहरु लिखित परीक्षामा सोधिनेछ ।**

१०. यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भएतापनि पाठ्यक्रममा परेका कानून, ऐन, नियम, विनियम तथा नीतिहरु परीक्षाको मितिभन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्क्रममा परेको सम्झनु पर्दछ ।

११. प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।

१२. पाठ्यक्रम लागु मिति :**<u>आ.व. २०७८/०७९ देखि</u>**

शहीद गंगालाल राष्ट्रिय हृदय केन्द, पदपुर्ति समिति
पद : ल्याव टेक्नोलोजिष्ट (सेवा -प्राविधिक, समूह - मेडिकल, उप-समूह - प्याथोलोजि)
रा.प. तृतीय (ख) को खुल्ला /आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

Paper I & II: - Technical Subject
Section (A): 60% Marks
For Paper I (30 MCQs ×2 marks) &
For Paper II (4×10 marks, 1×20 marks)

1. **Basics:**
   - 1.1 Microscope: Principle, operation, care and use
   - 1.2 Cleaning of glassware and safety precaution in the laboratory
   - 1.3 Collection and preservation of different samples for the laboratory
   - 1.4 Sterilization: General Principal of Sterilization, Classification, Physical, Mechanical Chemical Method, Sterilization Media, Syringes, Glassware and Apparatus
   - 1.5 Quality control in the laboratory
   - 1.6 Total quality management

2. **Haematology and Blood Banking:**
   - 2.1 Preparation of chemicals and different stains for the hematology test
   - 2.2 Formation and development of Erythrocytes, Leucocytes and thrombocytes
   - 2.3 Principle and clinical procedure for:
     - 2.3.1 Hemoglobin estimation and it's standard curve calibration
     - 2.3.2 Total count of W.B.C., R.B.C., Platelets and reticulocytes
     - 2.3.3 E.S.R., B.T., C.T., and RBC indices
     - 2.3.4 Electrophoresis
     - 2.3.5 Coomb's tests
     - 2.3.6 Coagulation profile (mechanism, disorder & investigations)
     - 2.3.7 LE cell preparation
     - 2.3.8 Tissue parasite
   - 2.4 Characteristics of Anemia, Leukaemia, Polycythemia, Leukamoid reaction, Thalassaemia & Haemoglobinopathies.
   - 2.5 Blood grouping system and various blood groups
   - 2.6 Blood donors and preparation of blood donors
   - 2.7 Principle and procedures of the proper storage of blood
   - 2.8 Coomb's test: Direct and Indirect
   - 2.9 Transfusion reactions

3. **Microbiology and Immunology:**
   - 3.1 Classification of medically important bacteria
   - 3.2 Characteristics of Microorganism: Prokaryotes, Eukaryotes, Viruses
   - 3.3 Bacterial growth and nutritional requirements, uptake of nutrients, growth phages and sporulation
   - 3.4 Antimicrobial drugs and their mode of actions with reference to cell wall, cell membrane, Nucleic acid and protein synthesis
   - 3.5 Antimicrobial susceptibility testing by disc diffusion methods and minimum inhibitory concentration (MIC)
   - 3.6 Preparation of different media and ingredients uses and interpretation
   - 3.7 Preparation of different stains using bacteriology
   - 3.8 Cultural procedure of different samples aerobically and anaerobically
   - 3.9 Identification of bacteria and confirmative tests serologically and biochemically

3.10 Different staining methods of bacteria and their principles
3.11 Classification of medically important viruses and mode of infection
3.12 Characteristic of viruses, nature of viruses, viral structure and replication
3.13 Definition of R.N.A. and D.N.A. viruses
3.14 Principle and methods of serological procedure for HCV, HIV and HBsAg
3.15 Classification of medically important
  3.15.1 Protozoal parasites
  3.15.2 Helminthic parasites
  3.15.3 Blood parasites
3.16 Methods of identification of different parasites from stool samples
3.17 Method of identification of blood parasites
3.18 Routine Examination and special test in Urine
3.19 Terminologies used in mycology
3.20 Collection techniques of various clinical samples for the diagnosis of fungal infection (skin/nail/hair sample, corneal scraping, sputum and biopsy materials)
3.21 Fungal culture media
3.22 Common parasites in Nepal
3.23 Principle and procedure for the estimation of:
  3.23.1 VDRL
  3.23.2 ASO
  3.23.3 CRP
  3.23.4 Rheumatoid factor
  3.23.5 ELISA
  3.23.6 Blood Grouping
3.24 PCR test: Principle and uses
3.25 Universal precaution in microbiology laboratory and safe waste disposal of infected material

4. **Biochemistry:**
4.1 Preparation of normal and molar solution
4.2 Preparation of different reagents required for biochemical test
4.3 Colorimeter and spectrophometer
4.4 Flame Photometry
4.5 Carbohydrate metabolism
  4.5.1 Glycolysis
  4.5.2 Glycogenesis
  4.5.3 Glycogenolysis
  4.5.4 Pentose phosphate pathway
  4.5.5 Kreb's cycle
  4.5.6 Gluconeogenesis
4.6 Protein metabolism
  4.6.1 Transamination
  4.6.2 Deamination
  4.6.3 Urea cycle
  4.6.4 Nitrogen balance
  4.6.5 Creatinine and creatinine formation
4.7 Lipid metabolism
  4.7.1 Alpha, beta, gamma- oxidation
  4.7.2 Ketosis & Ketone bodies formation and their utilization

4.7.3 Cholesterol and triglycerides synthesis

4.8 Nucleotide metabolism

4.8.1 Purine and pyrimidine biosynthesis and its regulation

4.9 Inborn error of metabolism

4.10 Principle, procedure, precautions, calibration of graph & normal value in the estimation of: Sugar, Urea,Creatinine, Amylase, Bilirubin, GPT, GOT, calcium, magnesium, Cholesterol, Triglycerides, HDL, LDL, uric acid and protein.

4.11 ABG test

4.12 Principle, normal values and interpretation of Thyroid function test

4.13 The lab hazards and precautions to be taken while working in clinical biochemistry lab

Section (B): 40% Marks

For Paper I (20 MCQs ×2 marks) &
For Paper II (2×10 marks, 1×20 marks)

5. **Miscellaneous:**

5.1 Anatomy and physiology of cardiovascular system

5.2 Diabetes mellitus & abnormalities of metabolism of carbohydrates

5.3 Etiology, clinical features and investigations for Rheumatic heart disease and infective endocarditis.

5.4 Cardiac enzymes : CK, CK-MB and Troponin- significance and interpretation.

5.5 Chemiluminescent immunoassay (CLIA): Principles, Uses, advantages and disadvantages

5.6 Principle, normal value and significance of following tests:

5.6.1 NTProBNP

5.6.2 Procalcitonin

5.6.3 D-dimer

5.6.4 HBA1C

5.6.5 HsCRP

6. **Histology/Cytology:**

6.1 Preparation of different types of fixatives and their uses

6.2 Procedural steps, reagents, and possible errors of tissue processing

6.3 Description of different types of microtome, their principles and methods of cutting section from the paraffin block tissue

6.4 Methods of decalcification

6.5 FNAC, fluid cytology and uses.

6.6 Preparation of routine and special histological and cytological stains and staining procedure

6.7 Principles and methods of staining and mounting the tissue section on the glass slides

6.8 Different types of microscope

7. **General information related to Shahid Gangalal National Heart Centre**