शहीद धर्मभक्त राष्ट्रिय प्रत्यारोपण केन्द्र

मानव अङ्ग प्रत्यारोपण विकास समिति, प्रविधिक सेवा, प्याथोलोजी समूह, जनरल प्याथोलोजी उपसमूह, आठौं तह, रजिष्ट्रार (प्याथोलोजी) पदको खुला तथा आन्तरिक प्रतियोगितात्मक 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) : लिखित परीक्षा योजना (Written Examination Scheme)

Paper	Subject		Marks	Full Marks	Pass Marks	No Questions & Weightage	Time Allowed
I	General Subject	Management	25	100	40	5 × 5 = 25 (Short answer)	3.00 hrs
		General Health Issues & Related Legislations	40			4 × 5 = 20 (Short answer) 2 × 10 = 20 (Long answer)	
		Human Organ Donation & Transplantation	35			3 × 5 = 15 (Short answer) 2× 10 = 20 (Long answer)	
II	Technical Subject (Pathology)			100	40	6 × 10 = 60 (Short answer) 2 × 20 = 40 (Long answer)	3.00 hrs

द्वितीय चरण (Second Phase) : अन्तर्वार्ता (Interview)

Subject	Full Marks	Examination
Interview	30	Oral

द्रष्टव्य :

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

२. प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।

३. लिखित परीक्षामा सोधिने प्रश्नसंख्या र अङ्कभार यथासम्भव सम्बन्धित पत्र/विषयमा दिईए अनुसार हुनेछ ।

४. विषयगत प्रश्नमा एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरू (Short notes) सोध्न सकिनेछ ।

५. प्रथम र द्वितीय पत्रमा प्रत्येक खण्ड (Section) को लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन् । उम्मेदवारले प्रत्येक खण्ड (Section) को प्रश्नको उत्तर छुट्टाछुट्टै उत्तरपुस्तिकामा लेख्नुपर्नेछ ।

६. यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जुन सुकै कुरा लेखिएको भए तापनि पाठ्यक्रममा परेका कानून, ऐन, नियम, विनियम तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्क्रममा परेको सम्झनु पर्दछ ।

७. प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।

८. **पाठ्यक्रम स्वीकृत मिति :- २०८१/०८/०४**

शहीद धर्मभक्त राष्ट्रिय प्रत्यारोपण केन्द्र

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Paper I: General Subject

(Management, Human Organ Donation & Transplantation, General Health Issues & Related Legislations)

Section (A)

Short Questions	5 Question × 5 Marks = 25 Marks	**25 Marks**

1. **Management**
   - 1.1 Management: concept, principles, functions, scope, role, level and skills of managers
   - 1.2 Participative management: concept, advantages and disadvantages, techniques of participation
   - 1.3 Time management: concept, advantages, and disadvantages
   - 1.4 Conflict management: concept, approaches to conflict, levels of conflict, causes of conflict and strategies for conflict management
   - 1.5 Stress management: concept, causes and sources of stress, techniques of stress management
   - 1.6 Planning: concept, principles, nature, types, instrument and steps
   - 1.7 Motivation: concept, theories of motivation, reason for low productivity, techniques of employee motivation
   - 1.8 Leadership: concept, functions, leadership styles, leadership and management effectiveness
   - 1.9 Coordination: concept, need, types, techniques & approaches of effective coordination
   - 1.10 Communication: concept, communication process and barrier to effective communication, techniques for improving communication
   - 1.11 Decision making: Importance, types, rational process of decision making, problem solving techniques, improving decision making
   - 1.12 Fundamental principles of healthcare institution and hospital management

Section (B)

Short Question	4 Question × 5 Marks = 20 Marks	**40 Marks**
Long Question	2 Question × 10 Marks = 20 Marks	

2. **General Health Issues (25 Marks)**
   - 2.1 Present Constitution of Nepal (health and welfare issues)
   - 2.2 International health agencies: role and responsibilities of WHO, UNICEF, UNFPA and interagency relationships
   - 2.3 Medical ethics
   - 2.4 Indigenous and traditional faith healing and health practices
   - 2.5 Supervision, types and its usage in health sector
   - 2.6 Monitoring and evaluation system in health Sector
   - 2.7 Health management information system
   - 2.8 Health insurance and financing in health care
   - 2.9 Effects of environment in public health: air pollution, domestic pollution, noise pollution
   - 2.10 Importance of water, sanitation and hygiene in public health

2.11 Effects of disaster in public health: deforestation, landslide, flood, earthquake & fire
2.12 Health volunteers' involvement in health service delivery
2.13 Counseling: concept, type, importance and its application in health service delivery

3. Related Legislations (Policy, Act and Regulations) (15 Marks)

3.1 National Health Policy, 2076
3.2 Human Organ Transplantation (Regulation and Prohibition) Act, 2055 with amendment
3.3 Human Organ Transplantation Regulations, 2073
3.4 Guidelines on medical treatment of deprived citizens program, 2080
3.5 Human Organ Transplant Development Committee Personnel Administration Rules, 2069 (मानव अंग प्रत्यारोपण विकास समिति कर्मचारी प्रशासन नियमवाली, २०६९)
3.6 Human Organ Transplant Development Committee Formation Order, 2068 (मानव अंग प्रत्यारोपण विकास समिति गठन आदेश, २०६८)
3.7 Health Workers and Health Institutions Security Act, 2066 & Health Workers and Health Institutions Security Regulation, 2069
3.8 Health Insurance Act, 2074
3.9 Health Service Act, 2053
3.10 Public Health Service Act, 2075

Section (C)

Short Question	3 Question × 5 Marks = 15 Marks	**35 Marks**
Long Question	2 Question × 10 Marks = 20 Marks	

4. General Concept of Solid Organ Donation and Transplantation

4.1 Basic Concept of Transplant Science
- 4.1.1 Transplant immunology
- 4.1.2 Basic terminology : autologous graft, syngeneic graft, allogeneic graft, xenogeneic graft, alloantigen, alloreactive, immune rejection
- 4.1.3 Types of graft rejection : hyper acute rejection, acute cellular rejection, acute antibody mediated rejection, chronic rejection
- 4.1.4 Immunosuppressant drugs used in organ transplantation
- 4.1.5 Evaluation of donor and recipient and management
- 4.1.6 Organ preservation and procurement
- 4.1.7 Role of immunological test in transplantation : Human leucocyte antigen (HLA), Donor specific antibodies (DSA), Panel reactive antibodies (PRA), Complement dependent cytotoxity (CDC) cross match, flow cross match
- 4.1.8 Complications among organ transplant recipients and management

4.2 Concepts of Organ Donation and Transplantation Process
- 4.2.1 Demand vs. supply gap in transplantation
- 4.2.2 Health promotion and prevention of organ failure
- 4.2.3 Organ failure, organ donation, transplant etc
- 4.2.4 Organ recovery process
- 4.2.5 Organ donation process
- 4.2.6 Brain death donation: definition, declaration & management

4.2.7 Contraindication of transplantation in brain death donation
4.2.8 Hurdles in brain death donation program
4.2.9 Brain death, criteria for certifying brain death and tests to confirm diagnosis
4.2.10 Concept of circulatory death : donation after circulatory death (DCD), types, different from brain death donation
4.2.11 Allocation of Kidneys, Liver, Heart and Lungs in Deceased donor transplantation
4.2.12 Preservation and transportation of retrieved organs

4.3 History of organ transplantation in Nepal
4.4 Role, scope and importance of Shahid Dharmabhakta National Transplant Center in organ transplantation
4.5 Religion and culture in organ donation and transplantation

5. Ethical Issues in Organ Donation and Transplantation

5.1 Patient confidentiality and privacy legislation
5.2 Patient autonomy
5.3 Principles of informed consent and decision making
5.4 Next of kin designation
5.5 End of life decision making
5.6 Organ procurement for transplantation
5.7 Management and review of adverse events
5.8 Communication with families in crisis

शहीद धर्मभक्त राष्ट्रिय प्रत्यारोपण केन्द्र

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Paper II: Technical subject

(Pathology)

Section A

Short Question	3 Question × 10 Marks = 30 Marks	**50 Marks**
Long Question	1 Question × 20 Marks = 20 Marks	

1. Histopathology (20 marks)

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

- 1.1.1 Describe the normal physiology of above systems
- 1.1.2 Describe the normal physiology of above systems
- 1.1.3 Identify and describe the gross anatomical alterations in the surgically removed specimens
- 1.1.4 Correlate the gross pathological diagnosis of the lesions of gastrointestinal (GIT), cardiovascular (CVS), respiratory (RS) system with the given clinical information
- 1.1.5 Different types and functions of fixatives in histopathology laboratory
- 1.1.6 Different types of chemicals, and equipment used in tissue processing and perform the procedure
- 1.1.7 Steps and principles of H and E staining and mounting and perform them
- 1.1.8 Interpret the microscopic findings of various types of lesions of gastrointestinal (GIT), cardiovascular (CVS), and respiratory (RS) system.
- 1.1.9 Biochemical changes in a tissue or organ in above mentioned conditions
- 1.1.10 Diagnose the above mentioned lesions and differentiate them from other similar lesions in view of the clinical findings provided
- 1.1.11 Gross anatomy and histology of specimens and tissues of renal electrolytes and reproductive systems.
- 1.1.12 Normal physiology of renal electrolytes and reproductive systems.
- 1.1.13 Metabolism of carbohydrate, fat protein, nucleic acids, vitamins, copper and minerals.
- 1.1.14 Gross anatomical alterations in the surgically removed specimen of renal electrolytes respiratory systems and metabolic disorders
- 1.1.15 Correlate the gross pathological diagnosis of the lesions of renal electrolytes and reproductive systems with clinical data
- 1.1.16 Interpret the microscopic findings of various lesions of renal electrolyte reproductive system and metabolic disorders
- 1.1.17 Diagnose and differentiate with various other lesions of above mentioned system
- 1.1.18 Gross anatomy and histology of specimen and tissues from musculoskeletal system, neurosensory systems, eye, ENT and skin
- 1.1.19 Describe the normal physiology of the above mentioned systems
- 1.1.20 Gross anatomical alterations in the surgically removed specimen of above mentioned systems
- 1.1.21 Correlate the gross findings with the microscopic features and clinical presentations
- 1.1.22 Explain the use of museum and importance of preservation of specimens

1.2 Frozen Section

- 1.2.1 Principle and function of cryostat

1.2.2 Perform frozen section of intraoperative specimens and diagnose

2. Cytopathology (20 marks)

2.1 Normal cell morphology in vaginal, cervical and endometrial specimens and sputum specimen
2.2 Prepare the above mentioned smears, fix and stain with Pap staining and mount them
2.3 Different types of fixatives used in cytopathological laboratory and explain their functions
2.4 Perform fine needle aspiration biopsy procedure, prepare wet and dry smears fix and stain the slides with Pap stain and Giemsa stain
2.5 Principle of Pap stain and Giemsa stain
2.6 Interpret the cellular morphological changes in sputum, vaginal, cervical and endometrial specimen and neoplastic conditions
2.7 Correlate with the clinical findings and diagnose
2.8 Different methods of preparing smears from body fluids including urine and CSF
2.9 Principles of cytocentrifuge and Millipore filtration
2.10 Describe the normal cell morphology in brushing, washing and body fluids smears.
2.11 Interpret the cellular morphological changes in brushing, washing and body fluid smears in different inflammatory, non-inflammatory, non-neoplastic and neoplastic conditions
2.12 Correlate the findings with the clinical findings and diagnose them
2.13 Sex chromatin. Describe the methods of obtaining and preparation of smears for the examination of sex chromatin
2.14 Interpret the findings
2.15 Congenital anomalies in relation to sex chromosome
2.16 Interpret FNAC (Fine needle Aspiration cytology) smears and diagnose the lesions

3. Others (10 marks)

3.1 Autopsy pathology
- 3.1.1 Perform a complete/partial autopsy
- 3.1.2 Identify the gross and microscopic features found in autopsy body and tissue sections respectively and correlate it with clinical history and diagnosis
- 3.1.3 Write the provisional and final anatomical diagnosis reports correctly

3.2 Blood Bank
- 3.2.1 Perform blood grouping and Rh typing tests and cross matching
- 3.2.2 Perform Coombs test
- 3.2.3 Explain the principles and interpretations of above tests

3.3 **Medical statistics and information technology**
- 3.3.1 Importance of statistical methods in assessing data from patient material and experimental studies, correlation coefficient, expected versus observed and their interpretations
- 3.3.2 Calculate mean, standard deviation and standard error from given experimental data
- 3.3.3 Use of the computer and other telecommunication devices like the fax for the storage, retrieval and sending of information.

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Section B

Short Question	3 Question × 10 Marks = 30 Marks	**50 Marks**
Long Question	1 Question × 20 Marks = 20 Marks	

4. Haematopathology (20 marks)

4.1 Normal hemopoiesis
4.2 Erythropoiesis
4.3 The structure, function, synthesis and metabolism of haemaglobin
4.4 Classify the different types of anaemias
4.5 The aetiopathogenesis and morphological findings in the peripheral and bone marrow smears in different types of anaemia and correlate with clinical data and diagnose correctly
4.6 Perform routine as well as the following haematological tests and explain their principle:
  4.6.1 Reticulocyte count
  4.6.2 Osmotic fragility test
  4.6.3 Foetal haemoglobin
  4.6.4 cell phenomenon
  4.6.5 Haemoglobin electrophoresis
  4.6.6 Serum Iron, Folic acid, Vitamin B_{12}
  4.6.7 Total Iron binding capacity
  4.6.8 Serum ferritin
4.7 Perform a fine needle bone marrow aspiration and stain with Wright's stain.
4.8 Interpret and diagnose the morphological changes in the blood and bone marrow specimen
4.9 Perform the common haematological procedures and interpret the results
4.10 Perform cytochemical test and interpret
4.11 Classify Leukaemia
4.12 Different types and their morphological features
4.13 Principles and interpretation of
  4.13.1 Bleeding time
  4.13.2 Clotting time
  4.13.3 Prothrombin time
  4.13.4 Activated partial thromboplastine time
  4.13.5 Platelet function test
  4.13.6 Factor VII and IX Assay
  4.13.7 Bence Jones protein
4.14 Plan a strategy of investigations for common haematological diseases

5. Clinical Microbiology (10 marks)

5.1 Perform the routine examination of urine and faeces and interpret the findings correctly
5.2 Perform complete examination of CSF
5.3 Perform examination of peripheral blood for blood parasites
5.4 Semen analysis
5.5 Identify the common aerobic and anaerobic bacteria in a culture plate
5.6 Perform the Gram's stain and identify the common bacteria
5.7 Perform sensitivity reactions of common bacteria
5.8 Principle of Gram's stain and ZN stain

5.9 Transplant Pharmacology
  5.9.1 Immunosuppressants
  5.9.2 Antimicrobial agent (Antibiotic, Antiviral, Antifungal, Antiprotozoal agent)
5.10 Importance of collection of specimens of culture
5.11 Principle of HbSAg, HIV tests

6. Clinical Chemistry (10 marks)

6.1 Perform and interpret correctly the routine clinical chemistry tests
6.2 Working principles of spectrophotometer, colorimeter, flame photometer, blood gas analyzer, electrophoresis and automation in laboratory medicine

7. Immunology (10 marks)

7.1 Observe and interpret simple immunological tests
7.2 Agar Gel precipitation
7.3 Haemaglutination
7.4 Immunoelecrophoresis
7.5 Identification of T and B cells in peripheral blood
7.6 Immuno Fluorescence technique
7.7 Counter current electrophoresis for demonstration of antigen
7.8 ELISA techniques
7.9 Explain the principle lying behind these tests
7.10 Principle of fluorescent microscopy