

**शहीद धर्मभक्त राष्ट्रिय प्रत्यारोपण केन्द्र**  
**मानव अङ्ग प्रत्यारोपण विकास समिति, प्रविधिक सेवा, विविध समूह, सातौं तह, ट्रान्सप्लान्ट कोअर्डिनेटर 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)**

पत्र	विषय	पूर्णाङ्क	उतीर्णाङ्क	परीक्षा प्रणाली		प्रश्नसंख्या X अङ्क	समय
प्रथम	General Technical Subject	१००	४०	वस्तुगत	बहुवैकल्पिक प्रश्न	१०० प्रश्न x १ अङ्क	१ घण्टा ३० मिनेट
द्वितीय	Technical Subject	१००	४०	विषयगत	छोटो उत्तर आउने प्रश्न	४ प्रश्न x ५ अङ्क	३ घण्टा
					लामो उत्तर आउने प्रश्न	८ प्रश्न x १०अङ्क	

**द्वितीय चरण (Second Phase) : अन्तर्वार्ता (Interview)**

विषय	पूर्णाङ्क	परीक्षा प्रणाली
अन्तर्वार्ता (Interview)	30	मैखिक (Oral)

**द्रष्टव्य :**

- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुन सक्नेछ ।
- प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
- लिखित परीक्षामा सोधिने प्रश्नसंख्या र अङ्कभार यथासम्भव सम्बन्धित पत्र/विषयमा दिईए अनुसार हुनेछ ।
- वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरूको 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 ।
- वस्तुगत बहुवैकल्पिक हुने परीक्षामा परीक्षार्थीले 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 ।
- बहुवैकल्पिक प्रश्नहरू हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।
- विषयगत प्रश्नहरूको हकमा 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 सकिने छ ।
- विषयगत प्रश्न हुने पत्रमा प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन् । परीक्षार्थीले प्रत्येक खण्डको प्रश्नको उत्तर सोही खण्डको उत्तरपुस्तिकामा लेख्नुपर्नेछ ।
- 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 पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।
- पाठ्यक्रम स्वीकृत मिति :- २०८१/०८/०४

**Paper I: General Technical Subject**

**1. Basic health Sciences (20 Marks)**

- 1.1 Anatomy and physiology of all body systems
- 1.2 Body mechanisms, Fluid and electrolyte, Osmosis, Diffusion, Acid base balance
- 1.3 Pathophysiology: Acute Tubular Necrosis, Inflammation, Thrombosis, Embolism, Wound healing, Organ failure (Acute/ Chronic), Kidney stones, Pain, Opportunistic infection, Graft Rejection
- 1.4 Electrolyte Imbalance: Hyponatremia, Hyponatremia, Hyperkalemia, Hypokalemia, Hypercalcemia, Hypocalcemia, Hyperphosphatemia, Hypophosphatemia, Hypermagnesemia, Hypomagnesemia
- 1.5 Hepatic/biliary Disorders: Review of structure and functions of hepatic and biliary system Laboratory and diagnostic investigations, Etiology / risk factors, pathophysiology, preventive, medical /surgical management for the following conditions:  
- Hepatic dysfunction( Hepatitis), Hepatic disorder (Hepatic cirrhosis) cancer of liver, liver abscess, liver trauma), Biliary disorders (Cholecystitis, Cholelithiasis)
- 1.6 Urinary Disorders: Review, Structure and function of urinary system. Laboratory investigation and analysis, Etiology / risk factors, pathophysiology, preventive measures, medical/surgical management of the following conditions: Urinary and renal dysfunction (Urinary retention, urinary incontinence, neurogenic bladder), Urinary and renal disorders (Urinary tract infections, pyelonephritis, glomerulonephritis, nephritic syndrome, urolithiasis, renal cancer, Acute renal failure, Chronic Renal Failure). Other renal and urinary tract disorders (Nephrosclerosis, Hydronephrosis, and urethritis - Other urinary disorders (Polycystic disease, vascular disorders, and trauma of urinary tract).
- 1.7 Cardiovascular & Circulatory Disorders: Review, Structure and function of cardiovascular system, Laboratory and diagnostic investigation, Coronary artery disease (Angina pectoris, myocardial infarction), Conduction disorders (Heart block, Arrhythmia, Cardiac pulmonary resuscitation), Congestive heart failure: Pulmonary edema, cardiogenic shock/thromboembolism, pericardial effusion and cardiac tamponade, cardiac arrest, Complications from heart disease: Acute pulmonary edema, congestive heart failure, cardiogenic shock, Vascular disorders: Arterial sclerosis, atherosclerosis, hypertension, arterial embolism, aneurysm, thrombophlebitis, varicose veins, venous thrombosis, Cardiac rehabilitation, Coronary artery bypass graft (CABG), Defibrillator / cardio version
- 1.8 Neurological disorder : Review the structure and function of nervous system o Etiology / risk factors, patho-physiology, preventive measures, medical / surgical management, cerebrovascular disease (Transient ischemic attack, stroke) Neurologic trauma: (Head injury, spinal cord injury) Intracranial infections: Meningitis, encephalitis brain abscess, intracranial aneurism. - Degenerative neurologic disorders:(Multiple sclerosis, Parkinson's disease, Huntington's disease, Alzheimer's disease, muscular dystrophies, seizure disorders, myasthenia gravis) - Cranial nerve

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disorders: Neuralgia, Bell's palsy - Disorders of the peripheral nervous system  
(Guillain Barre syndrome)

1.9 Indigenous and traditional faith healing and health practices

**2. Organ donation and transplantation (Kidney, Liver, Pancreas, Heart and Lungs) (30 Marks)**

- 1.1 Basic concept of immunology and immunological tests- Human leucocyte antigen (HLA), donor specific antibodies (DSA), Panel reactive antibodies (PRA) and complement dependent cytotoxicity (CDC) cross match
- 2.1 Basic concept of organ failure, global and national scenario, complications and treatment modalities
- 2.2 History of organ transplantation in Nepal
- 2.3 Concept of organ donation and transplantation
- 2.4 Pre and post-transplant care of organ donor and recipient
- 2.5 Important drugs used in organ transplantation, brief mechanism of action and adverse reactions
- 2.6 Opportunistic Infections in Organ Transplantation, Standard precaution for infection control
- 2.7 Immunology and immunosuppressant drugs used in organ transplantation
- 2.8 Complications among organ transplant recipients and management

**3. Human Organ Transplant Act and Regulations (10 Marks)**

- 3.1 Human Organ Transplantation (Regulation and Prohibition) Act, 2055 with amendment.
- 3.2 Human Organ Transplantation Regulations, 2073
- 3.3 Guidelines on medical treatment of deprived citizens program, 2080
- 3.4 Human Organ Transplant Development Committee Personnel Administration Rules, 2069 (मानव अंग प्रत्यारोपण विकास समिति कर्मचारी प्रशासन नियमवाली, २०६९)
- 3.5 Human Organ Transplant Development Committee Formation Order, 2068 (मानव अंग प्रत्यारोपण विकास समिति गठन आदेश, २०६८)

**4. Brain death donation (5 Marks)**

- 4.1 Concept brain death donation
- 4.2 Declaration
- 4.3 Organ Allocation Criteria for transplantation

**5. National Health Policy, 2019 (5 Marks)**

**6. Comprehensive Care and Management in Organ Donation and Transplantation (10 Marks)**

- 6.1 Grief counseling of Donor Family
- 6.2 Psychological issues of a patient with chronic diseases
- 6.3 Recipient counseling
- 6.4 Recipient work up for organ transplantation-Organ Harvesting
- 6.5 Organ preservation solutions
- 6.6 Organ preservation techniques

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- 6.7 Organ transportation
- 6.8 Follow-up of transplanted patient

**7. Management (20 Marks)**

- 7.1 Management: - concept, principles, functions
- 7.2 Conflict management: concept, causes of conflict and strategies for conflict management
- 7.3 Leadership: Concept, functions, leadership styles
- 7.4 Coordination: Concept, and approaches of effective coordination
- 7.5 Communication: Concept, communication process and barrier to effective communication, techniques for improving communication
- 7.6 In-service education: Planning, organizing, conducting, clinical teaching
- 7.7 Teaching and Learning: methods and media
- 7.8 Health Research: concept, types, design, ethics, sampling, data collection methods, analysis and report writing

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**Paper II: Technical Subject**

**Section A**

Short Question	2 Question × 5 Marks = 10 Marks	<b>50 Marks</b>
Long Question	4 Question × 10 Marks = 40 Marks	

**1. Immunology, Tissue Typing and cross matching (10 Marks)**

- 1.1 Introduction to immunology
- 1.2 Defense mechanism of the body
- 1.3 Antigen and antibody – types
- 1.4 Hypersensitivity reaction –types
- 1.5 Immunoassay - Mention agglutination, precipitation, ELISA, Western blot, RIA
- 1.6 Concepts of basic immunology such as rejection, and immunosuppression
- 1.7 Concept of blood/ tissue typing and cross-matching Human leucocyte antigen (HLA), donor specific antibodies (DSA), Panel reactive antibodies (PRA) and complement dependent cytotoxicity (CDC) cross match
- 1.8 Indications and contraindications for tissue typing and cross-matching

**2. Renal Replacement Therapy and Plasmapheresis (5 Marks)**

- 2.1 Hemodialysis
- 2.2 Peritoneal Dialysis
- 2.3 Kidney Transplantation
- 2.4 Continuous Renal replacement Therapy and Plasmapheresis

**3. Living organ/ tissue donation and transplantation (10 Marks)**

- 3.1 Concepts of organ donation and transplantation
- 3.2 Diseases responsible for organ and tissue failure
- 3.3 Indications and contraindications for living organ transplantation
- 3.4 Selection/evaluation process of live donation
- 3.5 Medical, psychosocial, social aspects, and economic determinants of donor and/or candidate suitability
- 3.6 Benefits of live donation and Transplantation
- 3.7 Legal and ethical issues related with living donation
- 3.8 Process of organ preservation and the quality parameters to be followed while retrieving organs

**4. Deceased Organ Donation and Transplantation (10 Marks)**

- 4.1 Brain Stem Death
  - 4.1.1 Anatomy and physiology of the brain and cranial nerves,
  - 4.1.2 Functions and brain stem reflexes
  - 4.1.3 Difference between brain death and coma ,
  - 4.1.4 Brain stem death and cardiac death,
  - 4.1.5 Steps of confirming and certifying brain death in Nepal,
  - 4.1.6 Physiological changes in brain dead patient and complications
  - 4.1.7 Medical management of potential organ donor,
  - 4.1.8 Legal aspects of brain-stem death in Nepal
  - 4.1.9 Records and Documentation

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- 4.2 Donation after Circulatory Death (DCD)
  - 4.2.1 Concept of DCD
  - 4.2.2 Deceased organ/ tissue donation and transplantation
  - 4.2.3 Importance and process of obtaining consent for organ donation and transplantation
  - 4.2.4 Process of handing over the body of the deceased donor
  - 4.2.5 Religious formalities and last rites
- 4.3 Multi organ retrieval
  - 4.3.1 Principles of donor management and organ preservation related to multi-organ retrieval surgical anatomy of multi-organ retrieval
  - 4.3.2 Donor-transmitted diseases
- 4.4 Liver, pancreatic and intestinal transplantation
  - 4.4.1 Liver, pancreas and intestine diseases that lead to the need of transplantation
  - 4.4.2 Indications and contraindications for liver, pancreas, and intestinal transplantation
- 4.5 Kidney transplantation
  - 4.5.1 Acute kidney disease and chronic kidney disease
  - 4.5.2 Indications and contraindications for kidney transplantation
  - 4.5.3 Immunosuppressive strategies used in kidney transplantation
- 4.6 Heart and lung transplantation
  - 4.6.1 Lung diseases that may require lung transplant.
  - 4.6.2 Heart and lung donation/transplantation
  - 4.6.3 Indications and contraindications of heart and lung transplantation

**5. Management (10 Marks)**

- 5.1 Management: - concept, principles, functions, scope, role, level and skills of managers
- 5.2 Conflict management: concept, approaches to conflict, levels of conflict, causes of conflict and strategies for conflict management
- 5.3 Leadership: concept, functions, leadership styles, leadership and management effectiveness.
- 5.4 Coordination: concept, need, types, techniques, and approaches of effective coordination
- 5.5 Communication: concept, communication process and barrier to effective communication, techniques for improving communication
- 5.6 Evaluation/ performance evaluation: concept, types, evaluation tools, methods/process, performance appraisal
- 5.7 Personnel Development: Motivation, Morale, Leadership and Decision Making.
- 5.8 In-service education: Planning, organizing, conducting, clinical teaching
- 5.9 Teaching and learning: methods and media
- 5.10 Health research: concept, types, design, research ethics, sampling, data collection methods, analysis and report writing
- 5.11 Supervision: Types and its usage in health sector

**6. Health management (5 Marks)**

- 6.1 Health management information system (HMIS)
- 6.2 Disaster Management
- 6.3 Quality Assurance Management

**Section B**

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Short Question	2 Question × 5 Marks = 10 Marks	<b>50 Marks</b>
Long Question	3 Question × 10 Marks = 40 Marks	

**7. Role of Transplant Coordinator (10 Marks)**

- 7.1 History and Current Practice
  - 7.1.1 History of Transplant Coordinator role development
  - 7.1.2 Role in the transplant team
  - 7.1.3 Challenges and limitations of the role
  - 7.1.4 Global differences in the role
- 7.2 Pre and Post-transplant counseling
  - 7.2.1 Steps of counseling
  - 7.2.2 Pre- requisites for counseling
  - 7.2.3 Assessment of level of understanding of the patients
  - 7.2.4 Important aspects in pre and post organ transplant counseling
  - 7.2.5 Counseling of the bereaving families for deceased organ donation
  - 7.2.6 Challenges in dealing with patients and families with chronic diseases and roles and responsibilities of a coordinator in their management
- 7.3 Evaluation and Management of the Transplant Candidate
  - 7.3.1 Indications/Contraindications for Transplantation
  - 7.3.2 Evaluation and management
  - 7.3.3 Elements of evaluation
  - 7.3.4 Tests
  - 7.3.5 Imaging
  - 7.3.6 Legal aspects
- 7.4 Patient and family education
- 7.5 Psychosocial issues: pre-transplant
  - 7.5.1 Substance abuse
  - 7.5.2 Support systems
  - 7.5.3 Financial assessment
- 7.6 Role of recipient transplant coordinator in living organ/ tissue donation and transplantation, best practices in organ retrieval, transportation, storage, and donation

**8. Immediate Post-Transplant Care (10 Marks)**

- 8.1 Immediate Post-Transplant Management
  - 8.1.1 ICU management
  - 8.1.2 Surgical and Medical Complications
  - 8.1.3 Prophylactic Regimen
  - 8.1.4 Immunosuppression therapy
- 8.2 Management of Acute Cellular Rejection and Antibody Mediated Rejection
  - 8.2.1 Definitions of acute cellular rejection and antibody mediated rejection
  - 8.2.2 Management strategies of acute cellular rejection
  - 8.2.3 Management strategies of antibody mediated (humoral) rejection
- 8.3 Post-operative Patient Education
  - 8.3.1 Medication teaching
  - 8.3.2 Signs and symptoms of infection and rejection
  - 8.3.3 Monitoring for infection, rejection and changes in medical status
  - 8.3.4 Follow up care post discharge

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- 8.4 Long Term Follow-up
  - 8.4.1 Follow up Surveillance program (include common complications diabetes, HTN, hypercholesterolemia)
  - 8.4.2 Current recommendations
  - 8.4.3 Role of the surveillance biopsy
  - 8.4.4 Non-transplant complications, frequencies, and treatment strategies
  - 8.4.5 Return to Work, School and Quality of Life
- 8.5 Infection and Malignancy
  - 8.5.1 Common infections and their timing in the post-transplant period
  - 8.5.2 Prevention and treatment of infections
  - 8.5.3 Malignancy Risk
  - 8.5.4 Prevention and treatment of malignancy
- 8.6 Chronic Rejection
  - 8.6.1 Signs and symptoms
  - 8.6.2 Current treatment strategies
  - 8.6.3 Re-transplantation

**9. Stress and crisis (5 Marks)**

- 9.1 Physiological and psychological responses to stress
- 9.2 Burnout syndrome
- 9.3 Modes of coping with stress
- 9.4 Stress management
- 9.5 Crisis
- 9.6 Concept of crisis
- 9.7 Types and characteristics of crisis
- 9.8 Crisis of separation and loss; stages of dying, loss, mourning and n grieving (DABDA)
- 9.9 Factors influencing the outcome of crisis
  - 9.9.1 The individual's perception of the problem or event
  - 9.9.2 Available situational support of Coping mechanisms
  - 9.9.3 Crisis resolution Techniques

**10. Intensive Care (5 Marks)**

- 10.1 Ventilator care
- 10.2 Advanced life support system
- 10.3 Maintenance of a brain death donor
- 10.4 Anesthetic care of Brain death donor
- 10.5 Pharmacotherapeutic agents

**11. Organ donation legislation in Nepal and Laws related to health (10 Marks)**

- 11.1 Medico-legal case
- 11.2 Disposal of dead body
- 11.3 Narcotic drugs
- 11.4 Relation to organ donor
- 11.5 Pair exchange
- 11.6 Brain death Organ Donation
  - 11.6.1 Brain death Declaration Criteria
  - 11.6.2 Organ allocation scoring system (Kidney)
  - 11.6.3 Criteria for Deceased Donor Liver Transplantation
  - 11.6.4 Criteria for Deceased Donor Heart/Lung Transplantation

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**12. Acts and Regulations (10 Marks)**

- 1.2 Human Organ Transplantation (Regulation and Prohibition) Act, 2055 with amendment.
- 1.3 Human Organ Transplantation Regulations, 2073
- 1.4 Guidelines on medical treatment of deprived citizens program, 2080
- 1.5 Human Organ Transplant Development Committee Personnel Administration Rules, 2069 (मानव अंग प्रत्यारोपण विकास समिति कर्मचारी प्रशासन नियमवाली, २०६९)
- 1.6 Human Organ Transplant Development Committee Formation Order, 2068 (मानव अंग प्रत्यारोपण विकास समिति गठन आदेश, २०६८)
- 1.7 General knowledge about Shahid Dharmabhakta National Transplant Center