

शहीद धर्मभक्त राष्ट्रिय प्रत्यारोपण केन्द्र
मानव अङ्ग प्रत्यारोपण विकास समिति, प्रविधिक सेवा, सर्जरी समूह, कार्डियोथोरासिक उपसमूह, आठौं तह,
सिनियर रजिष्ट्रार/रजिष्ट्रार (कार्डियोथोरासिक तथा भास्कूलर सर्जरी) 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	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 (CTVS Surgery)		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 :

- 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 ।
- 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 ।
- प्रथम र द्वितीय पत्रमा प्रत्येक खण्ड (Section) को लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन् । उम्मेदवारले प्रत्येक खण्ड (Section) को प्रश्नको उत्तर छुट्टाछुट्टै 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

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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
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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

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- 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 cytotoxicity (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

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- 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

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**Paper II: Technical subject
(CTVS Surgery)**

Section A

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

1. Basic Science (20 Marks)

- 1.1 Applied Anatomy and Developmental Anatomy of the chest wall Diaphragm, Pleura, Lungs, Mediastinum, Oesophagus, Heart, Pericardium, Great Vessel and its branches.
- 1.2 Applied Physiology – Respiration, gas exchange, Pulmonary function tests, ventilation, Cardiac cycle, Cardiac output, heart sounds and murmurs, regional circulation, Extracorporeal Circulation Hypothermia, cardiac metabolism, Acid base balance, Fluid Electrolyte Balance, Gastro Oesophageal reflux.
- 1.3 Applied Pathology- Thoracic injuries, Chest wall tumours, mediastinal tumours. Pleural diseases, disorders of Trachea, Bronchus & lung / Pulmonary suppuration, pulmonary tuberculosis, benign & malignant lesions of lungs, benign and malignant lesions of Oesophagus, strictures & motility disorders of Oesophagus, Diaphragmatic hernia, diseases of Heart and great vessels, pulmonary embolism
- 1.4 Applied Microbiology – pulmonary infections, infective endocarditis; infections following cardiac & thoracic surgery.
- 1.5 Pharmacology: Knowledge of medicines used in this specialty.
- 1.6 Cardiovascular Engineering: Concept of flow, pressure gradients, heart as a pump, efficiency of heart and valves, hemodynamic assessment, prosthetic and bioprosthetic heart valves, extra corporeal circulation, hypothermia, IABP, ECMO, Ventricular assist devices, materials in cardiovascular application and biocompatibility, pacemakers, defibrillation, Automated Implantable Cardioverter Defibrillator (AICD).
- 1.7 Imaging: X-Ray, USG, CT Scan, MRI, CT-Angio, PET. Nuclear Medicine, Perfusion scan

2. Cardio Thoracic and Vascular surgery (10 Marks)

- 2.1 Congenital cardiac surgery, Heart valve surgery, coronary artery bypass surgery, paediatric and neonatal cardiac surgery, Re- Do cardiac surgery.
- 2.2 General thoracic surgery - Surgery of chest wall Diaphragm, Mediastinum, trachea and bronchus, pleura and lungs, Oesophagus, chest trauma, neonatal cardio vascular thoracic emergencies.
- 2.3 Vascular surgery – Surgery of great vessel, peripheral vascular surgery, disease of veins – varicose veins, Deep Vein Thrombosis (DVT), vascular trauma.
- 2.4 Cardiothoracic Trauma: The assessment and management of patients with minor and major cardio-vascular & thoracic trauma.

3. Management of a Patient Undergoing Thoracic Surgery (10 Marks)

- 3.1 General Management of a Patient Undergoing Thoracic Surgery
 - 3.1.1 Patient selection and determination of suitability for major thoracic surgery and the pre- and post-operative management of a thoracic surgical patient

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- 3.1.2 The assessment and management of a patient by bronchoscopy including foreign body retrieval
- 3.1.3 The assessment and management of a patient by mediastinal exploration. Competence in performing appropriate thoracic incisions
- 3.2 Critical Care Medicine: The management of critically ill cardio-vascular & thoracic surgical patients in the pre and post-operative periods. Cardiac arrest, Cardiopulmonary and cardio cerebral resuscitation, Ventilators, cardiac monitors, Swan-Ganz catheter and cardiac output measurement, inotropes, renal failure and dialysis.
- 3.3 Cardiothoracic Anaesthesia - Anaesthesia techniques, single lung anaesthesia, Paediatric and neonatal cardiac anaesthesia, Perioperative analgesia and sedation, intra operative TEE
- 3.4 Cardiology: Noninvasive – ECG, Echocardiography, Invasive – Cardiac Cath and Angiography

4. Procedures (10 Marks)

- 4.1 Thoracic endoscopies –Bronchoscopy (Rigid and Fibre optic), Oesophagoscopy (Rigid and Fibre optic), Mediastinoscopy.
- 4.2 Detailed knowledge of Recent Advances in Cardiac Surgery – Heart Transplant. Lung Transplant. Myocardial revascularization, Laser surgery. Robotic surgery – Computer Aided Surgical Development – Genetic Engineering, Cardiac Disease Treatment, Cloning, etc.
- 4.3 Video assisted Thoracic Surgery - Principle, Indications, Techniques and Complications
- 4.4 Cardiopulmonary Bypass, Myocardial Protection and Circulatory Support
 - 4.4.1 The management of a patient undergoing cardiopulmonary bypass
 - 4.4.2 The management of myocardial protection during cardiac surgery
 - 4.4.3 The management of a patient requiring circulatory support
- 4.5 Dialysis access surgery
Principles of dialysis access surgery, Creation of AV fistula, management of AV fistula related complications, Use of vascular grafts and tunneled long term dialysis catheters

Section B

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

5. Diseases of Heart and great vessels (20 Marks)

- 5.1 Ischaemic Heart Disease
 - 5.1.1 The assessment and management of patients with coronary heart disease, including elective and emergency presentations
 - 5.1.2 Off pump and on pump strategies and arterial revascularization
 - 5.1.3 The preliminary assessment and initial management of patients with complications of myocardial infarction, including mitral regurgitation, aneurysm and septal defects
- 5.2 Heart Valve Disease
 - 5.2.1 The assessment and management of patients with valvular heart disease; including both isolated and combined aortic and mitral valve disease

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5.2.2 The assessment and management of patients with combined coronary and valvular heart disease, including operative management

5.3 Aortovascular Disease

5.3.1 The preliminary assessment and initial management of patients with acute dissection of the ascending aorta.

6. Disorders of the Chest Wall and Lung and neighboring structures (20 Marks)

6.1 Neoplasms of the Lung : The assessment and management of lung cancer, including the scientific basis of staging systems and techniques used in the determination of stage and fitness for surgery; Role of surgical treatment in the multidisciplinary management of lung cancer and other intrathoracic malignant diseases, including an appreciation of the principles of other treatment modalities and their outcomes

6.2 Disorders of the Pleura: The assessment and management of patients with pleural disease; including pneumothorax and empyema, and including both VATS and open strategies

6.3 Disorders of the Chest Wall: The assessment and management of patients with chest wall abnormalities, infections and tumors

6.4 Disorders of the Diaphragm: The assessment and management of patients' disorders of the diaphragm, including trauma to the diaphragm.

6.5 Emphysema and Bullae: The assessment and management of patients with emphysematous and bullous lung disease; including surgical management if appropriate and utilizing both VATS and open strategies

6.6 Disorders of the Pericardium: The assessment and management of patients with disorders of the pericardium and pericardial cavity; including surgical management if appropriate and utilising both VATS and open strategies

6.7 Disorders of the Mediastinum: The assessment and management of patients with mediastinal tumours and masses; including surgical management if appropriate and utilising both VATS and open strategies

6.8 Disorders of the Airway: The assessment and management of patients with disorders of the major airways including operative management in suitable cases

6.9 Vascular emergency: Principles of management of vascular emergencies, Thrombectomy and peripheral bypass

6.10 Vascular aneurysm: Principles of management of abdominal aortic aneurysm, Aneurysm surgery, endovascular interventional surgery for AAA, peripheral aneurysms

6.11 Peripheral arterial diseases: Diagnosis and management of peripheral arterial disease, open and endovascular management, Management of complications, Optimal medical therapy

7. Organs (Kidney, Liver, Pancreas and others) donation and transplantation (10 Marks)

7.1 Basic concept of organ donation and transplantation

7.2 Assessment and investigations of the donor and recipient undergoing heart and lung transplantation

7.3 Concept of immunology and commonly used drugs used in heart and lung transplantation with their side effects

7.4 Complications and their management in a Heart and Lung transplant recipient