

शहीद धर्मभक्त राष्ट्रिय प्रत्यारोपण केन्द्र
मानव अङ्ग प्रत्यारोपण विकास समिति, प्रविधिक सेवा, मेडिसिन समूह, कार्डियोलोजी उपसमूह, नवौं तह,
कन्सल्टेन्ट (कार्डियोलोजी) 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 (Cardiology)		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
(Cardiology)**

Section A - (Clinical Cardiology)

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

1. Basic Diseases and Management in Clinical Cardiology (20 Marks)

- 1.1 History taking and physical examination in cardiology
- 1.2 History, physical examination, diagnosis, management and prognosis of following cardiovascular diseases and conditions
 - 1.2.1 Coronary artery disease
 - 1.2.2 Systemic hypertension
 - 1.2.3 Rheumatic fever and rheumatic heart disease
 - 1.2.4 Congenital heart disease
 - 1.2.5 Pulmonary Thrombo-embolism and pulmonary arterial hypertension
 - 1.2.6 Cardiomyopathy
 - 1.2.7 Valvular Heart disease
 - 1.2.8 Tumors of heart
 - 1.2.9 Heart failure
 - 1.2.10 Arrhythmia
 - 1.2.11 Sudden cardiac death and cardiopulmonary resuscitation (CPR)
 - 1.2.12 Pericardial diseases
 - 1.2.13 Pregnancy in heart diseases

2. Epidemiology and advances of Cardiovascular diseases (10 Marks)

- 2.1 Epidemiology and worldwide burden of cardiovascular diseases
 - 2.1.1 Cardiovascular risk factors
 - 2.1.2 Primary and secondary prevention of coronary heart disease
- 2.2 Preventive Cardiology
- 2.3 Recent Advances in cardiology
- 2.4 Major recent and land marks studies and trials in cardiology

3. Non-invasive Cardiology and imaging (10 Marks)

- 3.1 Principles, technique, interpretation of Electrocardiogram (ECG)
- 3.2 Chest X-ray in cardiovascular disease
- 3.3 Principles, indication, technique, interpretation of Holter monitoring
- 3.4 Principles, indication, technique, interpretation of Ambulatory blood pressure monitoring
- 3.5 Techniques, exercise protocols, indication, contraindication, interpretation, limitations of Cardiac stress test
- 3.6 Cardiac CT: Indication, contraindication, interpretation, clinical application, use of CT coronary angiogram

4. Echocardiography (10 Marks)

- 4.1 General principles of Trans-thoracic echocardiography
- 4.2 Trans-esophageal echocardiography
- 4.3 Assessment and quantification of chambers
- 4.4 Assessment and quantification of vascular lesions
- 4.5 Assessment and quantification of LV/RV function
- 4.6 Tissue Doppler, strain imaging and speckle tracking
- 4.7 Contrast echocardiography
- 4.8 Assessment of myocardial ischemia and viability using echocardiography
- 4.9 Echocardiography in emergency room
- 4.10 Assessment of prosthetic valve by echocardiography

Section B - (Specialized Cardiology)

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

5. Invasive Cardiology (20 Marks)

- 5.1 Right and left heart catheterization: Indications, technique, interpretation
- 5.2 Coronary angiogram: Indication, contraindication, technique
- 5.3 Percutaneous Coronary Intervention: Principles, indication, technique
- 5.4 Different types of coronary stents and principles of use
- 5.5 Drug Eluting Ballon angioplasty : Principles, Indication, Techniques
- 5.6 Temporary pacemaker insertion: Indication, technique, complications
- 5.7 Pericardiocentesis: Indication, contraindication, technique
- 5.8 Intervention in structural and congenital heart diseases
- 5.9 Indication and Patient selection for Transcatheter aortic valve replacement (TAVR)
- 5.10 Radiation hazard and protection
- 5.11 Complications in cardiac cath lab and their management

6. Cardiology in Organs Transplantation (30 Marks)

- 6.1 Basic concept and Indications of organ donation and transplantation
- 6.2 Concept of organ retrieval and transplantation
- 6.3 Heart Transplantation: Indications, selection, procedure and complications
- 6.4 Essentials and Challenges for a successful heart transplant program
- 6.5 Cardiology assessment and relevant cardiac investigations of the donor and recipient undergoing Kidney transplantation
- 6.6 Cardiology assessment and relevant cardiac investigations of the donor and recipient undergoing Liver transplantation
- 6.7 Perioperative cardiac complications and their management in transplant recipients
- 6.8 Coronary artery disease and its management considerations in patients undergoing kidney transplantation

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6.9 Coronary Artery disease and its management considerations in Patients undergoing Liver Transplantation

6.10 Cardiac care in other organ transplantation

6.11 Transplant Pharmacology

6.11.1 Immunosuppressants

6.11.2 Antimicrobial agent (Antibiotic, Antiviral, Antifungal, Antiprotozoal)