

**पाटन स्वास्थ्य विज्ञान प्रतिष्ठान सेवा आयोग**  
**प्राज्ञिक सेवा, इन्टर्नल मेडिसिन समूह, Cardiology उपसमूह सहायक प्राध्यापक पद, नौ ख (९ ख) तहको खुला र**  
**आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम**

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	Part I: Management, General Health Issues, Academic Research and Teaching-Learning Practices	50	100	40	10 × 5 = 50 (Subjective)	2.15 hrs
		Part II: Technical Subject (Relevant Subject)	50			(Objective Multiple Choice) 50 × 1 = 50	
II	Technical Subject (Relevant Subject)		100	40	7 × 10 = 70 (Long answer) 2 × 15 = 30 (Critical Analysis)	3.00 hrs	
<b>द्वितीय चरण (Second Phase)</b>							
	Interview		30		Oral		

**द्रष्टव्य :**

- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुन सक्नेछ ।
- प्रतिष्ठानको प्राज्ञिक सेवा अन्तर्गतका सबै समूह/सबै उपसमूहहरूको लागि प्रथमपत्रको Part I को पाठ्यक्रमको विषयवस्तु एउटै हुनेछ । तर प्रथम पत्रको Part II र द्वितीयपत्र Technical Subject को पाठ्यक्रम समूह/उपसमूह अनुरूप फरक फरक हुनेछ ।
- प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ । प्रथम पत्रको Part II र द्वितीय पत्रको विषयवस्तु एउटै समूहको हकमा समान हुनेछ । 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 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 प्रश्नमा प्रत्येक पत्र/विषयका प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन् । परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरूको उत्तर सोही खण्डका उत्तरपुस्तिकामा लेख्नुपर्नेछ ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भएतापनि पाठ्यक्रममा परेका कानून, ऐन, नियम, विनियम तथा नीतिहरू परीक्षाको मितिभन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्भन्नु पर्दछ ।
- प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।
११. पाठ्यक्रम लागू मिति : २०७८/१०/१७

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**Paper I: General Subject**

**Part I:**

**(Management, General Health Issues, Academic Research and Teaching - Learning Practices)**

**Section (A) - 25 Marks**

**1. Management**

- 1.1. Health care management system in Nepal and other parts of the world
- 1.2. Fundamental principles of healthcare institution and hospital management.
- 1.3. Effective hospital management principles
- 1.4. Purpose of medical and non-medical data and records
- 1.5. Ethics and responsibility of management
- 1.6. Concept of management and its application in health care including hospital
  - 1.7.1 Management: Concept, principles, functions, scope and role, level and skills of manager
  - 1.7.2 Planning: Concept, principles, nature, types, instruments and steps
  - 1.7.3 Leadership: Concept, function, leadership styles, leadership and management
  - 1.7.4 Coordination: Concept, types, techniques of effective coordination
  - 1.7.5 Communication and counselling: Concept, communication processes and barrier to effective communication, techniques for improving communication
  - 1.7.6 Decision making: Importance, types, rational process of decision making, problem solving techniques, improving decision making
  - 1.7.7 Participative management: Concept, advantage and disadvantage, techniques of participation
  - 1.7.8 Time management: Concept, essential factors and strategies for effective time management
  - 1.7.9 Conflict management: Concept, approaches to conflict, levels of conflict, causes of conflict and strategies for conflict management
  - 1.7.10 Stress management: Concept, causes and sources of stress, techniques of stress management
  - 1.7.11 Change management: Concept, sources of organizational change, resistance to change, management of resistance to change
  - 1.7.12 Appreciative inquiry: Concept, basic principle and management
  - 1.7.13 Human resource management: Concept, functions and different aspects
  - 1.7.14 Health manpower recruitment and development
  - 1.7.15 Financial management: Concept, approaches, budget formulation and implementation, Auditing and topics related to fiscal administration

**2. General Health Issues**

- 2.1. Present constitution of federal republic of Nepal (including health and welfare issues)
- 2.2. Organizational structure of Ministry of Health at national/federal, regional/state, district (if applicable), municipal and village council level
- 2.3. Professional council and related regulations
- 2.4. National Health Policy
- 2.5. Health Service Act and Regulation
- 2.6. Second Long term health plan
- 2.7. Health Management Information System, forms, indicators, annual reports
- 2.8. Human Development Indices, Sustainable Development Goals
- 2.9. Health volunteers in the national health system, its rationale, use and effectiveness

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- 2.10. Local governance and community participation in health service delivery
- 2.11. Health Insurance and financing in health care
- 2.12. Alternative health care system: Ayurveda, homeopathy, Unani, Chinese etc.
- 2.13. Indigenous and traditional faith health and health practices
- 2.14. International Health Agencies: Roles and responsibilities of WHO, UNICEF, UNFPA, Inter-agency relationships, Government-agency coordination: Joint Annual Review meeting
- 2.15. Supervision, types and its usage in health sector
- 2.16. Monitoring and evaluation system in health sector
- 2.17. National Health Training Centre
- 2.18. National and International Disaster Plan, Coordination
- 2.19. Patan Academy of Health Sciences Act, Mission, Goals, Organogram
- 2.20. Scope and function of Patan Academy of Health Sciences executive bodies (senate, executive committee, academic council, faculty board, hospital management committee, subject committee), various other committees

**Section (B) - 25 Marks**

**3. Academic Research**

- 3.1 Ethics, Bio-ethics and Professionalism
- 3.2 Human dignity and Human Right
- 3.3 Benefit and Harm
- 3.4 Autonomy and Individual responsibility
- 3.5 Consent and capacity to consent
- 3.6 Privacy and confidentiality
- 3.7 Respect for humans and personal integrity
- 3.8 Non-discrimination and non-stigmatization
- 3.9 Respect for cultural diversity and pluralism
- 3.10 National Health Research Council (NHRC) and its guidelines
- 3.11 Research process: ethical research proposal development, research principles, methods and materials, conclusion/recommendation/lesson learnt, commonly used referencing styles
- 3.12 IRB/IRC forms, types, use, importance; getting IRB/IRC clearance
- 3.13 Ethics on research methodology: sample selection, sample size calculation, ensuring reliability and validity of the instruments as well as methods proposed for health research
- 3.14 Quantitative and Qualitative studies
- 3.15 Data analysis (data visualization, descriptive statistics, inferential statistics with statistical hypotheses and appropriate tools/methods for quantitative studies; theme and code generation, thematic analysis, content analysis, grounded theory for qualitative and triangulation for mixed method studies)
- 3.16 Research ethics on vulnerable and non-vulnerable population
- 3.17 Research proposal/protocol/publication:
- 3.18 Publication ethics, plagiarism including self-plagiarism

**4. Teaching - Learning, Assessment and Evaluation**

- 4.1 Lancet Commission Report on Education of Health Professionals
- 4.2 Adult learning: Theories, principles, use, importance and outcomes, Andragogy vs. Pedagogy

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- 4.3 Conventional teaching - learning: Didactic lectures, Teacher centred approaches, use and importance
- 4.4 Surface learning, deep learning and metacognition
- 4.5 Integrated teaching: Genesis, use, importance and outcomes
- 4.6 Problem-based learning: Genesis, use, importance and outcomes
- 4.7 SPICES model its use, importance and outcomes
- 4.8 Socialization, self-directed learning, mentoring, role model
- 4.9 Community orientation/community posting, re-orientation of medical education camp, community based learning and community engaged teaching-learning methods/models, use, importance and outcomes
- 4.10 Outcome Based Education (Competency-based Medical/Health Professions Education): Genesis, use, importance and outcomes
- 4.11 Experiential learning, Reflective practice, Feedback and feed-forward, Situated learning, Co-operative learning, Communities of practice
- 4.12 Assessment of students
  - 4.12.1 Blueprinting (Table and specification) : use, importance and outcomes
  - 4.12.2 Bloom's taxonomy of cognitive, psychomotor and affective domains, use and importance
  - 4.12.3 Diagnostic, Formative, Summative and Professional exams
- 4.13 Assessment of knowledge: Selection methods like Multiple Choice Questions, Extended Matching Items and supply methods like Short Answer Question, Problem Based Question, Long Answer Question with or without model answers and marking schemes, unstructured, semi-structured and structured viva-voce examination, advantages and limitations, use and importance, outcomes and its use in quality control
- 4.14 Assessment of performance (in-vitro): Direct observation of skills in the simulated setting, lab, ward etc. with or without checklist, Objective Structured Practical Examination, Objective Structured Clinical Examination, Standardized patients, use and importance, analysis, quality assurance, outcomes and its use in quality control
- 4.15 Assessment of performance (in-vivo): Mini-Clinical Evaluation Exercise (Mini-CEX), Direct Observation of Procedural Skills (DOPS), Case-Based Discussion (CbD), OSATS/ PBA, Multi-Source feedback (360 degree evaluation) use and importance for competency based health professions education, analysis, quality assurance, outcomes and its use in quality control
- 4.16 Assessment of observable behaviours in small groups e.g. Problem Based Learning sessions, Community Based Learning and Education sessions, Clinical clerkship rotations
- 4.17 Evaluation: Difference between assessment and evaluation, theory of change and its use in health professions education, process and outcome evaluation, qualitative, quantitative and mixed methods used in evaluation of health professions education

**Paper I**

**Part II: Technical Subject**

**Section (C) - 25 Marks**

1. **Clinical Cardiology:** Etiopathology, hemodynamic, clinical evaluation, non-invasive and invasive evaluation and management strategies for the following disorders:
  - 1.1 **Coronary artery disease**  
Coronary Blood Flow and Myocardial Ischemia, Approach to the Patient with Chest Pain, Classification of myocardial infarction, ST-Elevation Myocardial Infarction: Pathology, Pathophysiology, and Clinical Features, ST-Elevation Myocardial Infarction: Management, Primary Percutaneous Coronary Intervention in the Management of Acute Myocardial Infarction, Unstable Angina and Non-ST Elevation Myocardial Infarction, Chronic Coronary Artery Disease
  - 1.2 **Rheumatic heart disease**  
Rheumatic Fever, Rheumatic Diseases and the Cardiovascular System
  - 1.3 **Congenital heart disease**  
Aortic Valve Stenosis (AVS), Atrial Septal Defect (ASD), Coarctation of the Aorta (CoA), Complete Atrioventricular Canal defect (CAVC), d-Transposition of the Great Arteries, Ebstein's Anomaly, Hypoplastic Left Heart Syndrome, I-Transposition of the Great Arteries, Patent Ductus Arteriosus (PDA), Pulmonary Atresia, Pulmonary Valve Stenosis, Single Ventricle Defects, Tetralogy of Fallot, Total Anomalous Pulmonary Venous Connection (TAPVC), Tricuspid Atresia, Truncus Arteriosus, Ventricular Septal Defect (VSD)
  - 1.4 **Pericardial diseases**  
Pericarditis, pericardial effusion, cardiac tamponade, and constrictive pericarditis
  - 1.5 **Cardiac arrhythmias**  
Genesis of Cardiac Arrhythmias: Electrophysiological Considerations, Diagnosis of Cardiac Arrhythmias, Therapy for Cardiac Arrhythmias, Cardiac Pacemakers and Cardioverter-Defibrillators, Specific Arrhythmias: Diagnosis and Treatment, Cardiac Arrest and Sudden Cardiac Death, Hypotension and Syncope.
  - 1.6 **Valvular Heart Disease**  
Aortic valve stenosis, Aortic regurgitation, Mitral valve stenosis, Mitral regurgitation, Tricuspid valve stenosis, Tricuspid regurgitation, Pulmonary valve stenosis and Pulmonary regurgitation
  - 1.7 **Heart failure**  
Mechanisms of Cardiac Contraction and Relaxation, Pathophysiology of Heart Failure, Clinical assessment, Classification of heart failure, Acute Heart Failure, Systolic Heart Failure, Heart Failure w/Preserved Systolic Fx, Surgical management of Heart Failure, Assisted Circulation in the treatment of Heart Failure, Emerging therapies for Heart Failure, Care of Patients with End-Stage Heart Disease.

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**1.8 Systemic diseases involving a heart**

- Diabetes Mellitus, Thiamine deficiency, Hyperthyroidism, Hypothyroidism, Malignant carcinoid, Pheochromocytoma, Acromegaly, HIV, Amyloidosis, Sarcoidosis, Hemochromatosis, Marfan syndrome, Ehlers-Danlos syndrome
- Rheumatic disorders & cardiovascular diseases (RA, SLE, SpA, psoriatic arthritis etc)
- Neurological disorders & cardiovascular diseases
- Renal disorders & cardiovascular diseases
- Cancer patient & cardiovascular diseases
- Cardiovascular manifestations of autonomic disorders
- Infections & heart (Infective endocarditis, HIV & others)
- Toxins & heart

**1.9 Heart muscle diseases**

Classification of heart muscle disease, Dilated cardiomyopathy (DCM), Hypertrophic cardiomyopathy (HCM), Restrictive cardiomyopathy (RCM), Left Ventricular Non-compaction (LVNC), Arrhythmogenic Right Ventricular Dysplasia (ARVD), Stress-related cardiomyopathy

**1.10 Traumatic heart disease**

**1.11 Tumours of heart**

**Section (D) - 25 Marks**

2. **Clinical Cardiology:** Etiopathology, hemodynamic, clinical evaluation, non-invasive and invasive evaluation and management strategies for the following disorders:

**2.1 Peripheral vascular disorders**

**2.2 Pulmonary thromboembolism and pulmonary hypertension**

**2.3 Systemic hypertension**

**2.4 Genetics, molecular biology and immunology related to cardiology**

Molecular Biology, Genomics and Proteomics in Cardiovascular Disease, Genetics and Cardiovascular Disease, Genetics of Cardiac Arrhythmias, Genetics of Myocardial Disease

**2.5 Geriatric heart disease**

**2.6 General anaesthesia and non-cardiac surgery in patients with heart disease**

**2.7 Pregnancy and heart disease**

**2.8 Epidemiology and preventive cardiology**

The Vascular Biology of Atherosclerotic disorders and Cardiovascular Disease, The Metabolic Syndrome, Diabetes Mellitus, and Atherosclerotic Vascular Disease, Nutrition and Cardiovascular Disease, Primary and Secondary Prevention of Coronary

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Heart Disease, Comprehensive Rehabilitation of Patients with Cardiovascular Disease,  
Complementary and Alternative Approaches to Management

3. **Non-invasive Technique:** To perform and interpret various non-invasive techniques including:
  - 3.1 Electrocardiography
  - 3.2 Radiography-routine and specialized areas like CT and MRI
  - 3.3 Stress testing-tread mill test, stress-related and other nuclear techniques
  - 3.4 Holter monitoring for arrhythmias and ischemic disorders
  - 3.5 Echocardiography-M-mode, two dimensional, Doppler, colour flow imaging, transoesophageal echocardiography and echo directed hemodynamic studies
4. **Invasive Cardiology**
  - 4.1 Experience in cardiac catheterization to calculate and interpret various hemodynamic parameters
  - 4.2 Right and left heart Cath and coronary angiography procedures in adults and children
  - 4.3 To perform temporary pacemaker insertion
  - 4.4 To assist in various interventions including valvuloplasty, coronary and congenital interventions
  - 4.5 Electrophysiology: To interpret electrophysiological data and assist in electrophysiology procedures, permanent pacemaker implantation