



मनमोहन प्राविधिक विश्वविद्यालय  
सेवा आयोग

शिक्षण सेवा, आर्किटेक्चरल इन्जिनियरिङ समुह, छैठौं तहको असिस्टेण्ट लेक्चरर पदको  
आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

**पदको विवरण**

सेवा : शिक्षण	समूह : आर्किटेक्चरल इन्जिनियरिङ
पद : असिस्टेण्ट लेक्चरर	तह : छैठौं

**पाठ्यक्रमको रूपरेखा**

यस पाठ्यक्रमको आधारमा निम्नानुसार दुई चरणमा परीक्षा लिइनेछ ।

प्रथम चरण : लिखित परीक्षा

पूर्णाङ्क : ६०

द्वितीय चरण : (क) प्रयोगात्मक परीक्षा

पूर्णाङ्क : ४०

(ख) अन्तर्वार्ता

पूर्णाङ्क : २५

**तालिका (१)**

प्रथम चरण : लिखित परीक्षा

पत्र	विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	प्रश्न संख्या	समय
प्रथम	खण्ड (क) सेवासम्बन्धी कानुनी व्यवस्था	२०	२४	वस्तुगत बहुवैकल्पिक प्रश्न	७ प्रश्न X १ अङ्क = ७	२० मिनेट
	खण्ड (ख) सेवासम्बन्धी विषय			वस्तुगत बहुवैकल्पिक प्रश्न	१३ प्रश्न X १ अङ्क = १३	
द्वितीय	सेवासम्बन्धी विषय	४०		विषयगत प्रश्न	८ प्रश्न X ५ अंक = ४०	१ घण्टा ४० मिनेट

**तालिका (२)**

द्वितीय चरण : प्रयोगात्मक परीक्षा र अन्तर्वार्ता

विषय	पूर्णाङ्क	परीक्षा प्रणाली	समय
प्रयोगात्मक	४०	प्रयोगात्मक	१ घण्टा ३० मिनेट
अन्तर्वार्ता	२५	मौखिक	

**द्रष्टव्य :**

१. यो पाठ्यक्रमको योजनालाई प्रथम चरण र द्वितीय चरण गरी दुई भागमा विभाजन गरिएको छ ।
२. माथि उल्लेखित सेवा/समूह, तह र पदको खुला/आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम उपर्युक्तबमोजिम हुनेछ ।
३. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।
४. वस्तुगत बहुवैकल्पिक प्रश्नहरूको गलत उत्तर दिएमा प्रत्येक गलत उत्तरवापत सही उत्तर दिँदा पाउने अंकको २० प्रतिशत अङ्क कट्टा गरिनेछ । तर उत्तर नदिएमा अङ्क कट्टा गरिने छैन ।
५. वस्तुगत बहुउत्तर हुने परीक्षामा परीक्षार्थीले चार वटा उत्तरमध्ये एउटा मात्र उत्तरको नम्बर लेख्नुपर्नेछ ।
६. विषयगत प्रश्नका हकमा तोकिएको अंकका लागि एउटा प्रश्न वा एउटै प्रश्नका दुई वा दुईभन्दा बढी भाग वा दुई वा बढी प्रश्नहरू सोध्न सकिनेछ ।
७. परीक्षामा सोधिने प्रश्नसंख्या, अंक र अङ्कभार सम्बन्धित पत्र /विषयमा दिइएअनुसार हुनेछ ।
८. परीक्षामा परीक्षार्थीले मोबाइल, प्रोग्रामेबल क्यालकुलेटर, स्मार्ट-वाच वा यस्तै प्रकारका विद्युतीय उपकरण परीक्षा हलमा लैजान पाइने छैन ।
९. प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।
१०. प्रथम चरणको लिखित परीक्षामा छनौट भएका उम्मेदवारहरूको प्राप्तङ्क र द्वितीय चरणको प्रयोगात्मक परीक्षा तथा अन्तर्वार्ताको अंकको कूल योगका आधारमा अन्तिम परीक्षाफल प्रकाशित गरिनेछ ।
११. प्रथम र द्वितीय पत्रको परीक्षा एकै दिन हुनेछ । प्रथम पत्रको परीक्षाको उत्तरपुस्तिका बुझाउने बित्तिकै द्वितीय पत्रको परीक्षा सुरु हुनेछ ।
१२. यो पाठ्यक्रम मिति: २०७९/१०/०९ देखि लागु हुनेछ ।

**लिखित परीक्षाका विषयवस्तु**

**प्रथमपत्र**

- खण्ड (क): सेवासम्बन्धी कानुनी व्यवस्था (बहुवैकल्पिक प्रश्न) ७X १ = ७
- (क) नेपालको संविधान (भाग १, ३, ५ र अनुसूचीहरू)
- (ख) मनमोहन प्राविधिक विश्वविद्यालय ऐन २०७६
- (ग) मनमोहन प्राविधिक विश्वविद्यालय शिक्षक तथा कर्मचारी सेवाका सर्त र सुविधासम्बन्धी नियमावली, २०७८
- (घ) मनमोहन प्राविधिक विश्वविद्यालय आर्थिक प्रशासनसम्बन्धी नियमावली, २०७८
- (ङ) मनमोहन प्राविधिक विश्वविद्यालय सेवा आयोगसम्बन्धी नियमावली, २०७८
- (च) मनमोहन प्राविधिक विश्वविद्यालय संरक्षण समितिसम्बन्धी नियमावली, २०७८
- (छ) मनमोहन प्राविधिक विश्वविद्यालय शैक्षिक प्रशासनसम्बन्धी नियमावली, २०७८
- (ज) भ्रष्टचार निवारण ऐन, २०५९ (परिच्छेद २ कसूर र सजायसम्बन्धी व्यवस्था)
- (झ) नेपाल इञ्जिनियरिङ्ग परिषद् ऐन २०५५ तथा नियमावली, २०५७

खण्ड (ख): सेवासम्बन्धी (बहुवैकल्पिक प्रश्न)

१३X१ = १३

द्वितीयपत्रको सेवासम्बन्धी विषयको पाठ्यक्रम नै पहिलो पत्रको खण्ड “ख” को पाठ्यक्रम हुनेछ ।

## Model Questions

### Multiple choice questions (each question carries 1 marks)

1. When the projectors are parallel to each other and also perpendicular to the plane, the projection is called .....
  - a) Perspective projection
  - b) Oblique projection
  - c) Isometric projection
  - d) Orthographic projection
  
2. If a right angled triangle is made to revolute about one of its perpendicular sides the solid formed is .....
  - a) cube
  - b) triangular prism
  - c) cone
  - d) cylinder
  
3. Perspective projection is known as ....., Where Picture plane is inclined to both Ground plane and object.
  - a) One point perspective
  - b) Two points perspective
  - b) Three points perspective
  - c) Four points perspective.

द्वितीयपत्र: सेवासम्बन्धी विषय

पूर्णाङ्कः ४०

### 1. Engineering Drawing and Working Drawing

5

- 1.1 Orthographic projection: Orthographic projection of geometrical solid, ie. Prism, Cylinder and cone in simple Position.( simple position means axis-perpendicular to one plane and parallel to other, Axis parallel to both planes.
- 1.2 Pictorial Projection: Axonometric projection, and Isometric Drawing and Section
- 1.3 Projection of True length and shape of oblique line and shape, Projection of intersection of line and plane, Intersection plane and plane, points and line on the surface of geometrical solids, intersection between line and geometrical solids.
- 1.4 Importance and Role of working drawing; Necessary of details drawing.

### 2. Surveying

5

- 2.1 Principles of surveying; Difference between plan and map; Scales, their types and use; Conventional symbols. Linear Distance Measurement: Methods of distance measurement on horizontal and sloping ground; Tape correction;

Principles of chain surveying; Perpendicular offsets, Oblique offsets, Setting out.

2.2 Compass Survey: Meridians, Bearings, Magnetic declination, Whole circle bearing system, Quadrantal bearing system, Fore bearing and Back bearing; Calculation of angles from bearing and bearing from angles; Local attraction, detection and correction of local attraction; Errors in compass survey.

2.3 Leveling: Principles of leveling; Technical terms; Methods for booking and reducing of level; Fly leveling; Profile leveling and Cross sectioning; Reciprocal leveling; Errors in leveling and adjustment in closed circuit. Contouring: Contour interval, Horizontal equivalent, Index contour; Characteristics of contours; Uses of contour maps; Methods of interpolation of contours

### **3. Building Services**

5

3.1 Water supply and public health; Water cycle; Sources of water; Appurtenances; Water requirement standards; Design period; Population forecasting; Storage and distribution of water supply in the building and pipes used: Types of pipe used for distribution; Distribution of cold water and hot water in plumbing system; Rain water harvesting.

3.2 Disposal of solid waste and sanitary sewage: Waste pipe; One pipe system fully vented; Two pipe system fully vented; Single stack system; Drainage system; manhole, grease trap, septic tank, soak pit.

3.3 Electric circuit; Open and short circuits; Series and parallel circuits; Resistance; Electric supply system; Single and three phase A.C. circuits; Transformer; Artificial lighting system. Terms used in lighting system; Laws of illumination; Various types of light sources; Design of lighting sources; Lumen intensity different occupancies; Methods of lighting calculation; Street and flood lighting; Electrical safety and protection; Fuses, MCB and MCCB, Earthing; Electric wiring; General rules of wiring; Types of wiring system; Determination of light and power sub-circuits; Determination of size of cables

### **4. Building Design**

10

4.1 Program Formulation: Overall introduction of Building Design and assessment of need requirement of the Project.

4.2 Importance of anthropometry analysis in Conceptual Design & circulation, movements and functional spaces and functional relation between activities; inter-relationship of spaces with the help of bubble diagrams. For example: Preparation of reception, office, class rooms, laboratory, library, multipurpose

hall, teachers' room recreation room and toilets plans and any other necessary areas etc.

- 4.3 Micro – climate: Sun, wind, rain, humidity, precipitation; Openings – doors & windows for light, cross ventilation & thermal comfort. Site with SWOT analysis, (Physical, Biological, Culture analysis, and Visual analysis)
- 4.4 Preparation of Conceptual Floor Plan(s) and Site Plan: Considering proper living spaces and service, circulation and linking spaces like corridor and staircase with indoor and outdoor spaces
- 4.5 Consideration of Cultural, Social and Traditional Values in Building Design as style and evolution of form in preparation of plans, elevations and sections development.
- 4.6 Way of transformation of conceptual into finalization drawing: Floor Plan and functional & efficient uses of spaces. Final Development of Sections & Elevations
- 4.7 Technology – Availability of materials and appropriateness of construction method. Structure type massive or skeletal system (Load Bearing and RCC Framed structures)

## **5. Building Materials and Building Construction**

5

- 5.1 Different types of bricks stones and their uses in Architectural and engineering works; Artificial stones and their properties.
- 5.2 Lime: Sources; Types and uses; Types of Cement; Composition of cement (OPC); Properties and types; Storage of cement
- 5.3 Classification of sand and Aggregates, their uses and test; Mortars: Types of mortar (mud, lime, cement); Properties & uses of different types of mortar
- 5.4 Cement concrete: Workability & W/C ratio; Placing, compaction & curing of concrete; PCC & RCC.
- 5.5 Foundation (Substructure): Definition, purpose and function; Methods of improving bearing capacity of soil, Soil investigation (test pit); Loading on foundation; Simple spread foundation; Types of shallow foundation; Foundation in Weak soil; Special foundation for weak soils; Foundation for black cotton soil; Raft foundation.
- 5.6 Wall: Solid load bearing wall - Construction Methods; Features (Lintels, sills, jambs, their functions and construction techniques); Damp proofing materials & their application in buildings; Damp proofing methods; Special walls - Definition & types; Cavity wall; Partition wall; Curtain wall; Elements,

construction detail of cavity, partition and curtain wall; Floors: Solid ground floor & suspended floor; Flooring materials.

5.7 Roof: Timber Roofs: Single Roof; Lean to Roof and double lean to roof; Collar and couple roof; elements and functions of single roof; Skylight (roof light): Definition, Functions, elements and construction details; Double roof; Triple or framed roof (Trussed roof); Steel roof (Trussed roof); Tubular; Angle; Elements functions, construction methods & detail

5.8 Doors and windows: Timber door, Window & ventilation; Metal door, window & ventilation (steel/Aluminum).

## **6. Elementary Structure**

5

6.1 Basic Principles of Force; Coplanar and non-coplanar forces; Concurrent and non-concurrent forces; Parallel forces; Varignon's theorem; Concept of couple and moment. Composition and components of forces; Geometrical Properties of Simple Sections: Centroid of an area; Moment of area; Moment of inertia; Centroid and Moment of inertia of compound sections.

6.2 Types of structural members (beams, columns, trusses, frames)

6.3 Simple Stress and strain: Types of stress (direct, shear, bending, torsion); Hooke's law; Stress - strain diagrams; Ultimate strength, factor of safety and working stress. Shear Force and Bending Moment; Types of determinate beams; Determination of beam reaction; Shear force and bending moment; Sign convention of shear force and bending moment; Calculation of axial force, shear force and bending moment in a beam with different loading; Drawing of axial force, shear force and bending moment diagrams of beams

6.4 Reinforced Concrete: Properties of plain concrete and Reinforced concrete; Difference between working stress method and Limit state method; Reinforced Sections: Behavior of a RC beam under loading; singly reinforced beam; doubly reinforced beams, T beams and L beams; Shear stress; Bond strength and development length.

6.5 Slabs, column and beam: Design of one way rectangular slab; Short and long column; Design formula for a short column; Design of short rectangular column

## **7. Curriculum Overview**

5

Curriculum Overview: Preparation of teaching plan, Lesson plan and Session plan.

## विषय : प्रयोगात्मक परीक्षा

समय : १ घण्टा ३० मिनेट

पूर्णाङ्क : ४०

उत्तीर्णाङ्क : १६

प्रयोगात्मक परीक्षा अन्तर्गत सेवा सम्बन्धी विषयमा उल्लेखित विषयवस्तु मध्ये तोकिएको इकाईबाट एउटा पाठ शिक्षण गर्न दिइनेछ । प्रत्येक उम्मेद्वारको लागि फरक फरक इकाई तोक्नु पर्नेछ । उम्मेद्वारले शिक्षण गर्दा स्लाईड तयार गरि पावरपईन्टबाट प्रस्तुतिकरण गर्नु पर्नेछ । प्रयोगात्मक कार्यको मुल्याङ्कन देहाय वमोजिम गरिनेछ ।

क	कक्षा सञ्चालन सम्बन्धी पाठ योजना तयारी	(५)
ख	विषयवस्तु प्रस्तुतीकरण	(३०)
	१ विषयवस्तुको ज्ञान	(१०)
	२ शिक्षण विधीको प्रयोग	(१०)
	३ कक्षाको वातावरण	(५)
	४ समय व्यवस्थापन	(५)
ग	सिकाइ मुल्याङ्कन	(५)

जम्मा: ४०

## Model Questions

Short Answer questions (each question carries 5 marks)

1. What is different between in 1<sup>st</sup> angle projection and 3<sup>rd</sup> angle projection?  
Explain with figures. (3+2)
2. Why composition is very important in Architectural presentation techniques? (5)
3. Form ever follows the function, Justify. (5)

☆☆☆