त्रिभुवन विश्वविद्यालय
सेवा आयोग

प्राविधिक सेवा, प्राविधिक समूह, सहायक प्रथम, मुख्य प्राविधिक सहायक (इन्जिनियरिङ्ग) पदको खुला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम
२०८१

लिखित परीक्षा योजना

लिखित परीक्षा : **कुल पूर्णाङ्क :** १००

पत्र/विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	प्रश्न संख्या × अङ्क	समय
प्रथम	१००	४०	वस्तुगत - बहुवैकल्पिक प्रश्न (MCQs)	५० प्रश्न × १ अङ्क	४५ मिनेट
			विषयगत प्रश्न	१० प्रश्न × ५ अङ्क	१ घण्टा १५ मिनेट

द्रष्टव्य :

1. लिखित परीक्षाको लागि १०० पूर्णाङ्कको एक पत्र हुनेछ ।
2. वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नको विकल्प छनौट गर्दा गलत विकल्प छानेमा ऋणात्मक मूल्याङ्कन (Negative Marking) गरिने छ । अर्थात् यसरी मूल्याङ्कन गर्दा प्रत्येक गलत उत्तरको लागि २० प्रतिशत अङ्ककट्टा गरिनेछ। बहुवैकल्पिक प्रश्नको २० प्रतिशत अङ्क प्राप्ताङ्कबाट घटाइने छ। (उदाहरणका लागि परीक्षार्थीले २० अङ्कको बहुबैकल्पिक प्रश्नमा १५ प्रश्नको सही उत्तर र ५ प्रश्नको गलत उत्तर दिएमा निजको प्राप्ताङ्क (०.२० × ५=१.००) अर्थात् १५–१= १४ अङ्क हुनेछ। तर उत्तर नदिएमा त्यस बापत अङ्क दिइने छैन र अङ्क कट्टा पनि गरिने छैन ।
3. विषयगत प्रश्नको 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 ।
4. विषयगत प्रश्नमा प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन्। उम्मेदवारले प्रत्येक खण्डका प्रश्नको उत्तर सोही खण्डका उत्तरपुस्तिकामा लेख्नुपर्नेछ ।
5. प्रत्येक पत्रको उत्तीर्णाङ्क पूर्णाङ्कको ४० प्रतिशत हुनेछ ।
6. भाषा विषयबाहेक अन्य विषयका लागि उत्तरको माध्यम अंग्रेजी वा नेपाली हुनेछ ।

1. **Surveying and Engineering Drawing**
   - 1.1 Basic principle of surveying
   - 1.2 Survey tools and equipment
   - 1.3 Linear distance measurement
   - 1.4 Chain Survey
   - 1.5 Abney level survey
   - 1.6 Compass survey and compass traversing
   - 1.7 Plane table surveying
   - 1.8 Levelling (level Survey)
   - 1.9 Theodolite surveying and theodolite traversing
   - 1.10 Tachometric surveying
   - 1.11 Contouring and their properties
   - 1.12 Area volume measurement
   - 1.13 Setting out: small buildings, simple circular curves
   - 1.14 Engineering drawing : concept, aims, used and importance of drawing; drawing tools and instruments and their uses; drafting techniques and methods in common practice; introduction to Computer Aided Drafting (CAD) software

2. **Construction Materials and Concrete Technology**
   - 2.1 Stone: formation and availability of stones in Nepal, methods of laying and construction with various stones
   - 2.2 Cement: types, composition, properties, uses, specifications and various tests
   - 2.3 Bricks and aggregates: classification, properties and selection criteria
   - 2.4 Paints and varnishes: type and selection, preparation techniques, use
   - 2.5 Bitumen: type, selection, use
   - 2.6 Timber and timer product and propertied
   - 2.7 Metal and alloys
   - 2.8 Constituents and properties of concrete (physical and chemical); various tests, water cement ratio; basic admixtures; high strength concrete; pre-stressed concrete technology

3. **Basic Hydraulic**
   - 3.1 Fluid and its properties
   - 3.2 Pressure depth relationship and Pascal's Law
   - 3.3 Measurement of pressure by different kinds of manometers
   - 3.4 Buoyancy and Archimedes principle
   - 3.5 Continuity and Bernoulli Equations and their applications
   - 3.6 Pipe flow, head loss calculations
   - 3.7 Open channel flow and channel properties
   - 3.8 Manning's and Chezy's formulas
   - 3.9 Energy and momentum principle and application
   - 3.10 Flow measurement

4. **Building Construction**
   4.1 Building and their type
   4.2 Foundation adopted for buildings
   4.3 Masonry wall, stone masonry
   4.4 Partition and cavity walls
   4.5 Concrete construction
   4.6 Formwork and scaffolding
   4.7 Floor and their types
   4.8 Roof, staircase and differ parts of buildings
   4.9 Door and windows
   4.10 Finishing works

5. **Mechanics of Structure and Structural Design**
   5.1 Forces on a rigid body
   5.2 Stress and strains, theory of tension and flexure, friction moment of inertia, centre of gravity
   5.3 Analysis of plane truss
   5.4 One-way, two-way slabs and their design criteria
   5.5 Analysis of beams and frames: bending moment and shear force
   5.6 Steel structures and joints
   5.7 Roof truss
   5.8 Timber structures
   5.9 Shear and bonds for RCC
   5.10 Axial load in column
   5.11 Introduction to limit state method

6. **Soil Mechanics, Transportation Engineering and Water Supply**
   6.1 Classification and properties of soil
   6.2 Compaction and consolidation of soil
   6.3 Shear strength and earth pressure
   6.4 Bearing capacities of soil
   6.5 Road classification in Nepal
   6.6 Highway alignment and engineering survey
   6.7 Geometric design of highway
   6.8 Highway drainage system
   6.9 Highway pavement, surface and sub-surface
   6.10 Highway maintenance and hill road
   6.11 Bridges and trail bridges and their development in Nepal
   6.12 Water supply : objectives of water supply system, source of water and its selection, importance of drainage system and requirements of a good drainage system

7. **Estimating, Costing and Valuation**
   7.1 Types of estimate and their procedure, units of estimation

7.2 Quantity of estimate
7.3 Estimating of various components of buildings, foundation, roads
7.4 Rate analysis and different engineering works
7.5 Bill of quantities, specification and its type and procedure
7.6 Valuation its purpose and methods

8. **Construction Management**
8.1 Organization: need for organization, responsibilities of a junior engineer, relation between owner, contractor and engineer
8.2 Site management: preparation of site plan, organizing labor, measures to improve labor efficiency, accident prevention
8.3 Contract procedure: contracts, departmental works and day-work, types of contracts, tender and tender notice, earnest money and security deposit, preparation before inviting tender, agreement, conditions of contract and construction supervision
8.4 Accounts: administrative approval and technical sanction, familiarity with standard account keeping formats used in governmental organizations, measurement book, running bill, final bill, and project completion report
8.5 Planning and control: construction schedule, equipment and materials schedule, construction stages and operations, bar chart, CPM and PERT
8.6 Safety measures and programs in excavation, drilling, blasting, tower erection, cable stringing and underground works

9. **त्रि.वि ऐन र नियम सम्बन्धी सामान्य जानकारी**
9.1 त्रि.वि ऐन, २०४९
9.2 त्रि.वि शिक्षक, कर्मचारी सेवा सम्बन्धी नियम, २०५०

त्रिभुवन विश्वविद्यालय
सेवा आयोग

प्राविधिक सेवा, प्राविधिक समूह, सहायक प्रथम, मुख्य प्राविधिक सहायक (इन्जिनियरिङ्ग) पदको खुला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

(Specification Chart)

२०८१

वस्तुगत - बहुवैकल्पिक प्रश्न

खण्ड	एकाई	विषय शीर्षक	अङ्क	प्रश्न संख्या	प्रश्न संख्या × अङ्क भार
	1.	Surveying and Engineering Drawing	8	50	50 प्रश्न × 1 अङ्क
	2.	Construction Materials and Concrete Technology	6		
	3.	Basic Hydraulic	5		
	4.	Building Construction	5		
	5.	Mechanics of Structure and Structural Design	5		
	6.	Soil Mechanics, Transportation Engineering and Water Supply	6		
	7.	Estimating, Costing and Valuation	5		
	8.	Construction Management	5		
	9.	त्रि.वि ऐन र नियम सम्बन्धी सामान्य जानकारी	5		
कुल जम्मा			50	50	

विषयगत प्रश्न

खण्ड	एकाई	विषय शीर्षक	अङ्क	प्रश्न संख्या	प्रश्न संख्या × अङ्क भार
	1.	Surveying and Engineering Drawing	5	1	10 प्रश्न × 5 अङ्क
	2.	Construction Materials and Concrete Technology	5	1	
	3.	Basic Hydraulic	5	1	
	4.	Building Construction	5	1	
	5.	Mechanics of Structure and Structural Design	5	1	
	6.	Soil Mechanics, Transportation Engineering and Water Supply	5	1	
	7.	Estimating, Costing and Valuation	5	1	
	8.	Construction Management	10	2	
	9.	त्रि.वि ऐन र नियम सम्बन्धी सामान्य जानकारी	5	1	
कुल जम्मा			50	10	