त्रिभुवन विश्वविद्यालय
सेवा आयोग

प्राविधिक सेवा, प्राविधिक समूह सहायक द्वितीय श्रेणी, प्राविधिक सहायक (इन्जिनियरिङ्ग) पदको खुला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम
२०८१

लिखित परीक्षा योजना

लिखित परीक्षा : **कुल पूर्णाङ्क :** १००

पत्र/विषय	प''र्णाङ्क	उत्तीर्णाङ्क	परीषा प्रणाली	प्रश्न संख्या × अङ्क	समय
प्रथम	१००	४०	वस्तुगत - बहुवैकल्पिक प्रश्न (MCQs)	५० प्रश्न × १ अङ्क	५० मिनेट
			विषयगत प्रश्न	१० प्रश्न × ५ अङ्क	१ घण्टा ४५ मिनेट

द्रष्टव्य :

1. लिखित परीक्षाका 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 । बहुबैकल्पिक 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. प्रत्येक पत्रको उत्तीर्णाङ्क पूर्णाङ्कको ४० प्रतिशत हुनेछ ।
5. भाषा विषयबाहेक अन्य विषयका लागि उत्तरको माध्यम अंग्रेजी वा नेपाली हुनेछ ।

1. Knowledge on Construction Materials

1.1 Type of construction materials available in different part of Nepal.

1.2 Properties of construction materials: physical, chemical, constituents, thermal etc.

1.3 Stone: Types, characteristics and requirements of stones as building materials. Required tests to confirm their strength and durability.

1.4 Brick: Types, properties of good bricks and requirements of bricks as building materials. Required tests to confirm their strength and durability.

1.5 Ceramic materials: Ceramic tiles, mosaic tiles, their uses and tests to confirm strength and durability.

1.6 Cementing materials: Types and properties of lime and cement. Constituents of lime and cement mortars, their uses and required tests to confirm their strength and durability.

1.7 Metals: Steel; types and properties; alloys their uses and tests. Aluminum, its properties, uses and tests.

1.8 Timber and wood: Different timber trees in Nepal, types and properties of wood, their uses and necessary tests.

1.9 Miscellaneous materials: Asphaltic materials (Asphalt, Bitumen and Tar); paints and varnishes; polymers; composites, etc.

2. Concrete Technology

2.1 Constituents and properties of concrete (physical and chemical)

2.2 Water cement ratio, its importance

2.3 Grade and strength of concrete, concrete mix design, testing of concrete

2.4 High strength concrete: Ingredients, preparation, importance and uses.

2.5 Mixing, transportation pouring and curing of concrete

2.6 Admixtures and construction chemicals

2.7 Special concrete and concreting methods

2.8 Elasticity, creep and shrinkage of concrete

2.9 Durability of concrete

2.10 Pre-stressed concrete technology

3. Drawing in Engineering

3.1 Drawing sheet, its size, composition and essential components

3.2 Suitable scales, selection of scales, site plans, preliminary drawings, working drawings etc

3.3 Theory of projection drawing: perspective, orthographic and axonometric projection; first and third angle projection

3.4 Handling of drafting tools, equipments

3.5 Drafting conventions and symbols

3.6 Topographic, electrical, plumbing, sewage and structural drawings

3.7 Techniques of free hand drawing and importance of

3.8 Drawings

4. Engineering Survey

4.1 Introduction, importance and basic principles of surveying

4.2 Linear measurements: techniques; chain, tape, ranging rods and arrows; representation of measurement and common scales; sources of errors; effect of slope and slope correction; correction for chain and tape measurements; Abney level and clinometers

4.3 Compass and plane table surveying: bearings; types of compass; problems and sources of errors of compass survey; principles and methods of plane tabling

4.4 Leveling and contouring: Principle of leveling; temporary and permanent adjustment of level; bench marks; booking methods and their reductions; longitudinal and cross sectioning; reciprocal leveling; trigonometric leveling; contour interval and characteristics of contours; methods of contouring

4.5 Theodolite traversing: Need of traverse and its significance; computation of coordinates; adjustment of closed traverse; closing errors

4.6 Uses of Total Station and Electronic Distance Measuring Instruments

4.7 Importance of GIS in surveying

5. Soil Mechanics

5.1 Properties of soil

5.2 Factors influencing the choice of foundation

5.3 Soil compaction, effective stress and compressibility of soils.

5.4 Shear strength of soils and slope stability

5.5 Lateral earth pressure in soils

5.6 Bearing capacity and settlement of foundations

5.7 Design of isolated footings, combined footings and raft foundations

6. Structural Analysis and Design

6.1 Stresses and strains; centre of gravity; moment of inertia; bending moment, shear force; deflection of beams and frames; theory of flexure, torsion and analysis for buckling of compression members.

6.2 Determinate Structures: Basic theorems, energy and other methods of obtaining the deflection of structures; analysis of beams, frames, trusses, cables and three hinged systems. Use of influence line diagrams for determinate structures.

6.3 Indeterminate Structures: Use of Castigliano's theorem to analyze indeterminate structures, flexibility and stiffness matrix methods; slope deflection method, moment distribution method. Use of influence line diagrams for indeterminate structures.

6.4 Reinforced concrete structures: Difference between working stress and limit state philosophy, analysis of RC beams and slabs in bending, shear, deflection, bond and end anchorage. Design of axially loaded columns, introduction to pre-stressed and post tensioned concrete.

6.5 Steel and timber structures: Structural properties of steel, standard and built-up sections: Design of riveted, bolted and welded connections, design of simple elements such as ties, struts, axially loaded and eccentric columns, column bases, properties of timber, design principles on timber beams and columns.

6.6 Masonry Structures: Materials, units and masonry strength, tests on units and masonry, failure mechanism of masonry structures due to vertical and horizontal loads. Design of masonry structures for vertical and lateral loads.

७. त्रि.वि.ऐन र नियम सम्बन्धी सामान्य जानकारी

७.१ त्रि.वि ऐन, २०४९

७.२ त्रि.वि शिक्षक कर्मचारी सेवा सम्बन्धी नियम, २०५०

त्रिभुवन विश्वविद्यालय
सेवा आयोग

प्राविधिक सेवा, प्राविधिक समूह, सहायक द्वितीय श्रेणी, प्राविधिक सहायक (इलेक्ट्रिसिटी) पदको खुला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

(Specification Chart)

२०८१

वस्तुगत - बहुवैकल्पिक प्रश्न

खण्ड	एकाई	विषय शीर्षक	अङ्क	प्रश्न संख्या	प्रश्न संख्या × अङ्क भार
	1.	Knowledge on Construction Materials	10	50	50 प्रश्न × 1 अङ्क
	2.	Concrete Technology	5		
	3.	Drawing in Engineering	5		
	4.	Engineering Survey	10		
	5.	Soil Mechanics	5		
	6.	Structural Analysis and Design	10		
	7.	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.	Knowledge on Construction Materials	10	10	4 प्रश्न × 5 अङ्क 3 प्रश्न × 10 अङ्क
	2.	Concrete Technology	5		
	3.	Drawing in Engineering	5		
	4.	Engineering Survey	10		
	5.	Soil Mechanics	5		
	6.	Structural Analysis and Design	10		
	7.	त्रि.वि.ऐन र नियम सम्बन्धी सामान्य जानकारी	5		
कुल जम्मा			50	10	