प्रदेश सरकार

भौतिक पूर्वाधार विकास मन्त्रालय

गण्डकी प्रदेश पोखरा

भौतिक पूर्वाधार विकास मन्त्रालय र मातहतका निकायहरुमा रिक्त रहेको स्थायी दरवन्दीका प्राविधिक पदमा पदपूर्ति नभएसम्मका लागि "सेवा करारमा प्राविधिक जनशक्ति छनौट सम्बन्धि कार्यविधि २०७६" बमोजिम प्रकाशित सूचना अनुसार **अधिकृतस्तर सातौ तह, ईन्जिनियर/ईन्जिनियर(वि. एण्ड आर.)** पदको लागि निर्धारित पाठ्यक्रम।

पाठ्यक्रमको रुपरेखाः- यस पाठ्यक्रमको आधारमा निम्नानुसार दुई चरणमा परीक्षा लिइने छ।

प्रथम चरणः- लिखित परीक्षा — पूर्णाङ्कः- १००

द्वितीय चरणः- अन्तर्वार्ता — पूर्णाङ्कः- ३०

प्रथम चरण- लिखित परीक्षा योजना (Examination Schedule)

विषय	पूर्णाङ्क	उत्तिर्णाङ्क	परीक्षा प्रणाली	प्रश्न संख्या x अङ्कभार	समय
सिभिल ईञ्जिनियरिङ्ग सम्बन्धी	१००	४०	वस्तुगत बहुबैकल्पिक (MCQs)	१००x१=१००	१ घण्टा १५ मिनेट

द्वितीय चरणः- अन्तर्वार्ता

विषय	पूर्णाङ्क	परीक्षा प्रणाली	समय
सिभिल ईञ्जिनियरिङ्ग सम्बन्धी	३०	मौखिक	

<u>द्रष्टव्यः</u>

१. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुन सक्नेछ ।

२. पाठ्यक्रमका एकाईहरुबाट सोधिने प्रश्नहरुको संख्या निम्नानुसार हुनेछ ।

एकाई	१	२	३	४	५	६	७	८	९
प्रश्न संख्या	२०	१५	१२	१२	१०	१०	८	८	५

३. वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरुको 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 ।

४. बहुवैकल्पिक प्रश्नहरु हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।

५. यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भए तापनि पाठ्यक्रममा परेका कानून, ऐन, नियम तथा नीतिहरु परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्क्रममा परेको सम्झनु पर्दछ ।

लोक सेवा आयोग

नेपाल इञ्जिनियरिङ्ग सेवा, सिभिल समूह, एयरपोर्ट, बिल्डिङ्ग एण्ड आर्किटेक्ट, जनरल, हाइवे, हाइड्रोपावर, इरिगेशन र स्यानिटरी उपसमूहको राजपत्राङ्कित तृतीय श्रेणीका पदहरुको खुला र आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

प्रथम पत्र :– सिभिल इञ्जिनियरिङ्ग सम्वन्धी विषय

1. Structure Analysis and Design 20%

1.1 Stresses and strains; theory of torsion and flexure; moment of inertia

1.2 Analysis of beams and frames: Bending moment, shear force and deflection of beams and frames: determinate structure - Energy methods; three hinged systems, indeterminate structures- slope deflection method and moment distribution method; use of influence line diagrams for simple beams, unit load method

1.3 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; isolated and combined footings, introduction to pre-stressed concrete

1.4 Steel and timber structures: 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, Design principles on timber beams and columns

2. Construction Materials 15%

2.1 Properties of building materials: physical, chemical, constituents, thermal etc.

2.2 Stones-characteristics and requirements of stones as a building materials

2.3 Ceramic materials: ceramic tiles, Mosaic Tile, brick types and testing etc.

2.4 Cementing materials: types and properties of lime and cement; cement mortar tests

2.5 Metals: Steel; types and properties; Alloys

2.6 Timber and wood: timber trees in Nepal, types and properties of wood

2.7 Miscellaneous materials: Asphaltic materials (Asphalt, Bitumen and Tar); paints and varnishes; polymers

2.8 Soil properties and its parameters

3. Concrete Technology 12%

3.1 Constituents and properties of concrete (physical and chemical)

3.2 Water cement ratio

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

3.4 Mixing, transportation pouring and curing of concrete

3.5 Admixtures

3.6 High strength concrete

3.7 Pre-stressed concrete technology

4. Construction Management 12%

4.1 Construction scheduling and planning: network techniques (CPM, PERT) and bar charts

4.2 Contractual procedure and management: types of contract, tender and tender notice, preparation of bidding (tender) document, contractors pre-qualification, evaluation of tenders and selection of contractor, contract acceptance, condition of contract; quotation and direct order, classifications of contractors; dispute resolution; muster roll

4.3 Material management: procurement procedures and materials handling

4.4 Cost control and quality control

4.5 Project maintenance

4.6 Occupational health and safety

4.7 Project monitoring and evaluation
4.8 Quality assurance plan
4.9 Variation, alteration and omissions

5. Estimating and Costing Valuation and Specification 10%

5.1 Types of estimates and their specific uses
5.2 Methods of calculating quantities
5.3 Key components of estimating norms and rate analysis
5.4 Preparation of bill of quantities
5.5 Purpose, types and importance of specification
5.6 Purpose, principles and methods of valuation

6. Drawing Techniques 10%

6.1 Drawing sheet composition and its essential components
6.2 Suitable scales, site plans, preliminary drawings, working drawings etc
6.3 Theory of projection drawing: perspective, orthographic and axonometric projection; first and third angle projection
6.4 Drafting tools and equipments
6.5 Drafting conventions and symbols
6.6 Topographic, electrical, plumbing and structural drawings
6.7 Techniques of free hand drawing

7. Engineering Survey 8%

7.1 Introduction and basic principles
7.2 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
7.3 Compass and plane table surveying: bearings; types of compass; problems and sources of errors of compass survey; principles and methods of plane tabling
7.4 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
7.5 Theodolite traversing: need of traverse and its significance; computation of coordinates; adjustment of closed traverse; closing errors
7.6 Uses of Total Station and Electronic Distance Measuring Instruments

8. Engineering Economics 8%

8.1 Benefit cost analysis, cost classification, sensitivity analysis, internal rate of return, time value of money; economic equilibrium, demand, supply and production, net present value, financial and economic evaluation

9. Professional Practices 5%

9.1 Ethics and professionalism: code of conduct and guidelines for professional engineering practices
9.2 Nepal Engineering Council Act, 2055 and regulations, 2056
9.3 Relation with clients, contractor and fellow professionals
9.4 Public procurement practices for works, goods and services and its importance

लोक सेवा आयोग

नेपाल इञ्जिनियरिङ्ग सेवा, सिभिल समूह, एयरपोर्ट, बिल्डिङ्ग एण्ड आर्किटेक्ट, जनरल, हाइवे, हाइड्रोपावर, इरिगेशन र स्यानिटरी उपसमूहको राजपत्राङ्कित तृतीय श्रेणीका पदहरुको खुला र आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

वस्तुगत बहुउत्तर नमूना प्रश्नहरु (Sample questions)

1. The most reliable estimate is
   (A) Detailed estimate
   (B) Preliminary estimate
   (C) Plinth area estimate
   (D) Cube rate estimate **Correct Answer:- (A)**
2. The first stage of construction project is
   (A) Preparation of estimate
   (B) Survey of the site
   (C) Preparation of tender
   (D) Initiation of planning **Correct Answer:- (D)**
3. Slump test of concrete is a measure of its
   (A) Consistency
   (B) Compressive strength
   (C) Tensile strength
   (D) Impact value **Correct Answer:- (A)**
4. Internal rate of return (IRR) is one of the indicators of an investment project and is used for the selection of it. The project is financially acceptable
   (A) If the IRR is greater than the borrowing rate
   (B) If the IRR is less than the borrowing rate
   (C) If the IRR is equal to the borrowing rate
   (D) Without calculating the IRR **Correct Answer:- (A)**
5. The back staff reading on a Bench Mark (B.M.) of reduced level 500.00m is 2.685m. If foresight reading on a point is 1.345m the reduced level of the point is
   (A) 502.685m
   (B) 501.345m
   (C) 501.340m
   (D) 504.030m **Correct Answer:- (C)**
6. An under reinforced section means
   (A) Steel is provided at the under side only
   (B) Steel provided is insufficiently
   (C) Steel is provided on one face only
   (D) Steel will yield First **Correct Answer:- (D)**
7. Nepal Engineering Council is an autonomous body formed under NEC act.....
   (A) 2053
   (B) 2054
   (C) 2055
   (D) 2056 **Correct Answer:- (C)**
8. The strength of a stone depends on
   (A) Chemical composition
   (B) Degree of packing of constituents
   (C) Structure of rock
   (D) All of the above **Correct Answer:- (D)**
9. Lacing in steel structures are provided
   (A) to reduce the slenderness ratio of a long strut
   (B) for connecting together two or more sections
   (C) through out the length of strut as far as practicable
   (D) all of the above **Correct Answer:- (D)**