

लोक सेवा आयोग
नेपाल इन्जिनियरिङ्ग सेवा, सिभिल समूह, एयरपोर्ट, बिल्डिङ्ग एण्ड आर्किटेक्ट, जनरल, हाइवे, हाइड्रोपावर,
इरिगेशन र स्यानिटरी उपसमूहको राजपत्राङ्कित तृतीय श्रेणीका पदहरूको खुला र आन्तरिक प्रतियोगितात्मक
लिखित परीक्षाको पाठ्यक्रम
प्रथम पत्र :- सिभिल इन्जिनियरिङ्ग सम्बन्धी 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

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- 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