यस पाठ्यक्रमलाई दुई भागमा विभाजन गरिएको छ।

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<th>विषय</th>
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<th>परीक्षा प्रणाली</th>
<th>उत्तराङ्क</th>
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१. लिखित परीक्षामा यथासम्भव पाठ्यक्रमको सबै एकाइहरुबाट प्रश्नहरू सोधिनेछ।
२. वस्तुगत बहुउत्तर (Multiple Choice) प्रश्नहरूको उत्तर सही दिएमा प्रत्येक सही उत्तर वापस २ (दुई) अङ्क प्रदान गरिएको भने गलत उत्तर दिएमा प्रत्येक गलत उत्तर वापस २० प्रतिशत अर्थात ०.४ अङ्क केही गरिएको। तर उत्तर नदिएमा त्यस वापस अङ्क दिइने छैन र अङ्क केही पाँच गरिइने छैन।
३. यस पाठ्यक्रममा जसै सुची लेखिएको भएता पति पाठ्यक्रममा परेका ऐन, नियमहरू परीक्षाको मिलि भन्दा ३ (तीन) महिना आगाडि संशोधन भएका वा संशोधन भई हटाइएका वा भए गरी संशोधन भई। कायम रहेका छ यस पाठ्यक्रममा रहेको सम्भनु पर्दछ।
४. लिखित परीक्षामा २० नौटेल भएका उमेदवारहरुलाई मात्र अन्तर्वांतामा सम्भैली गराइएको।
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      1.1.2 Principle of surveying
      1.1.3 Selection of suitable method
      1.1.4 Scales, plans and maps
      1.1.5 Entry into survey field books and level books
   1.2 Levelling
      1.2.1 Methods of levelling
      1.2.2 Levelling instruments and accessories
      1.2.3 Principles of levelling
   1.3 Plane Tabling
      1.3.1 Equipments required
      1.3.2 Methods of plane tabling
      1.3.3 Two and three point problems
   1.4 Theodolite and Traverse surveying
      1.4.1 Basic difference between different theodolites
      1.4.2 Temporary adjustments of theodolites
      1.4.3 Fundamental lines and desired relations
      1.4.4 Tacheometry: stadia method
      1.4.5 Trigonometrical levelling
      1.4.6 Checks in closed traverse
   1.5 Contouring
      1.5.1 Characteristics of contour lines
      1.5.2 Method of locating contours
      1.5.3 Contour plotting
   1.6 Setting Out
      1.6.1 Small buildings
      1.6.2 Simple curves

2. **Construction Materials**
   2.1 Stone
      2.1.1 Formation and availability of stones in Nepal
      2.1.2 Methods of laying and construction with various stones
   2.2 Cement
      2.2.1 Different cements: Ingredients, properties and manufacture
      2.2.2 Storage and transport
      2.2.3 Admixtures
   2.3 Clay and Clay Products
      2.3.1 Brick: type, manufacture, laying, bonds
   2.4 Paints and Varnishes
      2.4.1 Type and selection
      2.4.2 Preparation techniques
      2.4.3 Use
2.5 Bitumen
2.5.1 Type
2.5.2 Selection
2.5.3 Use

3. Mechanics of Materials and Structures
3.1 Mechanics of Materials
3.1.1 Internal effects of loading
3.1.2 Ultimate strength and working stress of materials
3.2 Mechanics of Beams
3.2.1 Relation between shear force and bending moment
3.2.2 Thrust, shear and bending moment diagrams for statically determinate beams under various types of loading
3.3 Simple Strut Theory

4. Hydraulics
4.1 General
4.1.1 Properties of fluid: mass, weight, specific weight, density, specific volume, specific gravity, viscosity
4.1.2 Pressure and Pascal's law
4.2 Hydro-Kinematics and Hydro-Dynamics
4.2.1 Energy of flowing liquid: elevation energy, Kinetic energy, potential energy, internal energy
4.3 Measurement of Discharge
4.3.1 Weirs and notches
4.3.2 Discharge formulas
4.4 Flows
4.4.1 Characteristics of pipe flow and open channel flow

5. Soil Mechanics
5.1 General
5.1.1 Soil types and classification
5.1.2 Three phase system of soil
5.1.3 Unit Weight of soil mass: bulk density, saturated density, submerged density and dry density
5.1.4 Interrelationship between specific gravity, void ratio, porosity, degree of saturation, percentage of air voids air content and density index
5.2 Soil Water Relation
5.2.1 Terzaghi's principle of effective stress
5.2.2 Darcy's law
5.2.3 Factors affecting permeability
5.3 Compaction of soil
5.3.1 Factors affecting soil compaction
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5.3.3 Relation between dry density and moisture content

5.4 Shear Strength of Soils
  5.4.1 Mohr-Coulomb failure theory
  5.4.2 Cohesion and angle of internal friction

5.5 Earth Pressures
  5.5.1 Active and passive earth pressures
  5.5.2 Lateral earth pressure theory
  5.5.3 Rankine's earth pressure theory

5.6 Foundation Engineering
  5.6.1 Terzaghi's general bearing capacity formulas and their application

6. Structural Design
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    6.1.1 Under reinforced, over reinforced and balanced sections
    6.1.2 Analysis of single and double reinforced rectangular sections
  6.2 Shear and Bond for R.C. Sections
    6.2.1 Shear resistance of a R.C. section
    6.2.2 Types of Shear reinforcement and their design
    6.2.3 Determination of anchorage length
  6.3 Axially Loaded R.C. Columns
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    6.3.2 Design of a rectangular column section
  6.4 Design and Drafting of R.C. Structures
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7. Building Construction Technology
  7.1 Foundations
    7.1.1 Subsoil exploration
    7.1.2 Type and suitability of different foundations: Shallow, deep
    7.1.3 Shoring and dewatering
    7.1.4 Design of simple brick or stone masonry foundations
  7.2 Walls
    7.2.1 Type of walls and their functions
    7.2.2 Choosing wall thickness, Height to length relation
    7.2.3 Use of scaffolding
  7.3 Damp Proofing
    7.3.1 Source of Dampness
    7.3.2 Remedial measures to prevent dampness
  7.4 Concrete Technology
    7.4.1 Constituents of cement concrete
    7.4.2 Grading of aggregates
    7.4.3 Concrete mixes
7.4.4 Water cement ratio
7.4.5 Factors affecting strength of concrete
7.4.6 Form work
7.4.7 Curing

7.5 Wood work
7.5.1 Frame and shutters of door and window
7.5.2 Timber construction of upper floors
7.5.3 Design and construction of stairs

7.6 Flooring and Finishing
7.6.1 Floor finishes: brick, concrete, flagstone
7.6.2 Plastering

8. Water Supply and Sanitation Engineering

8.1 General
8.1.1 Objectives of water supply system
8.1.2 Source of water and its selection: gravity and artisan springs, shallow and deep wells; infiltration galleries.

8.2 Gravity Water Supply System
8.2.1 Design period
8.2.2 Determination of daily water demand
8.2.3 Determination of storage tank capacity
8.2.4 Selection of pipe
8.2.5 Pipe line design and hydraulic grade line

8.3 Design of Sewer
8.3.1 Quantity of sanitary sewage
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8.4 Excreta Disposal and Unsewered Area
8.4.1 Pit latrine
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9. Irrigation Engineering

9.1 General
9.1.1 Advantages and Disadvantages of irrigation

9.2 Water Requirement
9.2.1 Crop season and principal crops
9.2.2 Base period

9.3 Flow irrigation Canals
9.3.1 Canal losses and their minimization
9.3.2 Maximum and minimum velocities
9.3.3 Design of irrigation canal section based on manning's formula
9.3.4 Need and location of spillways
9.3.5 Head works for small canals
10. **Highway Engineering**
   10.1 General
       10.1.1 Introduction to transportation systems
       10.1.2 Historic development of roads
       10.1.3 Classification of road in Nepal
       10.1.4 Basic requirements of road alignment
   10.2 Geometric Design
       10.2.1 Basic design control and criteria for design
       10.2.2 Elements of cross section, typical cross-section for all roads in filling and cutting
       10.2.3 Camber
       10.2.4 Determination of radius of horizontal curves
       10.2.5 Superlevation
       10.2.6 Sight distances
       10.2.7 Gradient
       10.2.8 Use of Nepal Road Standard, 2027 (First Revision 2045) and subsequent revision in road design
   10.3 Drainage System
       10.3.1 Importance of drainage system and requirements of a good drainage system
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       10.4.1 Pavement structure and its components: subgrade, sub-base, base and surface courses
   10.5 Road Machineries
       10.5.1 Earth moving and compacting machines
   10.6 Road Construction Technology
   10.7 Bridge
       10.7.1 T-beam bridge
       10.7.2 Timber bridges
   10.8 Road Maintenance and Repair
       10.8.1 Type of maintenance Works
   10.9 Tracks and Trails

11. **Estimating and Costing**
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       11.1.1 Main items of work
       11.1.2 Units of measurement and payment of various items of work and material
       11.1.3 Standard estimate formats of government offices
   11.2 Rate Analysis
       11.2.1 Basic general knowledge on the use of rate analysis
norms prepared by Ministry of Works and Transport and the district rates prescribed by district development committee

11.3 Specifications
11.3.1 Interpretation of specifications

11.4 Valuation
11.4.1 Methods of valuation
11.4.2 Basic general knowledge of standard formats used by commercial banks and NIDC for valuation

12. Construction Management

12.1 Organization
12.1.1 Need for organization
12.1.2 Responsibilities of a civil overseer
12.1.3 Relation between Owner, Contractor and Engineer

12.2 Site Management
12.2.1 Preparation of site plan
12.2.2 Organizing labor
12.2.3 Measures to improve labor efficiency
12.2.4 Accident prevention

12.3 Contract Procedure
12.3.1 Contracts
12.3.2 Departmental works and day-work
12.3.3 Types of contracts
12.3.4 Tender and tender notice
12.3.5 Earnest money and security deposit
12.3.6 Preparation before inviting tender
12.3.7 Agreement
12.3.8 Conditions of contract
12.3.9 Construction supervision

12.4 Accounts
12.4.1 Administrative approval and technical sanction
12.4.2 Familiarity with standard account keeping formats used in governmental organizations
12.4.3 Muster roll
12.4.4 Completion report

12.5 Planning and Control
12.5.1 Construction schedule
12.5.2 Equipment and materials schedule
12.5.3 Construction stages and operations
12.5.4 Bar chart
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13.1 General
- 13.1.1 Introduction to Air Transport System
- 13.1.2 Historic development of Airports in Nepal
- 13.1.3 Classification of Airports
- 13.1.4 Airport terminologies

13.2 Design
- 13.2.1 Basic design control and criteria for design
- 13.2.2 General items contained in ANNEX 14 (ICAO Publication)
- 13.2.3 Planning of Airport and its elements
- 13.2.4 Terminal Building and Control Tower
- 13.2.5 Drainage System
- 13.2.6 Geometric design, pavement structure and its component
- 13.2.7 Basic knowledge of Heliport and Hangers

13.3 Airport Maintenance
- 13.3.1 Types of maintenance
- 13.3.2 Methods of maintenance

14. **स्थानीय निकायको प्रशासन**

1. स्थानीय स्वायत्त शासन ऐन, २०५५
2. स्थानीय स्वायत्त शासन नियमावली, २०५६