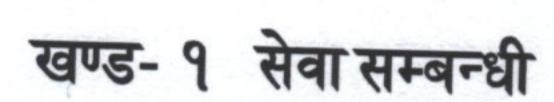


## (दफा ७(२) सँग सम्बन्धित

## प्राविधिक सहायकको पाठ्यक्रम



## क) प्रशासन सम्बन्धी -१० अंक

समयः १ घण्टा

- प्रधानमन्त्री रोजगार कार्यक्रम संचालन निर्देशिका, २०७५, कामका लागि पारिश्रमिकमा आधारित सामूदायिक आयोजना सञ्चालन तथा व्यवस्थापन कार्यविधी, २०७६ र युवा रोजगारीका लागि रुपान्तरण पहल आयोजना (संचालन तथा व्यवस्थापन) कार्यबिधि, २०७६,
- कामका लागि पारिश्रमिक (Cash for Work) को अवधारणा,
- सामाजिक परिचालन, सार्वजनिक सुनुवाई, सामाजिक लेखापरीक्षण तथा गुनासो व्यवस्थापन,
- ४. स्थानीय तहको बजेट तर्जुमा प्रकृया, खर्च व्यवस्थापन र लेखा परीक्षण,
- आचरण तथा अनुशासन र सुशासन।

#### ख) प्राविधिक कार्य सम्बन्धी परीक्षा-४० अंक

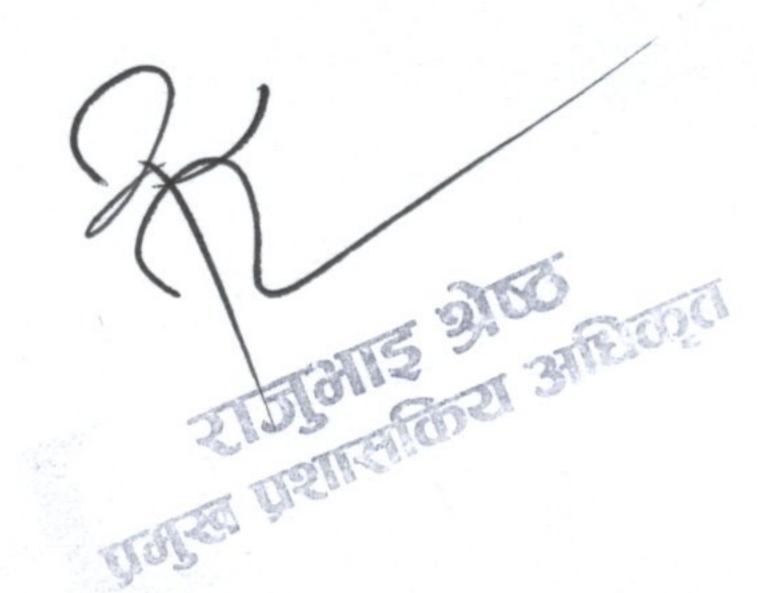
#### 1. Surveying

- 1.1 Levelling
  - 1.1.1 Principles and methods of levelling
  - 1.2.2 Levelling instruments and accessories
- 1.2 Plane Tabling
  - 1.2.1 Equipments required
  - 1.2.2 Methods of plane tabling
  - 1.2.3 Two and three point problems

### 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: Type and selection; preparation techniques and use
- 2.5 Bitumen: Type, selection and use

## 3. Mechanics of Materials and Structures

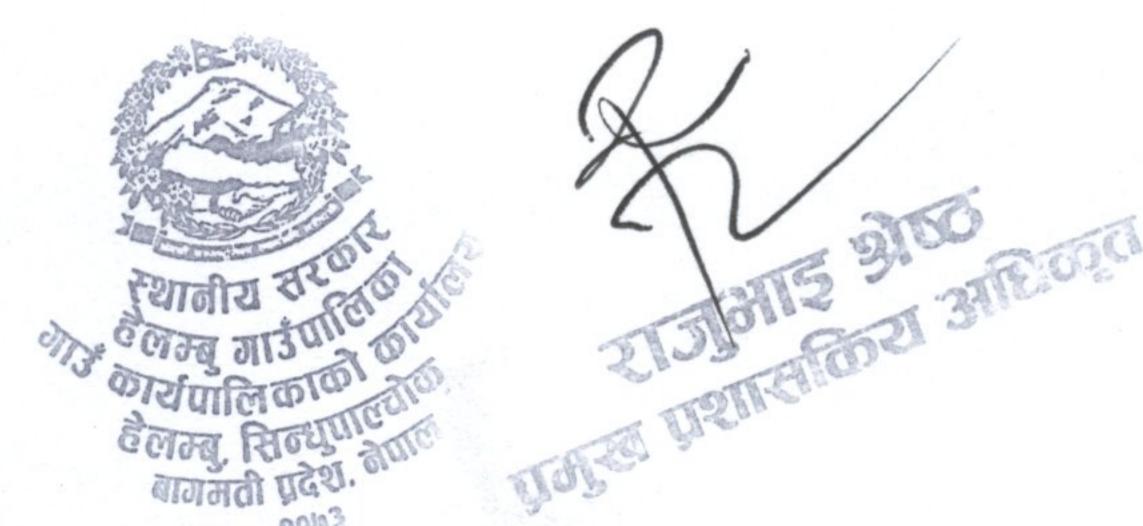
- 3.1 Mechanics of Materials
  - 3.1.1 Internal effects of loading
  - 3.1.2 Ultimate strength and working stress of materials
- 3.2 Mechanics of Beams
  - 3.2.1 Relation between shear force and bending moment
  - 3.2.2 Shear and bending moment diagrams for statically determinate beams under various 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
    - 5.4 Flows: 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
  - 5.3.2 Optimum moisture content
  - 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

#### 6. Structures

- 6.1 R.C. Sections in Bending
  - 6.1.1 Under reinforced, over reinforced and balanced sections
  - 6.1.2 Analysis of single and double reinforced rectangular section
- 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 Design and Working System of R.C. Structures
  - 6.4.1 Singly and doubly reinforced rectangular beams
  - 6.4.2 Simple one-way and two-way slabs
  - 6.4.3 Axially loaded short and long columns

## 7. Building Construction Technology

- 7.1 Foundations
  - 7.1.1 Subsoil exploration

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- 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 and thickness of walls
- 7.2.2 Use of scaffolding
- 7.3 Damp Proofing
  - 7.3.1 Source of Dampness
  - 7.3.2 Remedial measures for damp proofing
- 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
  - 8.3.2 Maximum, Minimum and self cleaning velocity
- 8.4 Excreta Disposal and Unsewered Area
  - 8.4.1 Pit latrine
  - 8.4.2 Design of septic tank

## 9. Irrigation Engineering

- 9.1 General
  - 9.1.1 Need for irrigation; advantages of irrigation
  - 9.1.2 Sources of irrigation: water, river & streams, ground water and others
  - 9.1.3 Methods of irrigation: surface, sub-surface and others
- 9.2 Irrigation Water Requirement
  - 9.2.1 Crop season, principal crops, and crop water requirements
  - 9.2.2 Base period & duty
- 9.3 Irrigation Canals
  - 9.3.1 Canal losses and their minimization
  - 9.3.2 Irrigation requirements and design discharge of canal permissible velocities for different canals
  - 9.3.3 Design of canal based on Manning's & Lacey's formulae
  - 9.3.4 Need and location of escapes
  - 9.3.5 Components of distribution system

### 10. Highway Engineering

- 10.1 General
  - 10.1.1 Classification of road in Nepal
  - 10.1.2 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 Super elevation



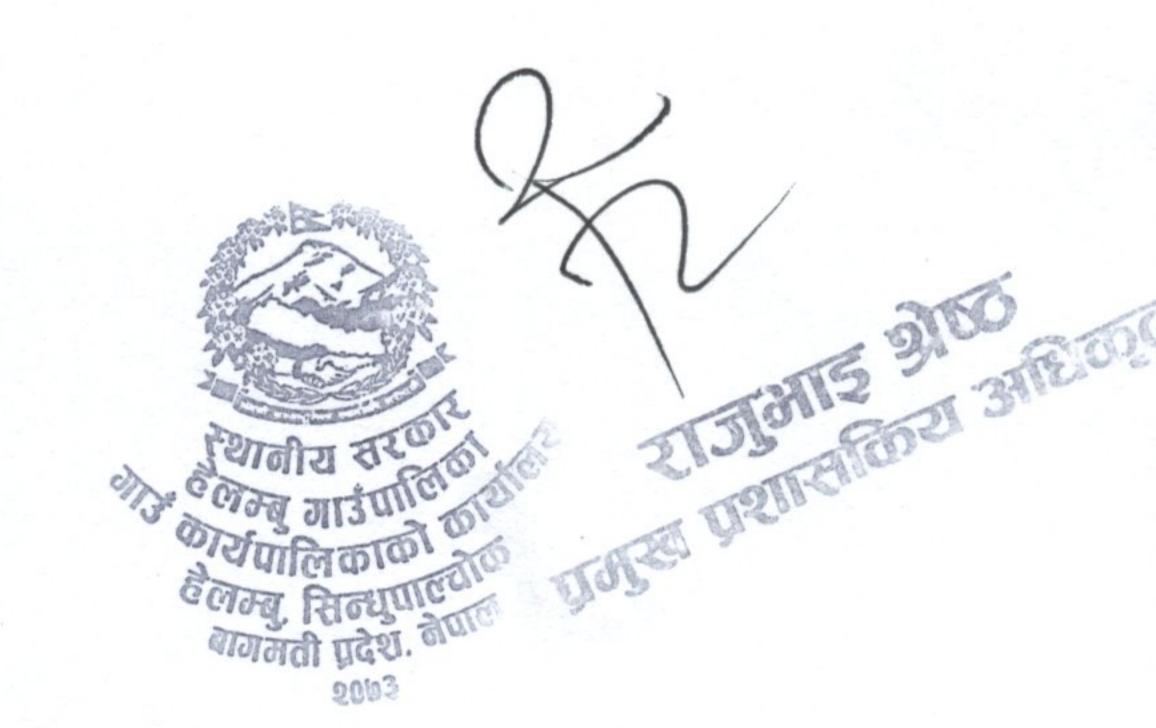
- 10.2.6 Sight distances
- 10.2.7 Gradient
- 10.2.8 Use of Nepal Road Standard and subsequent revision in road design
- 10.3 Drainage System
  - 10.3.1 Importance of drainage system and requirements of a good drainage system
- 10.4 Road Pavement: Pavement structure and its components: subgrade, sub-base, base and surface courses
- 10.5 Road Machineries
  - 10.5.1 Earth moving and compacting machines
- 10.6 Road Construction Technology
- 10.7 Road Maintenance and Repair: Type of maintenance works
- 10.9 Tracks and Trails

## 1 1. Estimating and Costing

- 11.1 General
  - 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 Site Management
  - 12.1.1 Preparation of site plan
  - 12.1.2 Organizing labor
  - 12.1.3 Measures to improve labor efficiency
  - 12.1.4 Accident prevention



## 12.2 Procurement and Contract Procedure

- 12.2.1 Contracts and its types
- 12.2.2 Departmental works and day-work
- 12.2.3 Preparation of tender document
- 12.2.4 Tender procedure
- 12.2.5 Contract agreement
- 12.2.6 Conditions of contract
- 12.2.7 Construction supervision

## 12.3 Planning and Control

- 12.3.1 Construction schedule
- 12.3.2 Equipment and materials schedule
- 12.3.3 Construction stages and operations

# खण्ड-२: कम्प्युटर सम्बन्धी प्रयोगात्मक परीक्षा -५० अङ्क

- 1. Computer fundamental
- 2. Operating System
- 3. Word processing
- 4. Electronic spreadsheet
- 5. Database management system
- 6. Presentation system
- 7. Internet Browsing & Website Management.

समयः ३० मिनेट