ईन्जिनियर तथा सव ईन्जिनियरको पाठ्यक्रम

समयः ४५ मिनेट   पूर्णाङ्कः ४० अंक

क्र.सं.	पाठ्यक्रमको क्षेत्र	बहुउत्तर वस्तुगत प्रश्न		कैफियत
		प्रश्न संख्या	अंक भार	
१	सेवा कार्य सम्बन्धि	१०	१	बहुउत्तर वस्तुगत प्रश्न
२	प्राविधिक कार्य सम्बन्धि	३०	१	

१. सेवा सम्बन्धि पाठ्यक्रम

क) स्थानीय सरकार संचालन ऐन, २०७४

ख) स्थानीय तहको वजेट तर्जुमा प्रक्रिया, खर्च व्यवस्थापन र लेखा परिक्षण तथा गुणासो व्यवस्थापन

ग) स्थानीय तहको वजेट तर्जुमा, कार्यान्वयन, अनुगमन तथा मुल्यांकन प्रक्रिया

घ) स्थानीय विकास तथा सेवा प्रवाह प्रक्रियामा जनसहभागिता, पारदरशिता र उत्तरदा यित्व

ङ) सार्वजनिक खरिद नियमावली, २०६४

२. प्राविधिक कार्य सम्बन्धि पाठ्यक्रम

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

22 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 23

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 24

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 25

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 26

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 27

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

कम्प्यूटर अपरेटर तथ सहायक कम्प्यूटर अपरेटरको पाठ्यक्रम

समयः   ११ घण्टा   पूर्णाङ्कः ४० अंक

क्र.सं.	पाठ्यक्रमको क्षेत्र	बहुउत्तर वस्तुगत प्रश्न		कैफियत
		प्रश्न संख्या	अंक भार	
१	कम्प्यूटर सम्बन्धि विषयको लिखित (समयः ३० मिनेट)	२०	१	बहुउत्तर वस्तुगत प्रश्न
२	कम्प्यूटर सम्बन्धि विषयको प्रयोगात्मक (समयः ३० मिनेट)	५	४	प्रयोगात्मक

1. Computer fundamental

2. Operating System

3. Word processing

4. Electronic spreadsheet

5. Database management system

6. Power Point Presentation system

7. Internet Browsing & Website Management.