लोक सेवा आयोग

नेपाल इन्जिनियरिङ्ग सेवा, सिभिल समूह, इरिगेशन उपसमूह, राजपत्रांकित प्रथम श्रेणी (सहसचिव वा सो सरह पद) को खुला र आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

द्वितीय पत्र सेवा सम्वन्धी प्राविधिक विषय पूर्णाङ्क :- १००

1. **Introduction**
   - 1.1 Water sector policies and strategies with respect to irrigation development
   - 1.2 Major development projects and economic policies affecting the irrigation sector
   - 1.3 History of irrigation development in Nepal
   - 1.4 Impact of irrigation development in the poverty reduction strategy
   - 1.5 Strategy and policies for the mitigation and management of floods
   - 1.6 Evolution of policies shifting from agency managed to farmer managed system
   - 1.7 Overview of Irrigation development in the SAARC region
   - 1.8 Irrigation development in current plan period
   - 1.9 National economy and irrigation development strategy
   - 1.10 Resource mobilization in irrigation sector
   - 1.11 External financing in irrigation sector

2 Concept and Principles
   - 2.1 Issues and Problems of irrigation development in Terai and hills
   - 2.2 Design, philosophy and approaches to different types of irrigation system development
   - 2.3 Design, philosophy and approaches of disaster mitigation with reference to landslide and floods
   - 2.4 Concept of bio-engineering for watershed management
   - 2.5 Integrated Water Resources Management and Role of Irrigation

3 Planning and Design
   - 3.1 Surface Irrigation System
     - 3.1.1 Designing of Head Works
     - 3.1.2 Design Consideration of canals, canal structures and cross drainage Works
     - 3.1.3 Hydrology and Agro-meteorology
     - 3.1.4 Design philosophy and approaches
     - 3.1.5 Water availability for diversion crop water requirement; and water requirement at headwork.
     - 3.1.6 Sediment transport and its effects on head works
     - 3.1.7 Farm drainage planning and design
   - **3.2 Ground Water System**
     - 3.2.1 Ground water development planning
     - 3.2.2 Ground water hydrology and construction of tube wells.
     - 3.2.3 Sediment Transport and its effects on headworks
     - 3.2.4 Farm Drainage planning and Design
     - 3.2.5 Design consideration for deep and shallow tube wells
   - **3.3 Multipurpose Projects**
     - 3.3.1 General planning of multipurpose reservoirs
     - 3.3.2 Capacity of reservoir
     - 3.3.3 Selection of suitable site for a reservoir
     - 3.3.4 Flood routing or flood absorption.
     - 3.3.5 General design considerations for dams
     - 3.3.6 Criteria for structural stability of gravity dams.
     - 3.3.7 Design consideration of spillways and its types
     - 3.3.8 Aeration arrangement in gated and overflow spillways

3.4 River Training Works

3.4.1 River morphology, design, concept of different types of river training structures

3.4.2 Concept of sediment transport and its influence on river training works

3.4.3 River training and bank protection principles

3.4.4 Inundation Problem in Nepal

4 Management and Other Related Aspects

4.1 Water resources management planning, opportunities, threats, organization, actuation, and controlling

4.2 Watershed management and integrated water use plan

4.3 Participatory irrigation management in Nepal

4.4 Ground water management

4.5 Private sector involvement and contracting

5 Engineering Costing and Economic Analysis

5.1 Different approaches to cost estimates

5.2 Economic analysis of project

5.3 Economic concept

6 Construction Management

6.1 Classification of irrigation projects

6.2 Methods and construction technology

6.3 Contract management and quality aspect of construction

6.4 Monitoring and evaluation at each level of project

6.5 Quality control and assurance

7 Maintenance and Rehabilitation

7.1 Maintenance management system and its analytical approach

7.2 Maintenance concept and methods

7.3 Personnel, plant and equipment management

7.4 Process and performance of irrigation management

7.5 Participatory management, collection of irrigation service fee

7.6 Transfer of operation and management to private party

7.7 Contract disputes resolution

7.8 Concept of value engineering

7.9 Subsidy issues

8 Environmental Impact Assessment

8.1 Concept of environmental assessment, Initial Environmental Examination (IEE), Environmental Impact Assessment (EIA) and role of EIA, types of environmental impacts and principles

8.2 Environmental and social impact assessment in irrigation projects and its mitigation

8.3 Environmental impacts assessment methodology: screening, scooping, and initial impact identification, Initial Environmental Examination (IEE), TOR preparation and writing EIA report

8.4 Management of EIA procedures: public participation, EIA review, mitigation measures and monitoring

8.5 Environmental auditing.
