लोक सेवा आयोग

नेपाल इञ्जिनियरिङ्ग सेवा, सिभिल समूह, हाइड्रोपावर उपसमूह, राजपत्राङ्कित द्वितीय श्रेणी, खुला र आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

द्वितीय पत्र - सेवा सम्बन्धी प्राविधिक विषय पूर्णाङ्कः- १००

1. **Hydropower Development in Nepal**
   - 1.1 Resources base
   - 1.2 Institutional framework
   - 1.3 Status of Hydropower and other Energy
   - 1.4 Hydropower policy
   - 1.5 Participation of private sector in development of hydropower

2. **Water Resources Planning**
   - 2.1 Overall Planning
   - 2.2 Water Resources planning
   - 2.3 Integrated Planning
   - 2.4 Basin-wise planning
   - 2.5 Short, Medium and Long term Planning
   - 2.6 Selection of Master Plan

3. **Hydropower Plants**
   - 3.1 Development Objectives
   - 3.2 Production Patterns and Output Profiles
   - 3.3 Cost Characteristics

4. **Investigation of Hydropower Project**
   - 4.1 Investigation purpose
   - 4.2 Basic Investigation
   - 4.3 Specific Purpose Investigation
   - 4.4 Identification of potential projects
   - 4.5 Basis of ranking

5. **Planning of Hydropower Projects**
   - 5.1 Investigation of hydropower projects
     - 5.1.1 Planning parameters
     - 5.1.2 Power market
     - 5.1.3 Environmental issues
     - 5.1.4 Socio-economic consideration
     - 5.1.5 Project Appraisal
   - 5.2 Hydropower Development Phase
     - 5.2.1 Reconnaissance studies
     - 5.2.2 Pre-feasibility studies
     - 5.2.3 Feasibility studies

6. **Evaluation of Hydropower Project**
   - 6.1 Basic Criterion and Assumptions
   - 6.2 Cost comparison
   - 6.3 Benefit assessment
   - 6.4 Risk Analysis
   - 6.5 Cost-Benefit Analysis
   - 6.6 Financial Analysis
   - 6.7 Economic Analysis
   - 6.8 Sensitivity Analysis

7. **Financing Strategies**
   - 7.1 Financing Plan
   - 7.2 Financing Options

8. **Implementation of Hydropower Projects**
   - 8.1 Definitive Study and Final design
   - 8.2 Procurement and Construction
   - 8.3 Quality Control
   - 8.4 Monitoring and Evaluation

9. **Trans-boundary / Bilateral Water Resource Projects**
   - 9.1 Assessment and Sharing of benefits
   - 9.2 Water rights
   - 9.3 Potential for Power Export
   - 9.4 Existing Treaties

10. **Tariffs**
    - 10.1 Principles
    - 10.2 Tariff Design
    - 10.3 Consumer categories
    - 10.4 Rate Formulation Process

11. **Environmental Issues**
    - 11.1 EIA procedure and their implementation
    - 11.2 Environment and Development issues

12. **Independent Power Producers (IPP)**
    - 12.1 Concept and Objectives
    - 12.2 Legal and Regulatory Provisions
    - 12.3 Stakeholders
    - 12.4 Security Packages
    - 12.5 Project Financing
    - 12.6 Risk Analysis and Mitigation
    - 12.7 Concept of Project Agreement
    - 12.8 Concept of Power Purchase Agreement

Model Questions

Analytical Review – Each carrying 15 marks

1. What are the major challenges in water resource planning? Why is the river basin approach recommended? What kind of information and tools need to be gathered before sitting down to plan the water resources in a river basin?
2. Outline the important considerations in the planning of a hydropower project. How is project evaluation carried out?
3. Summarize the additional investigations required for the feasibility study of a storage hydropower scheme in addition to those for a run-of-river project.
4. What are the common impacts of a hydropower project on the physical, biological and socio-economic environments? What kinds of impacts are not remediable in your opinion?

Analytical and Problem Solving - Each carrying 20 marks

1. Is hydro business really attractive to the private sector in Nepal? What sort of sectoral reforms would accelerate the pace of hydropower development in Nepal?
2. How are the benefits from a trans-boundary water resources project assessed? Provide a prescription for benefit sharing between Nepal and India supposing that the Karnali-Chisapani Mega Project is to be implemented in the near future.