

# नेपाल विद्युत् प्राधिकरण

प्राविधिक सेवा, मेकानिकल समूह, तह-९ उपप्रबन्धक पदको  
प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

१. लिखित परीक्षाको विषय, पूर्णाङ्क, परीक्षा प्रणाली, प्रश्नसंख्या, अंकभार र समय निम्नानुसार हुनेछ ।

पत्र	विषय	पूर्णाङ्क	परीक्षा प्रणाली	प्रश्न संख्या	प्रति प्रश्न अंकभार	समय
प्रथमपत्र	सेवा सम्बन्धी	६०	विषयगत	छोटो उत्तर	८	५
				लामो उत्तर	२	१०
द्वितीयपत्र	व्यवस्थापकीय ज्ञान	४०	विषयगत	छोटो उत्तर	४	५
				समस्या समाधान	१	२०

२. प्रथमपत्र र द्वितीयपत्रको परीक्षा २ पटक गरेर हुनेछ । प्रथमपत्रको परीक्षा सकिए पछि द्वितीयपत्रको परीक्षा तत्काल हुनेछ ।
३. परीक्षाको माध्यम नेपाली वा अंग्रेजी भाषा हुनेछ ।
४. सामान्यतः प्रत्येक शिर्षकको अंकभार तोकिए बमोजिम हुनेछ ।

**प्रथमपत्र : सेवा सम्बन्धी [60]**

## **1. HYDROPOWER ENGINEERING [5+5]**

- Types of turbines and pumps and their maintenance
- Selection criteria of turbines and pumps for the site condition and system
- Characteristics of different types of pumps and turbines and their efficiency curves
- Arrangement of turbines-generator (horizontal or vertical) and their merits and demerits
- Alignment technique and procedures of turbines and pumps
- Different types of bearings, their uses and maintenance

## **2. WATER TURBINES [5+5]**

- Selection of turbines
- Cavitation in turbines, cavitation factor and methods used to avoid cavitation
- Draft tube and its function, efficiency
- Characteristics curves

## **3. HYDRO-MECHANICAL EQUIPMENT [5+5]**

- Types of penstock pipes, their uses and their design criteria
- Types, selection and design criteria of gates and hoisting mechanism used in hydropower plant
- Purpose, types and uses of inlet valve
- types, uses of cranes

## **4. WATER TURBINE GOVERNORS [5]**

- Types of governors used in hydropower plant; their working principles, characteristics, applications and maintenance

## **5. POWER PLANT INSTRUMENTS [5]**

- Measurement of pressure, flow, temperature, speed, voltage, ampere, power and energy
- Types of communication used in utilities and their application

## **6. TRANSMISSION AND DISTRIBUTION [5]**

- Types and selection of poles and towers used in different voltage level and their design criteria

## **7. SAFETY ENGINEERING [5]**

- Safety rules and regulations for handling explosive, compressive gases and flammable substance
- Physical effects of electric shocks, safety and precaution, safety tolls and devices, live line maintenance and precautions
- First aid requirement after shock treatment
- Fire hazards: fire fighting techniques and equipment
- Noise hazards: sources, control and affect on health

## **8. MAINTENANCE MANAGEMENT [5+5]**

- Types of maintenance systems: breakdown, preventive, proactive
- Failure analysis
- Conditioning monitoring maintenance planning and control
- Equipment and tools used in maintenance

- Maintenance management of equipment in hydropower plant
- Maintenance management of equipment in diesel power plant
- Maintenance management of construction equipment

**द्वितीयपत्र : व्यवस्थापकीयज्ञान [40]**

**A. 1. POWER SECTOR DEVELOPMENT AND INSTITUTIONS INVOLVED: [5]**

History of power development in Nepal, Energy demand supply trends, Challenges and prospects of hydropower development, Importance of power exchange agreement with India, Cross border/regional power trade, Scope of power exchange with other countries, Coordination between stakeholders in power sector, Scope for export oriented development of power sector, NEA's mission and objectives, Basic trends in NEA development, Policies and programs of NEA, Financing of NEA, Indicators of NEA financial performance, NEA rules and regulations on employment, procurement and promotion, Inventory control, Impediments for growth and possible reform measures, Role of Government institutions involved in power sector development, Role and importance of IPPs, Major projects under implementation and planning.

**2. LEGAL PROVISIONS FOR POWER SECTOR DEVELOPMENT: [5]**

Hydropower Development policy, 2058, Water Resources Act, 2049, Water Resources Regulations, 2050, Electricity Act, 2049, Electricity Regulation, 2050, Nepal Electricity Authority Act, 2041, Environment Protection Act, 2053, Environment Protection Regulation, 2054, Electricity Pilferage Control Act, 2058, Electricity Pilferage control regulation, 2059, Electricity Tariff Fixation Regulation 1993, Land Acquisition Act.2034, Industrial Policy 2049,

**3. ENGINEERING ECONOMICS: [2.5]**

Cash flow analysis, Project evaluation indicators, Payback period, Criteria for capital investment decision, Risk analysis, Taxation system in Nepal, Energy tariff and regulatory issues.

**4. PROJECT MANAGEMENT: [2.5]**

Project Planning and Scheduling: Network models, CPM/PERT, Manpower leveling, Material scheduling, Project preparation for implementation and justification of the project.

Project monitoring and control: System of control, Project control cycle, Feedback control systems, Cash control.

Capital Planning and Budgeting: Capital planning procedures, Preparation of operating budgets, fixed and flexible budget, budgetary control.

**5. ORGANIZATION AND MANAGEMENT: [2.5]**

Concept of Management, Internal Organization, Motivation, Leadership, control, coordination and team work, Decision making, Corporate planning and strategic management, Management Information System, Job description, Job analysis, Performance appraisal, Auditing and inventory control, Personnel Management, Familiarization with procurement guidelines and standards of World Bank, ADB, Preparation of Contract documents, specifications, condition of contract and other contractual procedures.

**6. सेवासंग सम्बन्धी निर्देशिका (Manuals) हरु : [2.5]**

Safety Guidelines/standards for Electricity Generation, Transmission and Distribution of Hydropower Projects, Manual for preparing Environmental Management Plan (EPM) for Hydropower Projects, National Environmental Impact assessment Guidelines, 1993.

**B. समस्या समाधान : [20]**

व्यवस्थापकीय कार्यसंग सम्बन्धित कुनै एउटा समस्या दिईनेछ । प्रचलित ऐन नियमको परिधि र अवस्था समेतलाई विचार गरी दिइएको समस्याको निम्न आधारमा उपयुक्त समाधान र सुझाव प्रस्तुतगर्नु पर्नेछ –

(१) समस्याका खास खास कारणहरु दर्शाउने ।

(२) समस्या समाधानका लागि सुझावहरु प्रस्तुत गर्ने ।

(३) प्रस्तुत सुझावहरु कार्यान्वयन गर्दा त्यसबाट पर्न सक्ने सकारात्मक प्रभावहरु उल्लेख गर्ने ।

**द्रष्टव्य:** पाठ्यक्रममा राखिएका संविधान, ऐन, नियम र विनियमहरु परीक्षा हुनु भन्दा ३ महिना अगाडी सम्म संशोधन वा खारेज भई त्यसको सट्टा हाल प्रचलनमा रहेकालाई सोही अनुरूप पाठ्यक्रममा समावेश भएको मानिने छ ।