

नेपाल विद्युत प्राधिकरण

प्राविधिक सेवा, मेकानिकल समुह, तह-९ उप-प्रबन्धक पदको
खुला तथा आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

द्वितीय पत्र: सेवा सम्बन्धी विस्तृत ज्ञान (१०० पुर्णाङ्क)

पत्र	विषय	पुर्णाङ्क	उत्तीर्णाङ्क	खण्ड	परीक्षा प्रणाली	प्रश्न संख्या	प्रति प्रश्न अङ्कभार	समय
द्वितीय	सेवा सम्बन्धी (विस्तृत ज्ञान)	१००	४०	क	लामो उत्तर/ विश्लेषणात्मक समिक्षा	२	१५	३ घण्टा
					विश्लेषणात्मक समिक्षा/समस्या समाधान	१	२०	
				ख	लामो उत्तर/ विश्लेषणात्मक समिक्षा	२	१५	
					विश्लेषणात्मक समिक्षा/समस्या समाधान	१	२०	

खण्ड (क)

(२x१५=३०, १x२०=२०) - अङ्क ५०

1. Hydropower Engineering:

- 1.1. History and development of Hydro power in Nepal and world
- 1.2. Types of Hydro power plant: run-of-river, Peaking RoR, storage, pumped storage
- 1.3. Classification of hydropower plant: large, medium, small, mini and micro hydropower plants
- 1.4. Safety measures and precautions applied in power plant
- 1.5. Environmental impact of hydropower plant

2. Water turbines:

- 2.1. Classification of turbines on various criteria
- 2.2. Main components of turbines and their functions
- 2.3. Working principle of turbines and their efficiencies
- 2.4. Specific speed of a turbine
- 2.5. Criteria for Selection of turbines
- 2.6. Operation & Maintenance of turbines & its Components.

3. Water turbine governors:

- 3.1. Types and working principles
- 3.2. Operation and maintenance

4. Hydro-mechanical equipment:

- 4.1. Types, selection, use and design of gates, Stop Logs, seals and hoisting equipment
- 4.2. Use and design of trash rack and safety rack
- 4.3. Design, selection of penstock and accessories
- 4.4. Constructional detail and working principles of valves

- 4.4.1. Requirements & principle of operation,
- 4.4.2. Types & selection criteria of Turbine valves Inlet
- 4.4.3. their operation, control & Maintenance

5. Power plant instruments:

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

6. Working principles, Operation & maintenance of auxiliary system:

- 6.1 High pressure Oil unit,
- 6.2 Turbine Oil & lubrication system,
- 6.3 Braking and jacking system,
- 6.4 Black Start and diesel generator system
- 6.5 Carbon dust collection system for slip rings,
- 6.6 Oil filtration system,
- 6.7 Cooling water system,
- 6.8 E.O.T. crane,
- 6.9 Ventilation and air conditioning,
- 6.10 Compressed air system,
- 6.11 Dewatering and drainage system
- 6.12 Shaft Sealing System.

खण्ड (ख)

(२x१५=३०, १x२०=२०) – अङ्क ५०

7. Transmission and distribution:

- 7.1. Types and selection of poles and towers used in different voltage level and their design criteria, Erection & Maintenance.

8. Safety engineering:

- 8.1 Safety rules and regulations for handling explosive, compressive gases and flammable substance, electric shock.
- 8.2 Occupational Health & Safety in Powerplants, safety and precaution, safety tools and devices, live line maintenance and precautions
- 8.3 First aid requirement after shock treatment
- 8.4 Fire hazards: firefighting techniques and equipment
- 8.5 Noise hazards: sources, control and effect on health

9. Maintenance management:

- 9.1 Types of maintenance systems: breakdown, preventive, proactive
- 9.2 Failure analysis
- 9.3 Conditioning monitoring maintenance planning and control
- 9.4 Equipment and tools used in maintenance
- 9.5 Maintenance management of equipment in hydropower plant
- 9.6 Wear resistant Coating, Soft & Hard Coating in Turbine Parts
- 9.7 Maintenance management of Hydromechanical & E/M equipment, construction equipment.

10. Engineering economics:

- 10.1 Cash flow analysis, project evaluation indicators
- 10.2 Project evaluation methods
- 10.3 Criteria for capital investment decision, risk analysis
- 10.4 Taxation system in Nepal, energy tariff and regulatory issues

11. Contract management:

- 11.1 Familiarization with procurement guidelines and standards of Nepal Govt (PPMO) and donor agencies (World Bank, ADB etc.)
- 11.2 Preparation of contract documents, specifications, condition of contract and other contractual procedures
- 11.3 Arbitration

12. International treaties and conventions:

- 12.1. Treaty between the then Government of Nepal and Government of India concerning the integrated development of Mahakali River including Sarada Barrage, Tanakpur Barrage and Pancheshwor Project.

13. Service-related manuals:

- 13.1. Safety guidelines/standards for electricity generation, transmission and distribution of hydropower projects
- 13.2. Manual for preparing environmental management plan (EPM) for hydropower projects
- 13.3. National environmental impact assessment guidelines 1993
- 13.4. Manual or Guideline for operation & maintenance of Hydropower plant.

