

नेपाल विद्युत् प्राधिकरण

प्राविधिक सेवा, मेकानिकल समूह, तह-८ सहायक प्रबन्धक 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 | ७० | विषयगत | छोटो उत्तर | ८ | ५ |
| | | | | लामो उत्तर | ३ | १० |
| द्वितीयपत्र | व्यवस्थापकीय ज्ञान | ३० | विषयगत | छोटो उत्तर | ३ | ५ |
| | | | | समस्या समाधान | १ | १५ |

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 [70]

1. HYDROPOWER ENGINEERING [5+5]

- History and development of water power in Nepal and world
- Types of power plant: run-of-river, storage, pumped storage
- Classification of hydropower plant: large, medium, small, mini and micro hydropower plants
- Safety measures and precautions applied in power plant
- Environmental impact of hydropower plant

2. WATER TURBINES [5+5]

- Classification of turbines on various criteria
- Main components of turbine and their functions
- Working principle of turbines and their efficiencies
- Specific speed of a turbine
- Selection of turbines

3. WATER TURBINE GOVERNORS [5]

- Types and working principles
- Operation and maintenance

4. HYDRO-MECHANICAL EQUIPMENT [5+5]

- Types, selection, use and design of gates, seals, hoisting equipment and valves
- Use and design of trashrack and safety rack
- Design, selection of penstock and accessories

5. PUMPS [5]

- Types, working principles, selection of pumps
- Operation and maintenance of pumps

6. INTER COMBUSTION ENGINE AND POLLUTION [5+5]

- Introduction of IC engine: Engine classification, engine operating cycles, engine components
- Thermo-chemistry of fuel-air mixture: characteristics of flames, composition of air and fuel, combustion stoichiometry, the first law of thermodynamics and combustion, the second law of thermodynamics applied to combustion.
- Fuel and fuel supply system: types of fuel used in IC engines, fuel supply system in SI and CI engine.
- Ignition system: Purposes, types, components and their functions, problems associated to ignition system.

- Cooling system: Purposes, types, components and their functions, problems related to cooling system.
- Lubricants and lubrication system: classification of lubricants and their uses, purposes, types, components and their functions of lubricating system.
- Pollution formation and control: pollution formation (source and chemistry), emission standards (national and international); tailpipe emission measuring instrument (gas analysers); controlling measures (engine design, after treatment and use of alternative fuels; noise pollution).
- Engine operating characteristics: engine performance parameters, indicated and brake power and mean effective pressure; operating variables that affect SI engine performance, efficiency and emission; SI engine combustion chamber design; variables that affect CI engine performance, efficiency and emission; supercharged and turbocharged engine performance.

7. CONSTRUCTION EQUIPMENT [5+5]

- Introduction to construction equipment: types, general specification and application of construction equipment
- Hydraulic system: pump, valve, cylinders and moors, accumulator and filters, reservoirs, hoses, pipe, tubes and couplers, seals and fluids
- Transmission: clutches, mechanical transmission, hydraulic assist transmissions, power shift transmission, hydrostatic drive, torque converters, differential, final drive, power take-offs, special drives.
- Undercarriage: track chain, idler, sprocket, track rollers, tyres
- Implements and tool: blades, rippers, bucket
- Electronic components and their functions:
- Repair and maintenance of construction equipment:

8. RENEWABLE ENERGY TECHNOLOGIES [5]

- Renewable energy sources: biomass, solar energy, wind energy, geothermal energy
- Renewable energy technologies for electricity generation: solar PV, wind power generator, biogas generator.
- Role or renewable energy technologies in rural electrification.
- Environmental benefits of renewable energy technologies

9. AIR CONDITIONING [5]

- Air conditioning system design: summer air conditioning, winter air conditioning
- Estimation of cooling and heating load
- Selection of air-conditioning apparatus for cooling
- Noise, vibration and volume control

द्वितीयपत्र : व्यवस्थापकीयज्ञान [30]

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, 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 promotions, 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: [2.5]

Hydropower Development Policy, 2058, Water Resources Act, 2049, 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.

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]

Internal Organization, Management Information System, Motivation, Leadership and team work, Decision making, Corporate planning and strategic management, 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.

B. समस्या समाधान : [15]

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

(१) समस्याका खास खास कारणहरू दर्शाउने ।

(२) समस्या समाधानका लागि सुझावहरू प्रस्तुत गर्ने ।

(३) प्रस्तुत सुझावहरू कार्यान्वयन गर्दा त्यसबाट पर्ने सक्ने सकारात्मक प्रभावहरू उल्लेख गर्ने ।

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

