नेपाल विद्युत् प्राधिकरण

प्राविधिक सेवा, ईलेक्ट्रिकल समूह, ईलेक्ट्रिकल उपसमूह, तह–८ सहायक प्रवन्धक पदको प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

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

पत्र	विषय	पूर्णांङ्क	परीक्षा प्रणाली		प्रश्न संख्या	प्रति प्रश्न अंकभार	समय
प्रथमपत्र	सेवा सम्वन्धी	७०	विषयगत	छोटो उत्तर	८	५	२ घण्टा
				लामो उत्तर	३	१०	
द्वितीयपत्र	व्यवस्थापकीय ज्ञान	३०	विषयगत	छोटो उत्तर	३	५	१ घण्टा
				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. सामान्यत: प्रत्येक शिर्षकको अंकभार तोकिए बमोजिम हुनेछ ।

प्रथमपत्र : सेवा सम्वन्धी [70]

1. MODERN TRENDS IN ELECTRIC UTILITIES: [5]

- Privatization of Utilities, Independent power producers, Energy wheeling, Energy pool market, Private participation in hydropower development, Power purchase agreement, Recent trends in power sector reform, Unbundling and Power system deregulation.

2. ELECTRICAL MACHINES: [15]

- Transformers: Construction, Equivalent circuits, Operating characteristics, Losses and efficiency, Voltage regulation, Connections, Grounding, Current harmonics, Parallel operation, Overloading capacity, Temperature rise, Auto-transformers, Instrument transformers.
- Synchronous Machines: Construction, Operating Characteristics, Losses and efficiency, Steady state and transient equivalent circuits, Excitation system and requirements, Stability, Parallel operation and hunting, Field of applications.
- Induction Machines: Construction, Operating Characteristics, Losses and efficiency, Equivalent circuits, Starter and speed control of induction motor, Induction generator controllers and harmonics, Field of applications and selection of induction machines.
- DC Machines: Construction, Characteristics, Losses and efficiency, Armature reaction, Starter and speed regulation of motors, Applications.

3. POWER PLANTS: [5]

- Hydropower potential, Types and layouts of hydropower plant, Turbine types and application, Flow regulations, Reservoir operation, Pumped storage plant, Environmental impact of hydropower development, Principle, layouts, costs, environmental impacts of steam, gas, nuclear, wind and solar power plants.

4. POWER SYSTEM ANALYSIS: [5×2, 10×1]

- Load flow study: Basic power flow equation for a network and methods of solutions, Effect of voltage and frequency, Real power/frequency balance, Reactive power/ Voltage balance, Voltage control, VAR compensation.

- Power system stability: Steady state, dynamic and transient stability, Equal area criterion, Swing equation for a multi-machine system, Steady-state stability implications.
- Control and protections: Types of faults in power system, Fault calculation, Principles of power system protection, Protection system components, Disconnecting switches and contactors, Types and characteristics of circuit breakers and protective relays, Automatic reclosure, Protection of generators, transformers and transmission/distribution lines, Lightning protection, Governor's principle and characteristics.
- Transmission Systems: Choice of voltage, Surveying, Route selection, Right of way, Substation lay out and location, Bus bar schemes, Working and application of HVDC transmission system, Performance of short, medium and long lines, Surge impedance and surge impedance loading of transmission lines, Proximity effect, Skin effect, Corona.
- Distribution Systems: Types of Distribution systems, Distribution substations, bus bar schemes, power factor correction, Consumer supply and metering systems, Protection coordination in distribution systems, Distribution system reliability indices, Rural distribution system, Loss reduction.
- Load dispatching: Principle of economic load dispatch, requirements, tools and role of dispatcher, Rationale and tools of demand side management.
- Quality of electricity: Supply quality parameters, Effect of quality on equipment and Application standards.

5. ELECTRIC ENERGY SYSTEM MANAGEMENT: [5]

- Electric power utility organization, Economic analysis and control of power utility, Electrical load forecasting, Generation scheduling, Technical and Economic issues of generation and energy dispatch, Grid Code.

6. RURAL ELECTRIFICATION: [5]

- Electricity and rural development, Technology and approaches for rural electrification, Role of micro and mini hydropower and other renewable energy technologies in rural electrification.

7. INSTRUMENTATION: [2.5]

- Theory of measurement, Transducers, Electrical signal transmission and processing, Analog-digital and Digital-analog converters, Digital instrumentation, Output devices, Display and recording system.

8. POWER ELECTRONICS: [5]

- Power diodes, Thyristors, Transistors, Gate turn off devices, AC to DC and DC to AC conversions, Harmonic filtering, Switched mode power supplies.

9. SAFETY ENGINEERING : [5]

- Effects of non-ionizing magnetic fields on human body, Physical effect of electric shock, Safety rules and regulations, Safety tools and devices, Live line maintenance and precautions, Earthing and shielding technique, Fire hazards, Fire fighting techniques and equipment, Noise hazard, First aid requirements after Electrical accidents.

10. COMPUTER APPLICATIONS: [2.5]

- Word processing, Spread sheets, Data base, Management information system, Familiarity with basic development s in computer hardware and software.

द्वितीयपत्र : व्यवस्थापकीयज्ञान

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

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: [2.5×1]

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: [2.5×1]

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: [2.5×1]

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: [2.5×1]

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 : [१५×१]

व्यवस्थापकीय कार्यसंग सम्वन्धित 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 कारणहरु दर्शाउने ।
(२) समस्या समाधानका लागि सुझावहरु प्रस्तुत गर्ने ।
(३) प्रस्तुत सुझावहरु कार्यान्वयन गर्दा त्यसवाट 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 अनुरुप पाठ्यक्रममा समावेश भएको मानिने छ ।

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