

नेपाल विद्युत प्राधिकरण

प्राविधिक सेवा, सबै समूह/उपसमूहको तह १०, प्रबन्धक पदको खुला/आन्तरिक प्रतियोगितात्मक परीक्षाको लागि पाठ्यक्रम

पाठ्यक्रम योजनालाई निम्नानुसार तीन चरणमा विभाजन गरिएको छः

प्रथम चरण:-	लिखित परीक्षा	पूर्णाङ्क:- २००
द्वितीय चरण:-	प्रस्तुतिकरण	पूर्णाङ्क:- २०
तृतीय चरण:-	अन्तर्वार्ता	पूर्णाङ्क:- ३०

परीक्षा योजना (Examination Scheme)

प्रथम चरण: लिखित परीक्षा

पूर्णाङ्क:- २००

पत्र	विषय	पूर्णाङ्क	उतीर्णाङ्क	खण्ड	परीक्षा प्रणाली	प्रश्नसंख्या * अङ्कभार	समय
प्रथम	शासकीय प्रबन्ध, व्यवस्थापन र व्यवसायिकता	१००	४०	क	सैद्धान्तिक-तर्कयुक्त र विषयगत	१ प्रश्न * १५ अंक	३ घण्टा
				ख	समस्या समाधानमूलक प्रश्न	२ प्रश्न * २० अंक	
					समस्या समाधानमूलक प्रश्न	१ प्रश्न * २० अंक	
					मामिला विश्लेषण सम्बन्धी प्रश्न	१ प्रश्न * २५ अंक	
द्वितीय	सेवा सम्बन्धी विस्तृत ज्ञान	१००	४०	क	सैद्धान्तिक-तर्कयुक्त र विषयगत	१ प्रश्न * १५ अंक	३ घण्टा
				ख	समस्या समाधानमूलक प्रश्न	२ प्रश्न * २० अंक	
					समस्या समाधानमूलक प्रश्न	१ प्रश्न * २० अंक	
					मामिला विश्लेषण सम्बन्धी प्रश्न	१ प्रश्न * २५ अंक	

द्वितीय चरण:- प्रस्तुतिकरण

पूर्णाङ्क:- २०

विषय	पूर्णाङ्क	परीक्षा प्रणाली	समय
प्रस्तुतिकरण	२०	व्यक्तिगत प्रस्तुतिकरण	३० मिनेट

तृतीय चरण:- अन्तर्वार्ता

पूर्णाङ्क:- ३०

विषय	पूर्णाङ्क	परीक्षा प्रणाली
अन्तर्वार्ता	३०	मौखिक

द्रष्टव्यः

१. लिखित परीक्षाको माध्यम भाषा नेपाली र अंग्रेजी अथवा नेपाली अंग्रेजी दुवै हुन सक्नेछ।
२. प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टा छुट्टै हुनेछ।
३. लिखित परीक्षामा सोधिने प्रश्नसंख्या र अंकभार यथासम्भव सम्बन्धित पत्र/विषयमा दिईए अनुसार हुनेछ।
४. विषयगत प्रश्नहरूको हकमा एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more Parts of a single question) र एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरू (Short notes) वा आदि सोध्न सकिनेछ।
५. विषयगत प्रश्न हुने पत्र/विषयमा प्रत्येक खण्ड/प्रश्नका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन्। परीक्षार्थीले प्रत्येक खण्ड/प्रश्नको उत्तर सोही खण्ड/प्रश्नको उत्तरपुस्तिकामा लेख्नु पर्नेछ।
६. यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जुनसुकै कुरा लेखिएको भए तापनि पाठ्यक्रममा परेका कानून, ऐन, नियम, विनियम तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेका सम्झनु पर्नेछ।
७. प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेवारहरूलाई मात्र द्वितीय र तृतीय चरणको परीक्षामा सम्मिलित गराइनेछ।
८. प्रस्तुतिकरणको परिक्षामा प्रयोग हुने प्रश्न सो परीक्षा शुरु हुनु भन्दा अगावै निर्माण एवं परिमार्जन गरिनेछ।
९. पाठ्यक्रम स्वीकृत मिति:- २०८०/०८/२१

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लागि पाठ्यक्रम

प्रथम पत्र:

शासकीय प्रबन्ध, व्यवस्थापन र व्यावसायिकता
(Governance, Management and Professionalism)

खण्ड (क) : ५५ अङ्क

1. Governance

- 1.1. Meaning, features and dimensions of governance
- 1.2. Global Governance System
- 1.3. Corporate governance System
- 1.4. The federal, provincial and local level governance
- 1.5. New Public Governance
- 1.6. Co-governance

2. Public Administration

- 2.1. Concept of Public Administration
- 2.2. Basics elements of Personnel Administration
- 2.3. financial Administration: Budget Preparation, Implementation, Monitoring and Evaluation, Financial control
- 2.4. Fiscal Federalism: Managing Federal, Provincial and Local Government Revenue and Expenditure
- 2.5. Public Policy: Formulation, Implementation, Monitoring and Evaluation

3. Management and Financial Analysis

- 3.1. Contemporary issues and Emerging concept of management: Time management, Resource management, Change management, Technology management, Information management, Performance Management, Grievance management, Team management, Conflict management, Crisis management, Stress management, Risk management, Participative management, Disaster Management and Work culture
- 3.2. Role and Importance of Leadership, Motivation, Team work, Decision making, Control and coordination in Management
- 3.3. Corporate planning and strategic management
- 3.4. Skill, Competencies and knowledge for successful manager
- 3.5. Issues and Challenges for Manager
- 3.6. Corporate social responsibility
- 3.7. Capital Planning and Budgeting: Capital planning procedures, Preparation of operating budgets, fixed and flexible budget, budgetary control
- 3.8. Financial analysis: Methods of financial analysis such as benefit cost ratio, internal rate of return, net present value, payback period, minimum attractive rate of return and their application; tariff structure
- 3.9. Management Information system, Enterprise Resource Planning
- 3.10. Issues and Challenges of Human Resource Management in Public Enterprises of Nepal

4. Ethics, morality and Accountability

- 4.1. Essence, determinants, consequences and dimensions of ethics
- 4.2. Human values, Norms and Perceptions
- 4.3. Ethics in public service
- 4.4. Ethical issues in public service delivery and utilization of public funds

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- 4.5. Challenges of corruption and corruption control strategies
- 4.6. Accountability, responsibility and authority
- 4.7. Compliance mechanism of public accountability
- 4.8. Spirituality at works

5. Professionalism

- 5.1. The foundational values for public service - integrity, impartiality, dedication, empathy, tolerance and compassion
- 5.2. Talent management
- 5.3. Negotiation skills

खण्ड: (ख) : ४५ अङ्क

6. Constitution, Policy, Act and Rules

- 6.1. Constitution of Nepal
- 6.2. Nepal Electricity Authority Act, 2041
- 6.3. Present Nepal Electricity Authority, Employee Service bylaws
- 6.4. Public Procurement Act, 2063, and Public Procurement Regulation, 2064
- 6.5. Present Nepal Electricity Authority, Financial Administration bylaws
- 6.6. Electricity Act, 2049 and Electricity Regulation, 2050
- 6.7. Electricity Regulatory Commission Act, 2074
- 6.8. Good Governance (Management and Operation) Act, 2064
- 6.9. National Water Resources Policy, 2075
- 6.10. Corruption Control Act, 2059
- 6.11. Land Acquisition Act, 2034
- 6.12. Environment Protection Act, 2076 and Environment Protection Regulation, 2077
- 6.13. Present Nepal Electricity Authority, Electricity distribution bylaws
- 6.14. Hydropower development policy, 2058
- 6.15. Labor act, 2074 and Labor Regulation, 2074

7. Power Sector Development in Nepal

- 7.1. Energy Supply & Demand - trend and challenges
- 7.2. Power Sector Development - history, generation structure, challenges and prospects
- 7.3. Private sector's participation in hydropower and Solar generation
- 7.4. Power Development Agreement (PDA), Power Purchase Agreement (PPA), licensing, feasibility study, Detail Engineering Design
- 7.5. Role of community electrifications and AEPC in public access to electricity
- 7.6. Nepal Electricity Authority: Corporate structure, functions of different business groups, NEA's Subsidiary & Associate Companies, objective, achievement and challenges
- 7.7. Concept of NEA Restructuring in federal context, Operational Performance
- 7.8. Various model of Investment for Hydropower development
- 7.9. Corporate Development Plan (CDP) of NEA

8. New Trends of Power Sector

- 8.1. Energy security, present and future energy mix scenario of : (1) Nepal, (2) Bilateral: BBIN, SAARC and (3) The world
- 8.2. Global efforts and achievements on Energy Efficiency, energy intensity
- 8.3. UN Initiatives on Sustainable and renewable energy promotion

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- 8.4. Concept of Energy banking, Energy Trading, Energy Exchange and Regional Grid, International Energy market trends
- 8.5. Financial & Technical Aspects of Cross Border Grid Connectivity
- 8.6. Recent international practices in power sector reform; Energy wheeling charge, Energy pool market, Availability based tariff

9. Grid Operation

- 9.1. Management of Active/Reactive power in complex system-challenges and opportunities for management
- 9.2. Power system stability – Issues and challenges
- 9.3. Control and protection: Importance, trends and challenges in complex electrical systems

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पाठ्यक्रम
द्वितीय पत्र
सेवा सम्बन्धी विस्तृत ज्ञान
खण्ड (क) : ५५ अङ्क

1. **Hydrology**
 - 1.1 Hydrologic cycle, surface runoff and infiltration
 - 1.2 Occurrence and types of surface and ground water
 - 1.3 Surface and ground water movement
2. **Project Engineering and Optimization Study**
 - 2.1 Power market survey; Load demand forecast and determination of capacity requirement; Site selection; Different stages of project Development
 - 2.2 Field investigations and study : Reconnaissance survey, Topographical survey, Hydrological investigation, Sedimentological investigation, Geological investigation, Sub-surface exploration, Seismological studies, Material investigation, Landslide hazard mapping
 - 2.3 Flood study: Pre-monsoon flood and Maximum flood, Landslide Dam outburst flood, Glacier Lake outburst flood
 - 2.4 Project preparation for implementation and justification of the Project
 - 2.5 Types of Hydropower Projects
 - 2.6 Optimization Study: Power optimization; Determination of load factor, utilization factor and plant capacity factor; Firm energy and secondary energy; Reservoir and Peaking Run-off-River Projects and their importance for run-off-river schemes
3. **Overall Design of Hydro-Electric Projects**
 - 3.1 General layout of hydraulic structures
 - 3.2 Overview of water conveyance structures
 - 3.3 Selection of surface structures and underground structures
 - 3.4 General arrangement of electrical and mechanical installations
 - 3.5 Output and capacity of the plant
 - 3.6 Optimization of water conveyance system
 - 3.7 Economic diameter of penstock
 - 3.8 Overview of Power House
 - 3.9 Power House Design and Planning
 - 3.10 Relationship between Dam and Adjacent Power House
 - 3.11 Reservoirs
 - 3.12 Downstream water release
 - 3.13 Fish passage facilities
 - 3.14 Cascade Development
 - 3.15 Economic Parameters
 - 3.16 Initial Environmental Examination and Environmental Impact Assessment
4. **Design of Dams and its Structures**
 - 4.1 Overview and design of different Types of dams (Embankment, Concrete, Roller Compacted (RCC) and Rock-Filled Concrete (RFC))
 - 4.2 Factor affecting on selection of economic dam site
 - 4.3 Factors affecting on design & constructions in different types of dams
 - 4.4 Floods and their economic aspects
 - 4.5 Spillway capacity

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- 4.6 Economic height of dam
 - 4.7 Stability analysis of dams
 - 4.8 Concept of gravel core rock filled dam
 - 4.9 Familiar with International Commission on Large Dams (ICOLD) guidelines
 5. **Economic Analysis of Hydro-electric Projects and Cost of electric Power**
 - 5.1 Economic and Financial analysis and justify the project development
 - 5.2 Plant capacity in relation to the stream flow
 - 5.3 Investment models in Hydropower development in Nepal
 - 5.4 Cost of electric Power:
 - 5.4.1 Size and cost optimization of hydro, solar and wind projects
 - 5.4.2 Effect of size on operation and management costs
 - 5.4.3 Unproductive capital and its effect on the cost of Power
 - 5.4.4 Different annual cost associated for effective operation
 - 5.4.5 Consumer tariff fixation
 - 5.4.6 Levelized cost of electricity
 6. **Design of Poles**
 - 6.1 RCC Poles: (Single and Multi Fold)
 - 6.2 Steel Pole: (Single and Multi Fold)
 - 6.3 Mono Pole: (Single and Multi Fold)
 7. **Multi-Purpose Hydropower Projects**
 - 7.1 Multi-purpose hydropower projects and their planning
 - 7.2 Benefits of Multipurpose Hydropower Projects
 - 7.3 Benefits of river basin development
 - 7.4 Special considerations for Multi-Purpose Hydropower Projects
 - 7.5 Reservoir Routing and its Significance
 8. **Storage and Related Economic Problems**
 - 8.1 Cost of Storage
 - 8.2 Minimum dry weather flow
 - 8.3 Consequences of short supplies
 - 8.4 Re-regulating Dam, importunate in storage project and its cost
 - 8.5 Cost sharing mechanism on regulated discharge
- खण्ड (ख) : ४५ अङ्क**
9. **Reservoirs - Problems of Sedimentation**
 - 9.1 Control of Sedimentation
 - 9.2 Evaluation of effect of Sedimentation on Power Production
 - 9.3 Management of Sedimentation in Reservoir
 - 9.4 Soil conservation
 - 9.5 Effect of dams on river regime
 - 9.6 Mechanism of reservoir silting
 - 9.7 Method of desilting of reservoir
 10. **Maintenance of Civil Engineering Works**
 - 10.1 Maintenance and its requirement
 - 10.2 Maintenance process: Operation manual, As-built Drawing, Condition Monitoring of Structure, Retrofitting Process

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- 10.3 Scheduling and programming of preventive maintenance
- 10.4 Maintenance squad
- 10.5 Maintenance Manual and its significance
- 10.6 Maintenance of: Reservoirs, Dams and spillways, Canals and forebays, Tunnels, Pipelines, Power House, Under Water Civil Works
11. **Safety Engineering**
 - 11.1 Safety rules and regulations
 - 11.2 Storage and handling of explosives, compressed gases and inflammable substances
 - 11.3 Safety precautions in handling electrical installations in construction premises, earthing and shielding techniques
 - 11.4 Water Induced Hazards and its management
 - 11.5 Disaster Management Plan in Hydropower Project
 - 11.6 Fire hazards, firefighting techniques and equipment
 - 11.7 Noise hazards, its sources, effect on health and control
 - 11.8 First aid requirements in case of health hazard
 - 11.9 Field instrumentation and warning systems
 - 11.10 Climate change and its impact in Nepalese Hydropower
12. **Contract Management**
 - 12.1 Preparation of contract documents, specifications, condition of contract and other contractual procedures
 - 12.2 Familiarization with procurement guidelines and standards of PPMO Nepal, World Bank & Asian Development Bank (WB & ADB)
 - 12.3 Standard Bidding Document for ICB including for EPC contract, Standard Bidding Document for NCB including for EPC contract
 - 12.4 Settlement of contractual disputes (mediation, arbitration and negotiation)
13. **Engineering Economics and Project Scheduling**
 - 13.1 Disbursement schedule, Cash flow analysis, Time value of money
 - 13.2 Project evaluation indicators, NPV, IRR, RoE, Payback period, (EIRR, FIRR), CB/BC Ration and others Criterion, Choose the best alternative
 - 13.3 Incremental, sensitivity & breakeven analysis
 - 13.4 Risk analysis, Inflation & price change
 - 13.5 Financing of projects
 - 13.6 Taxation system in Nepal, issues and challenges for investments in power projects in Nepal
 - 13.7 Electricity tariff schemes, factors affecting electricity tariff, subsidy/cross subsidy issues in tariff designing and regulatory issues
 - 13.8 Concept of Project Scheduling
 - 13.9 Resource Planning & Management
 - 13.10 Analysis of Critical Path, CPM & PERT
14. **Quality Control**
 - 14.1 Need of Quality Control
 - 14.2 Mechanism of Quality Control: Type and Performance Test, Nano Technology in Quality Control
 - 14.3 Technical Auditing
 - 14.4 Quality Control Management

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- 14.5 Quality Assurance Plan
- 14.6 Accrediation and Calibration of Testing Equipment

15. **International Treaty and Conventions**

- 15.1 Koshi Agreement, Gandak Agreement and Electricity Exchange agreements
- 15.2 Treaty between the then Government of Nepal and Government of India concerning the integrated development of Mahakali River including Sarada Barrage, Tanakpur Barrage and Pancheswar Project
- 15.3 Trends and issues in Project Development Agreements (PDA) and Power Purchase Agreements (PPA)

16. **Service-Related Manuals**

- 16.1 Manual for public Involvement in Environmental Impact Assessment (EIA) process of Hydropower Projects
- 16.2 Manual for preparing Terms of Reference (TOR) for environmental Impact Assessment, (EIA) of Hydropower Projects
- 16.3 Manual for preparing Scoping Document for Environmental Impact Assessment (EIA) of Hydro power Projects
- 16.4 Manual for preparing Environmental Management Plan (EPM) for Hydropower Projects
- 16.5 National Environmental Impact Assessment Guidelines, 1993
- 16.6 Safety Guidelines and standards for Generation, Transmission and Distribution of Hydro Electricity
- 16.7 DoED Guideline for study of Hydropower Projects, 2018
- 16.8 DoED Power House Design Guidelines for Hydropower Projects, 2018
- 16.9 DoED Design Guidelines for water conveyance system of Hydropower Projects
- 16.10 DoED Design Guidelines for Headworks of Hydropower Projects