

नेपाल विद्युत प्राधिकरण
प्राविधिक सेवा, सबै समूह/उपसमूहको तह ८, सहायक प्रबन्धक पदको खुला/आन्तरिक प्रतियोगितात्मक परीक्षाको
लागि पाठ्यक्रम

पाठ्यक्रम योजनालाई निम्नानुसार दुई चरणमा विभाजन गरिएको छः

प्रथम चरणः	लिखित परीक्षा	पूर्णाङ्कः- २००
द्वितीय चरणः	अन्तर्वार्ता	पूर्णाङ्कः- ३०

परीक्षा योजना (Examination Scheme)

प्रथम चरणः लिखित परीक्षा

पूर्णाङ्कः- २००

पत्र	विषय	पूर्णाङ्क	उत्तिर्णाङ्क	खण्ड	परीक्षा प्रणाली	प्रश्न संख्या * अङ्कभार	समय
प्रथम	शासकीय प्रबन्ध, व्यवस्थापन र व्यवसायीकता	१००	४०	(क)	छोटो आउने प्रश्न	४ प्रश्न * ५ अंक	३ घण्टा
				(ख)	लामो आउने प्रश्न	३ प्रश्न * १० अंक	
					छोटो आउने प्रश्न	४ प्रश्न * ५ अंक	
				लामो आउने प्रश्न	३ प्रश्न * १० अंक		
द्वितीय	सेवा सम्बन्धी (विस्तृत ज्ञान)	१००	४०	(क)	तर्कयुक्त विश्लेषणात्मक प्रश्न	३ प्रश्न * १० अंक	३ घण्टा
				(ख)	समस्या समाधानमूलक प्रश्न	१ प्रश्न * २० अंक	
					तर्कयुक्त विश्लेषणात्मक प्रश्न	३ प्रश्न * १० अंक	
				समस्या समाधानमूलक प्रश्न	१ प्रश्न * २० अंक		

द्वितीय चरणः अन्तर्वार्ता

पूर्णाङ्कः- ३०

विषय	पूर्णाङ्क	परीक्षा प्रणाली
अन्तर्वार्ता	३०	मौखिक

द्रष्टव्यः

- लिखित परीक्षाको माध्यम भाषा नेपाली र अंग्रेजी अथवा नेपाली अंग्रेजी दुवै हुन सक्नेछ।
- प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ।
- लिखित परीक्षामा सोधिने प्रश्नसंख्या र अंकभार यथासम्भव सम्बन्धित पत्र/विषयमा दिईए अनुसार हुनेछ।
- विषयगत प्रश्नहरूको हकमा एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more Parts of a single question) एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरू (Short notes) सोध्न सकिनेछ।
- विषयगत प्रश्न हुने पत्र/विषयमा प्रत्येक खण्डका प्रश्नका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन्। परीक्षार्थीले प्रत्येक खण्डका प्रश्नको उत्तर सोही खण्डको उत्तरपुस्तिकामा लेख्नु पर्नेछ।
- 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 परेको सम्झनु पर्नेछ।
- प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराईनेछ।
- पाठ्यक्रम स्वीकृत मिति:- २०८०/०८/२१

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प्रथमपत्र

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

खण्ड (क) : ५० 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

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

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, Stress management, Participative management, Disaster Management
- 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. Project management:
 - 3.7.1. Project Planning and Scheduling: Network models-CPM/PERT, Human resource planning and resource scheduling, Project preparation for implementation and justification
 - 3.7.2. Project monitoring and control: System of control, Project control cycle, Feedback control systems, Cash control
 - 3.7.3. 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
- 3.8. Management Information system (MIS) and Enterprise Resource Planning (ERP)

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. Challenges of corruption and corruption control strategies
- 4.5. Accountability, responsibility and authority
- 4.6. Compliance mechanism of public accountability

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- 5. Professionalism :** The foundational values for public service - integrity, impartiality, dedication, empathy, tolerance and compassion

खण्ड: (ख) : ५० 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

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. Nepal Electricity Authority: Corporate structure, functions of different business groups, NEA's Subsidiary & Associate Companies, objective, achievement and challenges
- 7.6. Concept of NEA Restructuring in federal context, Operational Performance
- 7.7. Various model of Investment for Hydropower development
- 7.8. 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. Concept of Energy banking, Energy Trade, Energy Exchange and Regional, Grid International Energy market trends
- 8.4. Financial & Technical Aspects of Cross Border Grid Connectivity
- 8.5. 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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द्वितीय पत्र
सेवा सम्बन्धी विस्तृत ज्ञान
खण्ड (क) : ५० 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 RCC Poles: (Single and Multi Fold)**
- 7. Engineering Economics**
 - 7.1 Disbursement schedule, Cash flow analysis, Time value of money
 - 7.2 Project evaluation indicators, NPV, IRR, RoE, Payback period, (EIRR, FIRR), CB/BC Ratio and others Criterion, Choose the best alternative
 - 7.3 Financing of Project
 - 7.4 Energy tariff schemes and regulatory issues and different directives
- खण्ड (ख) : ५० अङ्क**
- 8. Multi-Purpose Hydropower Projects**
 - 8.1 Multi-purpose hydropower projects and their planning
 - 8.2 Benefits of Multipurpose Hydropower Projects
 - 8.3 Benefits of river basin development
 - 8.4 Special considerations for Multi-Purpose Hydropower Projects
 - 8.5 Reservoir Routing and its Significance
- 9. Storage and Related Economic Problems**
 - 9.1 Cost of Storage
 - 9.2 Minimum dry weather flow
 - 9.3 Consequences of short supplies
 - 9.4 Re-regulating Dam, importunate in storage project and its cost
 - 9.5 Cost sharing mechanism on regulated discharge
- 10. Reservoirs - Problems of Sedimentation**
 - 10.1 Control of Sedimentation
 - 10.2 Evaluation of effect of Sedimentation on Power Production
 - 10.3 Management of Sedimentation in Reservoir
 - 10.4 Soil conservation
 - 10.5 Effect of dams on river regime
 - 10.6 Mechanism of reservoir silting
 - 10.7 Method of desilting of reservoir

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11. Maintenance of Civil Engineering Works

- 11.1 Maintenance and its requirement
- 11.2 Maintenance process: Operation manual, As-built Drawing, Condition Monitoring of Structure, Retrofitting Process
- 11.3 Scheduling and programming of preventive maintenance
- 11.4 Maintenance squad
- 11.5 Maintenance Manual and its significance
- 11.6 Maintenance of: Reservoirs, Dams and spillways, Canals and forebays, Tunnels, Pipelines, Power House, Under Water Civil Works

12. Safety Engineering

- 12.1 Safety rules and regulations
- 12.2 Storage and handling of explosives, compressed gases and inflammable substances
- 12.3 Safety precautions in handling electrical installations in construction premises, earthing and shielding techniques
- 12.4 Water Induced Hazards and its management
- 12.5 Disaster Management Plan in Hydropower Project
- 12.6 Fire hazards, firefighting techniques and equipment
- 12.7 Noise hazards, its sources, effect on health and control
- 12.8 First aid requirements in case of health hazard
- 12.9 Field instrumentation and warning systems
- 12.10 Climate change and its impact in Nepalese Hydropower

13. Contract Management

- 13.1 Preparation of contract documents, specifications, condition of contract and other contractual procedures
- 13.2 Familiarization with procurement guidelines and standards of PPMO Nepal, World Bank & Asian Development Bank (WB & ADB)
- 13.3 Standard Bidding Document for ICB including for EPC contract, Standard Bidding Document for NCB including for EPC contract
- 13.4 Settlement of contractual disputes (mediation, arbitration and negotiation)

14. Project Scheduling

- 14.1 Concept of Project Scheduling
- 14.2 Resource Planning & Management
- 14.3 Analysis of Critical Path, CPM & PERT

15. Quality Control

- 15.1 Need of Quality Control
- 15.2 Mechanism of Quality Control: Type and Performance Test, Nano Technology in Quality Control
- 15.3 Technical Auditing
- 15.4 Quality Control Management
- 15.5 Quality Assurance Plan
- 15.6 Accrediation and Calibration of Testing Equipment

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16. International Treaty and Conventions

- 16.1 Koshi Agreement, Gandak Agreement and Electricity Exchange agreements
- 16.2 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
- 16.3 Trends and issues in Project Development Agreements (PDA) and Power Purchase Agreements (PPA)

17. Service-Related Manuals

- 17.1 Manual for public Involvement in Environmental Impact Assessment (EIA) process of Hydropower Projects
- 17.2 Manual for preparing Terms of Reference (TOR) for environmental Impact Assessment, (EIA) of Hydropower Projects
- 17.3 Manual for preparing Scoping Document for Environmental Impact Assessment (EIA) of Hydro power Projects,
- 17.4 Manual for preparing Environmental Management Plan (EPM) for Hydropower Projects
- 17.5 National Environmental Impact Assessment Guidelines, 1993
- 17.6 DoED Guideline for study of Hydropower Projects, 2018
- 17.7 DoED Power House Design Guidelines for Hydropower Projects, 2018
- 17.8 DoED Design Guidelines for water conveyance system of Hydropower Projects
- 17.9 DoED Design Guidelines for Headworks of Hydropower Projects