



औद्योगिक क्षेत्र व्यवस्थापन लिमिटेड

(नेपाल सरकारको स्वामित्व भएको)

प्राविधिक सेवा, ईन्जिनियरिङ्ग समूह/ईलेक्ट्रीकल उपसमूह सहायक निर्देशक (प्रा.) तह-८ पदको
खुला र आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

यो पाठ्यक्रमलाई देहाय अनुसार दुई चरणमा विभाजन गरिएको छः

(१) प्रथम चरण लिखित परीक्षा: पूर्णाङ्क २००

(२) द्वितीय चरण अन्तरवार्ता: पूर्णाङ्क ३०

परीक्षा योजना (Examination Scheme)

१. प्रथम चरण: लिखित परीक्षा

पत्र	विषय	पूर्णाङ्क	उत्तीर्णाङ्क	खण्ड	परीक्षा प्रणाली	प्रश्न संख्या	प्रति प्रश्न अङ्कभार	समय
प्रथमपत्र	शासकीय प्रबन्ध, व्यावसायिकता र सेवा सम्बन्धी सामान्य ज्ञान	१००	४०	(क) शासकीय प्रबन्ध, व्यवस्थापन र व्यवसायिकता	छोटो उत्तर दिने प्रश्न	१०	५	३ घण्टा
				(ख) सेवा सम्बन्धी सामान्य विषय	लामो उत्तर दिने प्रश्न	५	१०	
द्वितीयपत्र	सेवा सम्बन्धी ज्ञान	१००	४०	विश्लेषणात्मक समीक्षा		४	१५	३ घण्टा
				विश्लेषणात्मक र समाधान मुलक उत्तर		२	२०	

२. द्वितीय चरण: अन्तरवार्ता

विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	समय
व्यक्तिगत अन्तरवार्ता	३०	-	मौखिक	-

द्रष्टव्यः

- लिखित परीक्षाको माध्यमभाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजीदुवै हुन सक्नेछ ।
- प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
- लिखित परीक्षामा यथा सम्भव पाठ्यक्रमका सबै एकाईबाट प्रश्नहरु सोधिनेछ ।
- विषयगत प्रश्नहरुको हकमा एउटा लामो प्रश्नवा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग(Two or more parts of single question)वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरु (Short notes) सोध्न सकिनेछ ।
- विषयगत प्रश्नहुने पत्र/विषयको प्रत्येक भाग/खण्ड/इकाई प्रश्नका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरु हुनेछन् । परीक्षार्थीले प्रत्येक भाग खण्ड/इकाई/प्रश्नको उत्तर सोही भाग/खण्ड/इकाई प्रश्नको उत्तरपुस्तिकामा लेख्नु पर्नेछ ।
- यस पाठ्यक्रममा जे सुकै लेखिएको भएतापनि पाठ्यक्रममा परेका कानून, ऐन,नियम, विनियम तथा नीतिहरु परीक्षाको मितिभन्दा ३ महिना अगाडि (संशोधनभएका वा संशोधन भई हटाईएका वा थप गरी संशोधनभई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।
- पाठ्यक्रम लागू मिति: २०७८।०३।०७ गते ।



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प्रथमपत्र:

खण्ड (क) शासकीय प्रबन्ध, व्यवस्थापन र व्यावसायिकता

(Governance, Management and Professionalism)

(50 Marks)

1. Governance

- Meaning, features and dimensions of governance.
- Existing Constitution of Nepal.
- The federal, provincial and local level governance.

2. Public Administration

- Concept of Public Administration.
- Basics elements of Personnel Administration.
- Financial Administration: Budget Preparation, Implementation, Monitoring and Evaluation
- Public Policy: Formulation, Implementation, Monitoring and Evaluation.

3. Management and Financial Analysis

- Contemporary issues and Emerging concept of management.
- Role and Importance of Leadership, Motivation, Team work, Decision making, Control and coordination in Management.
- Corporate planning and strategic management.
- Corporate social responsibility.
- 3.5. Project management: Project Planning and Scheduling: Network models, CPM/PERT, Manpower planning and resource scheduling, Project preparation for implementation and justification, 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.
- Management Information system.
- Issues and Challenges of Human Resource Management in Public Enterprises of Nepal.
- 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; Concept of EIRR and FIRR; tariff structure.

4. Development

- Concept of development administration.
- People's participation in development.
- Planning in Nepal: efforts, achievement and challenges.
- Sustainable Development.
- Diversity Management.
- Public Private Partnership.
- Industrial District Management Limited: objective, achievement and challenges.

5. Ethics, morality and Accountability

- Essence, determinants and dimensions of ethics.
- Human values.
- Ethical issues in public service delivery and utilization of public funds.
- Challenges of corruption and corruption control Mechanism.
- Accountability, responsibility and authority.



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6. **Professionalism**

- The foundational values for public service - integrity, impartiality, dedication, tolerance and compassion.
- 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.
- Negotiation skills.
- Dispute settlement Mechanism.

खण्ड (ख): सेवा सम्बन्धी ज्ञान

(Service Related General Issues)

50 Marks

1. **Service Related Policy, Act and Regulations**

- Industrial Policy of Government of Nepal, 2067.
- Industrial Enterprise Act, 2073.
- Industrial District Management Limited Electricity Regulation, 2059(Amended).
- Industrial District Management Limited Financial Regulation, 2050(Amended).
- Industrial District Operation and Management Regulation,2071,(Amended)
- Electricity Regulatory Commission Act, 2074.
- Electricity Act, 2049 and Regulation, 2050.
- Public Procurement Act, 2063 and Regulation, 2064.
- Prevention of Corruption Act, 2059.
- Electricity Theft Control Act, 2058 and Regulation, 2059.
- Company Act, 2063.

2. **Industrial and Electricity Development in Nepal**

- Energy Supply & Demand- trend and challenges.
- Industrial and Power Sector Development - history, generation structure, challenges and prospects.
- Role of Industrial District Management Limited.
- Various model of Investment for Industrial development.
- Alternative Renewable Energy: status and possibilities.

3. **New Trends of Power Sector**

- Various Sources of Energy: trend, Possibilities and challenges.
- Privatization of Utilities.
- Power Purchase Agreement.
- Unbundling of Power System.
- Concept of Energy Pool Market.
- Energy Banking and its importance.



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द्वितीय पत्र: सेवा सम्बन्धी ज्ञान

खण्ड क:

(२५=३०) र(१२०=२०) — ५० अङ्क

1. Electrical Engineering Fundamentals

- Active, reactive and apparent power computations, power factor, power factor improvement.
- Three phase systems; balanced and unbalanced systems, voltage current relations and computation of power in three phase systems.
- Automatic feedback control system; Sensors and transducers time and frequency response, stability criterion.
- Power electronics devices; Diode, power transistors.
- Switched mode DC-AC and AC-DC converters, Sinusoidal PWM.
- AC-AC Converters: Single-phase AC regulator; Three-phase AC regulators.
- Basics of Flexible AC transmission systems (FACTS).
- Energy efficiency and energy Audit.

2. Electrical Machines

- 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.
- Induction Machines: Construction, Operating Characteristics, Losses and efficiency, Starter and speed control of induction motor, Induction generator controllers and harmonics, selection of induction machines.
- DC Machines: Construction, Characteristics, Losses and efficiency, Armature reaction, Starter and speed regulation of motors, Applications.

3. Power Plant

- Hydroelectric Power Plants: Merits and demerits; site selection; classification; elements of hydroelectric power plant and schematic layouts; different types of water turbines; efficiency curves; selection of water turbines; essential features of hydroelectric alternators; choice of size and number of generating units; auxiliaries in hydroelectric plant; Nepalese power plants, their types, salient features and locations. Governing mechanism
- Diesel Electric Power Plants: Merits and demerits; application; site selection; elements of a diesel plant and its schematic arrangement; performance and thermal efficiency.
- Renewable energy technology: solar photovoltaic, wind and geothermal method of power generation and their importance, grid interconnection of renewable energy.
- Plant factor; utilization factor and plant use factor; significance of load factor and diversity factor in generation planning.

4. Power Transmission and Distribution System

- Transmission Systems: Choice of voltage, Surveying, Route selection, Right of way, advantages and limitations of HVDC lines.
- Performance analysis of transmission lines, Surge impedance and surge impedance loading, Proximity effect, skin effect.



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- c. Principles of power system protection, Protection system components, Disconnecting switches and contactors, Types and characteristics of circuit breakers and protective relays, Automatic reclosure.
- d. Protection of generators, transformers and transmission/distribution lines.
- e. Distribution system layouts, Radial, loop and ring distribution system, primary and secondary voltage selection criterion, overhead and underground distributions.
- f. Substation layout and location, Bus bar schemes.
- g. Urban and rural distribution; scope of renewable energy for rural electrification.
- h. Consumer Load Characteristics, Concept of load curve; load duration curve; demand factor; Small area load forecasting methods.
- i. Underground Cable; classification, cable resistances and capacitances, insulation resistance, selection of cable, handling of cable and protection, cable joints.
- j. Substation layout and location, Bus bar schemes.
- k. Load Forecasting, Small area load forecasting methods, Techniques, Distribution Transformer selections.
- l. Distributions System Load Flow techniques, unbalancing load cases.
- m. Distribution system loss reduction techniques and Voltage drop control methods, distribution reconfigurations, optimal capacitor placements in primary distribution systems.

5. Power System Analysis

- a. Load flow study: N-R and DC Load flow methods.
- b. Symmetrical and unsymmetrical faults in power system, Fault calculations in integrated power system.
- c. Power system stability: Steady state, dynamic and transient stability, Equal area criterion.
- d. Load dispatching: Principle of economic load dispatch, requirements, tools and role of dispatcher, Rationale and tools of demand side management.
- e. Real power/frequency balance, Reactive power/ Voltage balance.

6. High Voltage Engineering

- a. Corona phenomenon: Factors affecting corona and its disadvantages; corona loss, audible noise and radio interference.
- b. Inductive interference between power and communication lines.
- c. External and internal over voltages; temporary, switching and lightning over voltage computations, sub synchronous resonance and Ferro resonance.
- d. Factors affecting the different types of over voltages and controlling the over voltages.
- e. Insulation coordination and insulator design for transmission line, transformers and cables.
- f. Characteristics and suitability of different types of surge arrestors.
- g. Insulation withstand tests, Generation of high AC, DC and impulse voltage for testing.

खण्ड (ख) :

(२५१५=३०, १५२०=२०)–५०अङ्क

1. Engineering Economics

- a. Disbursement scheduling, Cash flow analysis, Time value of money.
- b. Project evaluation indicators, IRR, Payback period and others Criterion for capital investment decision.
- c. Risk analysis, Inflation & price change.
- d. Taxation system in Nepal.



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e. Energy tariff and regulatory issues.

2. **Safety Engineering**

Effects of non-ionizing magnetic fields on human body, Physical effect of electric shock, Safety considerations, Live line maintenance, Earthing and shielding technique.

3. **Contract Management**

- Preparation of contract documents, specifications, condition of contract and other contractual procedures.
- Familiarization with Procurement guidelines and standards of World Bank & Asian Development Bank (WB & ADB).
- International Standard Bidding Document, National Standard Bidding Document
- Arbitration.

4. **Financial and Marketing Management:**

- Marketing strategies- product/service, pricing & promotion.
- Customer relation management –concept, roles and functions.
- Marketing management issues and challenges.
- Financial planning/budgeting.
- Working capital management, Inventory control management.
- Material management, Financial audit, Performance audit.

5. **Project Management**

- Concept of project planning and management and processes.
- Recent project planning approaches.
- Project cycle, Linkages between plans.
- Program and projects, Project feasibility study – demand/need forecasting and analysis.
- Technical analysis and economic analysis.
- Environmental analysis, Project planning matrix- logical framework, project appraisal and screening, Project risk factors and mitigation, Contract negotiation, Project implementation plan (PERT, CPM, Network diagram, Gantt Chart), Basics of procurement of goods, services and works, Project proposal & reporting.

6. **Service Related Manuals/Test and others**

- National Environmental Impact Assessment Guidelines, 1993.
- Safety Guidelines and standards for Generation, Transmission and Distribution of Electricity.
- Role of Government institutions involved in Industrial and power sector development.
- Coordination between stakeholders in power sector, Scope for export oriented development of power sector.
- IEC Standards for transformer test, cable test, insulation withstand test.

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