

नेपाल टेलिकम
नेपाल दूरसंचार कम्पनी लिमिटेड
अधिकृतस्तर तह ७, प्राविधिक सेवा, टेलिकम ईन्जिनियरिङ समूह, इलेक्ट्रिकल उपसमूह, इलेक्ट्रिकल ईन्जिनियर पदको खुला तथा समावेशी र आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

पाठ्यक्रमको रूपरेखा :- यस पाठ्यक्रमको आधारमा निम्नानुसार चरणमा परीक्षा लिइने छ :

प्रथम चरण :- लिखित परीक्षा

पूर्णाङ्क :- २००

द्वितीय चरण :- अन्तर्वार्ता

पूर्णाङ्क :- ३०

परीक्षा योजना (Examination Scheme)

१. प्रथम चरण : लिखित परीक्षा (Written Examination)

पूर्णाङ्क :- २००

पत्र	विषय	खण्ड	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	प्रश्नसंख्या × अङ्क	समय
प्रथम	General Subject	General Awareness & General Ability Test	१००	४०	वस्तुगत बहुवैकल्पिक प्रश्न (MCQ)	५० प्रश्न × १ अङ्क = ५०	४५ मिनेट
		Management & Institutional Awareness			विषयगत	१० प्रश्न × ५ अङ्क = ५०	१ घण्टा ३० मिनेट
द्वितीय	Technical Subject		१००	४०	वस्तुगत बहुवैकल्पिक प्रश्न (MCQ)	३० प्रश्न × १ अङ्क	३० मिनेट
					विषयगत	२ प्रश्न × ५ अङ्क ६ प्रश्न × १० अङ्क	२ घण्टा ३० मिनेट

२. द्वितीय चरण :

विषय	पूर्णाङ्क	परीक्षा प्रणाली	समय
व्यक्तिगत अन्तर्वार्ता	३०	मौखिक	

द्रष्टव्य :

- यो पाठ्यक्रमको योजनालाई प्रथम चरण र द्वितीय चरण गरी दुई भागमा विभाजन गरिएको छ ।
- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।
- प्रथम र द्वितीयपत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
- लिखित परीक्षामा सोधिने प्रश्न संख्या र अङ्कभार यथासम्भव सम्बन्धित पत्र/विषयमा दिईए अनुसार हुनेछ ।
- वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरूको गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २० प्रतिशत अङ्क कट्टा गरिनेछ । तर उत्तर नदिएमा त्यस बापत अङ्क दिइने छैन र अङ्क कट्टा पनि गरिने छैन ।
- वस्तुगत बहुवैकल्पिक हुने परीक्षामा परीक्षार्थीले उत्तर लेख्दा अंग्रेजी ठूलो अक्षर (Capital letter) A,B,C,D मा लेख्नुपर्नेछ । सानो अक्षर (Small letter) a,b,c,d लेखेको वा अन्य कुनै सङ्केत गरेको भए सबै उत्तरपुस्तिका रद्द हुनेछ ।
- बहुवैकल्पिक प्रश्नहरू हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।
- विषयगत प्रश्नमा प्रत्येक पत्र/विषयका प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन् । परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरूको उत्तर सोही खण्डका उत्तरपुस्तिकामा लेख्नुपर्नेछ ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भएतापनि 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 पर्दछ ।
- प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीयचरणको परीक्षामा सम्मिलित गराइनेछ ।
- पाठ्यक्रमलागु मिति :- २०७८।०४।०१

प्रथम पत्र (Paper I): General Subject

Section (A) : - General Awareness & General Ability Test (50% Marks)

1. **General Awareness and Contemporary Issues(25 ×1 Mark=25 Marks)**
 - 1.1 **Geography of Nepal and the World (5 Marks)**
 - 1.1.1 Continent, ocean, pole, latitude, longitude, time, distance, mountains, deserts, rivers, glaciers, lakes, climate, trade winds, monsoon.
 - 1.1.2 Physical, socio-cultural and economic geography, major natural resources and demography of Nepal.
 - 1.2 **History & Culture (5 Marks)**
 - 1.2.1 Major historical events of the World.
 - 1.2.2 Notable events, personalities and socio-cultural aspects of ancient, medieval and modern history of Nepal.
 - 1.2.3 Customs, traditions, values, religions, ethnicity, languages, cultures, arts, literature, music and heritages of Nepal.
 - 1.3 **Economic aspects of Nepal (5 Marks)**
 - 1.3.1 Economic indicators (economic growth, GDP, GNP, per capita income, remittance, foreign aid & investment)
 - 1.3.2 Infrastructures of development (agriculture, industry, trade, tourism, transportation, communication, health, electricity)
 - 1.3.3 Government planning and budgeting.
 - 1.4 **Governance & Organisations (5 Marks)**
 - 1.4.1 The Constitution of Nepal; federal, provincial and local governments
 - 1.4.2 General information on the UNO, WTO, ITU, WB, ADB, AIIB, SAARC & BIMSTEC.
 - 1.5 **Contemporary Issues (5 Marks)**
 - 1.5.1 Information on sustainable development, environment, pollution, climate change, biodiversity, demography, urbanization, science and technology.
 - 1.5.2 Recent advance and major achievements in telecommunication sectors.
 - 1.5.3 Major Events and Current Affairs of National and International Importance.
2. **General Ability Test (15 ×1 Mark = 15 Marks)**
 - 2.1 **Verbal and Non- Verbal Ability Test** (8×1 Marks = 8 Marks)
Jumble words, Coding-Decoding, Ranking Order Test, Direction and Distance Sense Test, Logical Reasoning, Statement and Conclusions, Series, Analogy, Classification, Matrix, Analytical Reasoning, Figure Formation and Analysis, Rule Detection, Water images, Mirror images, Cubes and Dice & Venn-diagram
 - 2.2 **Numerical Ability Test** (7×1 Marks = 7Marks)
Series, Analogy, Classification, Coding, Arithmetical reasoning/operation, Percentage, Ratio, Average, Loss & Profit, Time & Work, Data interpretation & Data verification

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तथा समावेशी र आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

3. Mathematics and Statistics (10 ×1 Mark = 10 Marks)

- 3.1 Function and Limit, Maxima and Minima, Differentiation and Integration and their interpretation, Equations of straight lines, circle, parabola, hyperbola, spheres, cylinders and cones, Linear differential equations (up to second order), Fourier series, Fourier Transforms, Fourier integral, inverse Fourier integral formula, odd and even function, Laplace transforms, Line, surface and volume integral, Taylor series, Zeros and Poles, Z-transforms
- 3.2 Introduction of statistics and descriptive statistics, Mean, Mode, Variance, Dispersion, Probability, Discrete random variables and probability distribution, continuous random variables and probability distributions, Samples, Sampling theorems, Linear regression, Population mean & sample mean and accuracy, pi & bar diagrams, error functions.

Section (B) : - Management and Institutional Awareness Test (50% Marks)

4. Management Concepts

(10 Marks)

- 4.1 Concept of Management, Modern approaches to management
- 4.2 Vision, Mission, Goal, Objectives, Targets, Strategies, Organization Structure, Authority and Power Delegation, Leadership, Control, Coordination, Motivation, Teamwork and Group Dynamics
- 4.3 Managing work force diversity and appreciative inquiry
- 4.4 Quality management & TQM techniques
- 4.5 Time Management, Conflict Management, MIS, Customer Care, Decision Support System, Outsourcing, Inventory Control, Job Description, training, service portfolio and tariff structure of Nepal Telecom.
- 4.6 Corporate and strategic planning and management, corporate social responsibility,
- 4.7 Ethics, Integrity and responsibility in business/service like institution

5. Project Management & Marketing

(10 Marks)

- 5.1 Definitions, the project life cycle, Setting project objectives & goals, Network model: CPM & PERT, Gantt Chart, Project scheduling, Resource leveling, Systems of project control, Cost control, Preparation of operational budget, Introduction to budgetary control, Planning of quality, time & cost dimensions, Negotiating for Materials, Supplies & Services, project monitoring and evaluation, Bringing the project to a successful conclusion.
- 5.2 Concept of EIRR(Economic internal rate of return) and FIRR(Financial internal rate of return)
- 5.3 Business Strategic planning, Marketing Process, Product Planning, Developing the Marketing Program

6. Finance and General Accounting Principles

(10 Marks)

- 6.1 Essential business & accounting terminology, Cost classification & analysis, Interest & time value of money, Basic methodology of engineering economics, cost and benefit analysis, risk analysis, investment decisions, demand analysis and sales forecasting,

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6.2 Basic knowledge of trial balance & Balance Sheet, income statements, revenue and capital expenditure, budgeting and capitalization, depreciation and subsidy, Procurement procedures (FOB, CIF, Liquidated Damages, Letter of Credit, Insurance, Invoice, Bid Security, performance bond), Competitive bidding.

7. संस्थागत ज्ञान र सम्वद्ध कानूनहरु (20 Marks)

- 7.1 नेपाल दूरसंचार कम्पनी स्थापनाको उद्देश्य, संगठनात्मक संरचना, कार्यक्षेत्र र चुनौती
- 7.2 नेपाल दूरसंचार कम्पनी लिमिटेडको शेयर संरचना, vision, mission, goal, objectives, strategies
- 7.3 नेपाल दूरसंचार कम्पनी लिमिटेडले प्रवाह गर्ने सेवाका प्रकारहरु, अवलम्बन गरिएका प्रविधिहरु, सो को गुणस्तर, गुणस्तर नियन्त्रण तथा सेवाग्राहीको सन्तुष्टी तथा सेवाको मूल्य निर्धारण सम्वन्धी व्यवस्था
- 7.4 नेपाल दूरसंचार प्राधिकरणको स्थापना, लक्ष्य, उद्देश्य, कार्यहरु र नियमनकारी भूमिका
- 7.5 नेपाल दूरसंचार कम्पनी र नेपाल सरकार तथा सम्वद्ध निकायहरु संगको सम्वन्ध र समन्वय
- 7.6 दूरसंचार ऐन, २०५३ तथा दूरसंचार नियमावली, २०५४
- 7.7 नेपाल दूरसंचार कम्पनी लिमिटेडको प्रवन्धपत्र र नियमावली
- 7.8 नेपाल दूरसंचार कम्पनी लिमिटेडको कर्मचारी विनियमावली, २०७८ को विदा, आचरण तथा अनुशासन, सजाय र पूनरावेदन, अवकाश, उपदान, निवृत्तभरण तथा अन्य सुविधा
- 7.9 नेपाल दूरसंचार कम्पनी लिमिटेडको आर्थिक विनियमाली २०७९को भाग २ को खरिद सम्वन्धी कार्यविधि, भाग ३ को परिच्छेद (१) योजना तर्जुमा वार्षिक कार्यक्रम र बजेट, परिच्छेद(३) कम्पनीको सम्पत्तिको जिम्मा, त्यसको लगत, संरक्षण र वरबुझारथ सम्वन्धी व्यवस्था
- 7.10 कम्पनी ऐन, २०६३ को परिच्छेद २, ३ र ५
- 7.11 दूरसंचार नीति, २०६०
- 7.12 सूचना तथा सञ्चार प्रविधि नीति, २०७२
- 7.13 भ्रष्टाचार निवारण ऐन, २०५९

द्वितीय पत्र (Paper II): Technical Subject

Section (A) : - (50% Marks)

1. Basic Electricity

Electric current, EMF and Voltage, Resistance and Ohm's law, Basic circuit elements – Resistors, Capacitors, Inductors, Basic concepts on R-L-C Circuits, Delta/Star and Star Delta transformations, Kirchhoff's law, Electrical Circuit and Network theorems, Series and parallel circuits, Thevenin's equivalent circuit, Norton's equivalent circuit, Reciprocity theorem, Superposition theorem, Maximum Power transfer, Nodal and mesh method of network analysis, Millman's theorem, Magnetism and Electromagnetism.

2. AC Circuit Analysis

Generation of alternating voltage, average values, RMS values, RMS or effective values of any types of alternating voltage and current wave form, Phasor algebra, steady state response of circuits, Concept of admittance, reactance, instantaneous power, average real power, reactive power, resonance in series and parallel RLC circuit, bandwidth, effect of Q-factors in resonance.

3. Electric Machines

Magnetic circuit concepts: Ampere's laws, Faraday's laws, Lenz law, Ferromagnetic material, Hysteresis current, Hysteresis and eddy current losses, Basic concepts of Electrical machines: DC generators and motors, Alternators, Transformers, Synchronous and Induction motors, Controls of DC Machines in the Steady state, Insulating materials, conducting materials, superconductors, semiconductors, natural and forced cooling.

4. Power System Analysis

Power Generating Plants (Hydro, Gas, Diesel, Nuclear), Fundamentals of Transmission and Distribution Systems, Three Phase Power Systems (balanced, unbalanced), Power system Load Flow Calculation, Power systems Stability, transmission lines, advantages of three phase system, star and delta connected supply and load circuit, line and phase voltage current relations.

5. Renewable Energy: Concept of solar energy, solar power supply system, solar regulator

6. Industrial Electrification

Illumination, Design of Electrical Heating System, Electrical Installation Systems, Emergency and backup electrical supplies, Battery: Lead acid, Charging / Discharging characteristics, Difference between solar and conventional batteries, Deep discharge and battery life, Maintenance free batteries, Over voltage and under voltage protection of batteries, UPS, Self start Engines, Inverter, Thyristor controlled rectifier, Three phase Rectifier, DC/DC converter, SMPS, Voltage regulator, Materials Used in the Electrical Equipments, Power Cables, Electrical drawing, design and cost estimation.

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Section (B) : - (50% Marks)

7. Switchgear and protection

7.1 Principles of Power system Protection, Protective Relays, Types of Circuit Breakers

7.2 Generator Protection, Transformer Protection and Transmission Protection, Power/Frequency Control.

8. Instrumentation and Measurement

Principles of moving coil instrument, Measurement of voltage and current, various electrical measuring instruments: galvanometer, voltmeter, sensitivity of voltmeter, ammeter, ohmmeter, Megger, Earth resistance meter, multi-meter, and oscilloscope, Wheatstone bridge, inductance and capacitance bridges, probability of error and calibration.

9. Control System

Open loop and closed loop control system, System Stability and Sensitivity, System transfer functions and responses, Poles and Zeros locations and their significance, Root locus method, Frequency response method, Laplace transform method in solutions of differential equations, Ziegler-Nicholas tuning methods based controller tuning.

10. Safety Engineering

Electric Shock Hazards, Earthing and Shielding Techniques for electrical equipments, Electrical induction into communications lines, surge protection, Industrial radiation hazards, Lightning Protection

11. Basic Electronics

Diode, Zener diode, LEDs, Transistors, PNP, NPN, FET, MOSFETS, Op-Amps, Integrated circuits, NMOS, CMOS, MOSFET amplifiers, Junction field effect transistor, quadratic characteristics, JFET Amplifiers, The bipolar transistor and its configurations, Load line biasing in CE configuration, Number systems, power supplies & voltage regulators, Half wave rectifier, full wave rectifier, Bridge rectifier, Logic gates: AND, OR, NOT, NAND, NOR

12. Information and Communications Technology Basics

Computer architecture, Microprocessor fundamentals, Microcomputer systems: Bus structure, Memory systems (main, auxiliary, virtual, cache, I/O devices, parallel and serial interfaces, RS-232 standards, Flow charts, algorithms, variables, constants, data types, arithmetic expression, arrays, Concept of ROM, RAM, MS-DOS, Windows, MS-Office packages, basic concept on internet and e-mail.