

नेपाल टेलिकम
नेपाल दूरसंचार कम्पनी लिमिटेड
अधिकृतस्तर तह ७, प्राविधिक सेवा, टेलिकम ईन्जिनियरिङ समूह, सिभिल उपसमूह, ईन्जिनियर पदको खुला
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)**
 - 1.1.1Continent, ocean, pole, latitude, longitude, time, distance, mountains, deserts, rivers, glaciers, lakes, climate, trade winds, monsoon.
 - 1.1.2Physical, socio-cultural and economic geography, major natural resources and demography of Nepal.
 - 1.2 **History & Culture (5 Marks)**
 - 1.2.1Major historical events of the World.
 - 1.2.2Notable events, personalities and socio-cultural aspects of ancient, medieval and modern history of Nepal.
 - 1.2.3Customs, traditions, values, religions, ethnicity, languages, cultures, arts, literature, music and heritages of Nepal.
 - 1.3 **Economic aspects of Nepal (5 Marks)**
 - 1.3.1Economic indicators (economic growth, GDP, GNP, per capita income, remittance, foreign aid & investment)
 - 1.3.2Infrastructures of development (agriculture, industry, trade, tourism, transportation, communication, health, electricity)
 - 1.3.3Government planning and budgeting.
 - 1.4 **Governance & Organisations (5 Marks)**
 - 1.4.1The Constitution of Nepal; federal, provincial and local governments
 - 1.4.2General information on the UNO, WTO, ITU, WB, ADB, AIIB, SAARC & BIMSTEC.
 - 1.5 **Contemporary Issues (5 Marks)**
 - 1.5.1Information on sustainable development, environment, pollution, climate change, biodiversity, demography, urbanization, science and technology.
 - 1.5.2Recent advance and major achievements in telecommunication sectors.
 - 1.5.3Major 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

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,
- 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 कानुनहरु** (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 बिदा, आचरण तथा अनुशासन, सजाय र पूनरावेदन , अवकाश,उपदान,निवृत्तभरण तथा अन्य सुविधा

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अधिकृतस्तर तह ७, प्राविधिक सेवा, टेलिकम ईन्जिनियरिङ समूह, सिभिल उपसमूह, ईन्जिनियर पदको खुला
प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

- 7.9 नेपाल दुरसंचार कम्पनी लिमिटेडको आर्थिक विनियमाली २०७१को भाग २ को खरिद सम्बन्धी कार्यविधि, भाग ३ को परिच्छेद (१) योजना तर्जुमा वार्षिक कार्यक्रम र बजेट, परिच्छेद(३) कम्पनीको सम्पत्तिको जिम्मा, त्यसको लगत, संरक्षण र बरबुभारथ सम्बन्धी व्यवस्था
- 7.10 कम्पनी ऐन, २०६३ को परिच्छेद २, ३ र ५
- 7.11 दुरसंचार नीति, २०६०
- 7.12 सुचना प्रविधि नीति, २०६७
- 7.13 भ्रष्टाचार निवारण ऐन, २०५९

द्वितीय पत्र (Paper II): Technical Subject

Section (A) : - (50% Marks)

1. Structure Analysis and Design

- 1.1 Stresses and strains; theory of torsion and flexure; moment of inertia
- 1.2 Analysis of beams and frames: Bending moment, shear force and deflection of beams and frames: determinate structure - Energy methods; three hinged systems, indeterminate structures- slope deflection method and moment distribution method; use of influence line diagrams for simple beams, unit load method
- 1.3 Reinforced concrete structures: Difference between working stress and limit state philosophy, analysis of RC beams and slabs in bending, shear, deflection, bond and end anchorage, Design of axially loaded columns; isolated and combined footings, introduction to pre-stressed concrete
- 1.4 Steel and timber structures: Standard and built-up sections: Design of riveted, bolted and welded connections, design of simple elements such as ties, struts, axially loaded and eccentric columns, column bases, Design principles on timber beams and columns

2. Construction Materials and Concrete Technology

- 2.1 Properties of building materials: physical, chemical, constituents, thermal
- 2.2 Stones-characteristics and requirements of stones as a building materials
- 2.3 Ceramic materials: ceramic tiles, Mosaic Tile, brick types and testing
- 2.4 Cementing materials: types and properties of lime and cement; cement mortar tests
- 2.5 Metals: Steel; types and properties; Alloys
- 2.6 Timber and wood: timber trees in Nepal, types and properties of wood
- 2.7 Miscellaneous materials: Asphaltic materials (Asphalt, Bitumen and Tar); paints and varnishes; polymers
- 2.8 Indigenous Technology in Building Design and Construction
- 2.9 Constituents and properties of concrete (physical and chemical), Water cement ratio; Grade and strength of concrete, concrete mix design, testing of concrete; Mixing, transportation pouring and curing of concrete; Admixtures; High strength concrete; Pre-stressed concrete technology

3. Estimating and Costing Valuation and Specification

- 3.1 Types of estimates and their specific uses
- 3.2 Methods of calculating quantities
- 3.3 Key components of estimating norms and rate analysis
- 3.4 Preparation of bill of quantities
- 3.5 Purpose, types and importance of specification
- 3.6 Purpose, principles and methods of valuation

3.7 Variation, alteration and omissions

4. Drawing Techniques

- 4.1 Drawing sheet composition and its essential components
- 4.2 Suitable scales, site plans, preliminary drawings, working drawings etc
- 4.3 Theory of projection drawing: perspective, orthographic and axonometric projection; first and third angle projection
- 4.4 Drafting tools and equipments
- 4.5 Drafting conventions and symbols
- 4.6 Topographic, electrical, plumbing and structural drawings
- 4.7 Techniques of free hand drawing

5. Engineering Survey

- 5.1 Introduction and basic principles
- 5.2 Linear measurements: techniques; chain, tape, ranging rods and arrows; representation of measurement and common scales; sources of errors; slope and slope correction; chain and tape measurements; Abney level and clinometers
- 5.3 Compass and plane table surveying: bearings; types of compass; problems and sources of errors of compass survey; principles and methods of plane tabling
- 5.4 Leveling and contouring: Principle of leveling; temporary and permanent adjustment of level; bench marks; booking methods and their reductions; longitudinal and cross sectioning; reciprocal leveling; trigonometric leveling; contour interval and characteristics of contours; methods of contouring
- 5.5 Theodolite traversing: need of traverse and its significance; computation of coordinates; adjustment of closed traverse; closing errors
- 5.6 Uses of Total Station and Electronic Distance Measuring Instruments

6. Technology and Environment

- 6.1 Public procurement practices for works, goods and services and its importance
- 6.2 Technological development in Nepal.
- 6.3 Promotion of local technology and its adaptation
- 6.4 Environmental Impact Assessment, Initial Environmental Examination, Global-warming phenomena.
- 6.5 Types of sources of pollution: point / non-point (for air and water)
- 6.6 Social mobilization in local infrastructure development and utilization in Nepal.
- 6.7 Participatory approach in planning, implementation, maintenance and operation of local infrastructure

Section (B) : - (50% Marks)

7. Soil Mechanics

- 7.1 Properties of soils, Soil as a three phase diagram, Basic definitions of phase relationships, Index properties of soil, Determination of various index properties
- 7.2 Consolidation and settlements; Behavior of soil under compressive loads, Settlement of structures resting on soil: its nature, causes and remedial Measures, Primary and secondary consolidation, Compressibility of soil, Stability of slopes; Causes of slope movements and failures, Types of slope and slope failures, Critical surfaces and factor of safety, Method of stability analysis and stability number
- 7.3 Bearing capacity of soils; Types of bearing capacity and factors influencing bearing capacity, Effects of various factors on bearing capacity, Modes of foundation failure, Terzaghi's general bearing capacity theory, Ultimate bearing capacity of cohesionless and cohesive soil

8. Professional Practice

- 8.1 Ethics and Professionalism: Perspective on morals, codes of ethics and guidelines of professional engineering practice
- 8.2 Legal aspects of Professional Engineering in Nepal; Provision for private practice and employee engineers
- 8.3 Nepal Engineering Council Act, 2055 and regulations, 2056
- 8.4 Relation with clients, contractor and fellow professionals
- 8.5 Public procurement practices for works, goods and services and its importance

9. Applied Mechanics and Thermodynamics

Concept of equilibrium of particles, Force and position vectors, Conditions for equilibrium of a particle and a rigid body, Free body diagram, Moment of force and couple, Laws of friction, Simple trusses, Center of Gravity and Centroid, Moments of Inertia, Newton's laws and equation of motion, Translation, pure rotation and general plane motion of rigid body. Boyles and Charles law of gases, Zeroth, First and second law of thermodynamics, Introduction to Entropy and enthalpy, Viscosity, specific gravity, specific volume, bulk modulus, Turbulent and laminar flow, Configurations and characteristics of centrifugal pumps and blowers, Viscous flow, The Bernoulli energy equation, the momentum equation and their applications. Internal combustion Engine, Refrigeration Systems, Heat transfer, Types of heat transfer.

10. Basic Electricity

Circuit elements, series & parallel circuits, resistance, resistivity, Ohm's laws, Kirchoff's laws, Single phase & three phase circuit analysis,

Measurement of current, voltage, power, energy, insulation resistance, Primary & Secondary cells, Cells in series & parallel, star & delta connections, Fundamentals of transformers, Generators and Induction motors, Electrical shock hazards, Earthing and shielding techniques for telecom equipments, Lightning protections

11. 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.