नेपाल टेलिकम

(नेपाल दुरसंचार कम्पनी लिमिटेड)

प्राविधिक सेवा, टेलिकम ईन्जिनियरिङ्ग समुह, तह-८ , बरिष्ठ ईन्जिनियर पदको खुल्ला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

प्रथम पत्र :

समूह -क (Section A) - ऐन नियम, विनियम तथा नीतिहरु

समूह -ख (Section B) - व्यवस्थापन र सामान्य प्राविधिक ज्ञान (General Technical Knowledge) तथा समसायमयिक विषयहरु (Contemporary Issues)

Full Marks: 100 **Pass Mark: 40** **Time: 3 hours**

1. समूह -क (Section A) अन्तरगत निम्न अनुसार प्रश्न सोधिनेछ :

S. No.	Type of question	No. of Questions	Weightage/ question	Total Marks
1	Short Answer questions	4	5	20
2	Long Answer questions	2	10	20
	Total			40

Note: Only one short question shall be prepared for each topic group.

2. समूह -ख (Section -B) अन्तरगत निम्न अनुसार प्रश्न सोधिनेछ :

S. No.	Type of question	No of Questions	Weightage / question	Total Marks
1	Short Answer questions	6	5	30
2	Long Answer questions	3	10	30
	Total			60

Note:

- Only one short question shall be prepared for each topic group.
- There should be one long question for each of the topic group (General management, Project management/contemporary issues).
- One of the long questions should be Comprehensive type with problem presentation seeking answers on problem analysis and solutions.

समूह - क (Section- A) **पूर्णाङ्क -४०**

१. दूरसञ्चार सेवा सम्बन्धि नीति

- दूरसञ्चार नीति, २०६०
- सूचना तथा सञ्चार क्षेत्रको दिर्घकालिन नीति, २०५९
- सूचना प्रविधि नीति, २०६७
- रेडियो फ्रिक्वेन्सि नीति, २०६९
- VOIP को नियमन सम्बन्धी बिद्यमान व्यवस्था (Call Bypass, Grey market of VOIP)

२. दूरसञ्चार सेवा सम्बन्धि ऐन, नियम तथा विनियम

- नेपाल दूरसञ्चार कम्पनी लिमिटेडको प्रबन्ध पत्र
- नेपाल दूरसञ्चार कम्पनी लिमिटेडको नियमावली
- नेपाल दूरसञ्चार कम्पनी लिमिटेडको आर्थिक विनियमावली, २०७१
- नेपाल दूरसञ्चार कम्पनी लिमिटेडको कर्मचारी विनियमावली, २०६१
- सञ्चार संस्थान ऐन, २०२८
- दूरसञ्चार ऐन,२०५३ र दूरसञ्चार नियमावली २०५४
- विद्युतीय (इलेक्ट्रोनिक) कारोबार ऐन ,२०६३
- नेपाल ईन्जिनियरिङ्ग परिषद ऐन, २०५५ तथा आचार संहिता

३. आर्थिक कारोवार सम्बन्धि ऐन, नियम तथा विनियम

- सार्वजनिक खरिद ऐन,२०६४ र सार्वजनिक खरिद नियमावली, २०६४
- भ्रष्ट्राचार निवारण ऐन,२०५९
- मूल्य अभिवृद्धि कर ऐन, २०५३ र मूल्य अभिवृद्धि कर नियमावली

४. अन्य

- कम्पनी ऐन, २०६३
- उपभोक्ता संरक्षण ऐन, २०५४ तथा नियमावली
- सूचनाको हक सम्बन्धी ऐन, २०६४ र सूचनाको हक सम्बन्धी नियमावली, २०६४
- जग्गा प्राप्ति ऐन, २०३४
- आबश्यक सेवा सञ्चालन ऐन, २०१४

5. Telecom Development Organization, Regulators and operators

- International Agencies : ITU, APT, WTO - their major roles and relations with telecom operators, Network Readiness Index, Digitization Index
- UAO, USO, USF
- Telecom regulations : Regulatory Objectives, Sector Reform Initiatives in Nepal
- National Regulator: Nepal Telecom Authority (NTA) - Organization and functional role in sector development
- Major National Telecom Operators: Their Services and market Shares Comparative strengths and weaknesses

Section- B (समूह - ख) – **व्यवस्थापन र सामान्य प्राविधिक ज्ञान (General Technical Knowledge) तथा समसायमयिक विषयहरु (Contemporary Issues)**

पूर्णाङ्क -६०

1. Engineering Economics

- Capital Investment, Decision, Analysis and evaluation Techniques (NPV, IRR, PBP, PI)
- Life cycle management (MTTF/MTTR)
- Inventory management
- Depreciation, capitalization, amortization

2. General Management

- Roles and responsibilities of team leader
- Team building & synergy creation
- Delegation of Authority
- Management of time
- Problem solving and decision making
- Team Management
- Motivation
- Communication Skill & Interpersonal Relation
- Performance appraisal
- Staff discipline
- Total Quality management
- Industrial Relation/Peace
- Productivity Management

3. Project Management

- Concept of project planning and management
- Project goal setting
- Recent project planning approaches
- Project feasibility study- demand /need forecasting and analysis, Technical Analysis and economic analysis, environmental analysis
- Project scheduling
- Project life cycle
- Project Implementation plan (PERT, CPM, Network diagram, Gantt Chart)
- Project evaluation indicators/ techniques
- Project proposal & reporting, control & monitoring
- Basics of procurement of goods, services and civil works
- Contract negotiation

4. Marketing Management

- Marketing concept & Strategies- Product / service, Pricing & promotion & marketing channels
- Customer relationship Management- Concept, roles & functions Branding and its importance
- Competition, Competitive advantage, Competitor analysis
- Market demand and segmentation
- Service Marketing
- Marketing management issues and challenges of NT

5. Financial Management

- Capital Structure planning
- Budgeting and budgetary control
- Financial Statement and financial Ratio analysis
- Working Capital management
- Financial, Technical and Performance auditing

6. Risk Management

- Concept, Identification and Measurement
- Types of risks (Business, Project, System, Market)
- Risk Analysis and risk factors
- Techniques of managing risks
- Emergency management

7. Contemporary issues

- Current organization and management issues and challenges facing NT
- General Organizational structure of telecom company
- Outsource principle & current trend
- Media relationship management
- Inter- organizational relations
- Collective decision
- Other current issues

8. General technical knowledge

- Delivery of services using Smart phones
- Computers & related devices
- Software applications in Telecom
- Social media: its variant and benefits for tele marketing, customer support and market research
- Mobile banking and mobile commerce
- Design of ICT project for development of sectors (eg. Education, finance, HRD, telecommunication, Business, operations, security etc.)

द्रष्टब्य :

१. प्रश्नहरु अंग्रेजी तथा नेपाली दूवै वा कूनै एक भाषामा मात्र पनि सोध्न सकिनेछ ।

२. प्रश्नहरु सैद्धान्तिक, व्यवहारिक र बिश्लेषणात्मक किसिमबाट सोधिनेछन् ।

३. परीक्षार्थीहरुले अंग्रेजी वा नेपाली मध्ये कूनै एक वा दूवै भाषामा उत्तर दिन सक्नेछन् ।

४. प्रश्नहरुसंग सम्वन्धित ऐन, नीति, नियम तथा प्रचलित नेपाल कानूनहरु (नेपाल दुरसञ्चार कम्पनी लिमिटडसंग सम्वन्धित समेत) मा परीक्षा मिति भन्दा तीन महिना अघिसम्ममा संशोधन भई कायम रहेका व्यवस्था लागु हूनेछ ।

५. यथासम्भव सबै शिर्षकहरुलाई समेट्ने गरी प्रश्नहरु सोधिनेछन् ।

Nepal Telecom

Syllabus and Question pattern for Open Competition

Level: 8 **Post: Senior Engineer (Telecom)**

Group: Technical Subgroup: Engineering

Second Paper -Technical

Full Marks : 100 Pass Mark : 40

Time: 3 hours

S.No.	Type of question	Number of Questions	Weightage per question	Total Marks
1	Short Questions	12	5	60
2	Analytical and solution oriented	2	20	40
	Total			100

At least one question should be Comprehension type.

There should be questions seeking case study analysis.

Answers on problem resolutions should be divided in four parts as following.

a. Problem identification
b. Relate problem resolution with appropriate government & company rules and regulations
c. Strategies & Suggestions for problem resolutions
d. Methods for strategy implementation, monitoring and evaluation

Nepal Telecom

Level: 8 th Post: Senior Engineer

Group: Technical Sub Group: Engineering

A. Services

1. Introduction

1.1. General concept on National Telecommunication Planning
1.2. Importance of Telecommunication in National development
1.3. Social & Cultural aspects of Telecommunication
1.4. Relevance of global information network
1.5. Global trends in Telecom Development
1.6 Convergence of Services and Technologies

2. Telecom Services

2.1 Millennium Development Goals
2.2. Services demand & supply status in Nepal & SAARC Region
2.3. Services' Forecasting Methods
2.4. Key Performance Indicators of Services from Consumers Perspective
2.5 Telecommunication system analysis and planning
2.6. Numbering plan
2.7. Telecom Services' Charging & Billing Systems
2.8. Telecom business support systems (BSS)
2.9. VAS in telecom
2.10. Point of Interconnection & Interconnection services
2.11. Mediation services

B. Technologies

3. Telecommunication Systems and Engineering Design
3.1 Wireless systems
3.1.1 Satellite Communication
3.1.2. Microwave/Ultra High Frequency (UHF)
3.1.3. Cellular (GSM, CDMA, LTE)
3.1.4. Emerging technologies
3.2. Wire line systems
3.2.1 .PSTN
3.2.2. Optic fiber
3.2.3. LAN, WAN, MAN
3.2.4. Broadband Cable
3.2.5. Copper cable network

4. Voice systems

4.1.TDM based Transmission and Switching systems
4.2. Multiplexing techniques
4.3. Signaling & protocols
4.4. Alerting & supervision
4.5. Call traffic engineering (Erlang, grade of service, jitters, routing)

4.6. Network optimization

5. Data systems

5.1. IP Transmission systems
5.2. Digital Multiplexing
5.3. Broadband technologies –XDSL, ATM, SONET
5.4. VoIP, IPTV
5.5. Wireless broadband- WiMAX, Wi-Fi, Hotspot.2, EVDO, WCDMA, LTE
5.6. FTTH, EPON, GPON

6. Internet system

6.1. Internet and World Wide Web, Web .2, Web.3
6.2. Protocols used in network and applications
6.3. IPV4, IPV6
6.4. Privacy, security issues and security system

7. Digital Networks

7.1. Architecture
7.2. Network components
7.3. Framing-E1, STM
7.4. Channelization and signaling
7.5. Digital voice and video
7.6. Packet and Switched services-ATM, xDSL,
7.7. Encryption and security issues

8. Radio spectrum management

8.1. Spectrum management principles & Pricing
8.2. National spectrum management policies
8.3. Equipment Authorization and monitoring
8.4. Spectruim measurements and monitoring
8.5. General methodology for approval of transmitting and radiating equipment
8.6. Engineering spectral analysis and interference resolving

9. Power supply system

9.1 Basic Power supply in telecommunication
9.2. Basic rectifier principle
9.3. Type of rectifiers
9.4. Basic Generator principles
9.5. Solar power system
9.6. Battery Technologies, Power Systems and their dimensioning
9.7. Environmental Control Systems: air-condition, free cooling system, humidifier/ dehumidifier and their dimensioning to control operation and/ or life of the network components
9.8. Backup Power & Load shedding management
9.9. Alternative energy
9.10. Protection system- Earthing, lightening Arrestor / Surge protection
9.11. Green energy in telecom
9.12. Emerging Technologies

C. Operation, Maintenance & Quality Assurance

10. Network & service quality

10.1 Network Availability
10.2. Traffic Analysis & Monitoring reports
10.3. Network performance indicator
10.4. Development of efficiency indicators for operators
10.5. Quality of service in telecom services (basic telecom, mobile service, internet and VAS)
10.6. Number portability and its scope in service delivery
10.7. Telecom infrastructure sharing, principles, impact, benefits, readiness in Nepal

11. Operation& Maintenance

11.1. Structure for O&M, monitoring and support
11.2. Setting Objectives and key Indicators for O&M
11.3. Operation Support Systems (OSS)
11.4. Trouble ticketing, escalation of maintenance services
11.5. Safety and Maintenance of Telecom Networks
11.6. Fault analysis
11.7. Typical fault rates of network components & power equipments
11.8. Spares dimensioning basis & Inventory Control
11.9. Network operation centre- its role and importance
11.10. Customer Care Center- and its role& importance
11.11 Managed service outsourcing in telecom sector
11.12 Preventive & corrective maintenance

D. Information Systems Management

12.1 Types of information Systems, their importance in Telecom Sector

a) Management Information System
b) Decision Support System
c) Executive Information System
d) Enterprise Resource Planning (ERP) System
e) Database Management System

12.2. Information Security: Detection and Protection

a) Intrusion Detection Systems and approaches for defending
b) Types of Malicious software and defending against them
c) Information Security Policy and role of Information Security Officer

12.3. Business Analytics in Telecom Industry

a) Business Intelligence and its variances
b) Data model for Telecom Business

12.4. Data center management

a) Types of data centers
b) Major components of data center (power, air condition, building management system)
c) Low density and high density server racks
d) Data Warehouse and Data Mart
e) Cloud computing: Architecture & services- IaaS, SaaS, PaaS, DaaS

द्रष्टब्य :

१. प्रश्नहरु अंग्रेजी तथा नेपाली दूवै वा कूनै एक भाषामा मात्र पनि सोध्न सकिनेछ ।

२. प्रश्नहरु सैद्धान्तिक, व्यवहारिक र बिश्लेषणात्मक किसिमबाट सोधिनेछन् ।

३. परीक्षार्थीहरुले अंग्रेजी वा नेपाली मध्ये कूनै एक वा दूवै भाषामा उत्तर दिन सक्नेछन् ।

४. प्रश्नहरुसंग सम्वन्धित ऐन, नीति, नियम तथा प्रचलित नेपाल कानूनहरु (नेपाल दुरसञ्चार कम्पनी लिमिटडसंग सम्वन्धित समेत) मा परीक्षा मिति भन्दा तीन महिना अघिसम्ममा संशोधन भई कायम रहेका व्यवस्था लागु हूनेछ ।

५. यथासम्भव सबै शिर्षकहरुलाई समेट्ने गरी प्रश्नहरु सोधिनेछन् ।