

**नेपाल टेलिकम**  
(नेपाल दुरसंचार कम्पनी लिमिटेड)

प्राविधिक सेवा, टेलिकम ईन्जिनियरिङ्ग समूह, 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 -क (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.

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 विद्यमान 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 कारोबार सम्बन्धि ऐन, नियम तथा विनियम

- सार्वजनिक खरिद ऐन, २०६४ र सार्वजनिक खरिद नियमावली, २०६४
- भ्रष्टाचार 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
- आवश्यक 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.)

## महत्वपूर्ण जानकारीहरू

१. प्रश्नहरू अंग्रेजी तथा नेपाली दुवै वा कुनै एक भाषामा मात्र पनि सोध्न सकिनेछ ।
२. प्रश्नहरू सैद्धान्तिक, व्यावहारिक र विश्लेषणात्मक किसिमबाट सोधिनेछन् ।
३. परीक्षार्थीहरूले अंग्रेजी वा नेपाली मध्ये कुनै एक वा दुवै भाषामा उत्तर दिन सक्नेछन् ।
४. प्रश्नहरूसंग सम्बन्धित ऐन, नीति, नियम तथा प्रचलित नेपाल कानूनहरू (नेपाल दूरसञ्चार कम्पनी लिमिटेडसंग सम्बन्धित समेत) मा परीक्षा मिति भन्दा तीन महिना अघिसम्ममा संशोधन भई कायम रहेका व्यवस्था लागू हुनेछ ।

# Nepal Telecom

## Syllabus and Question pattern for Open Competition for lateral entry

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	Number of Questions to be solved	Weightage per question	Total Marks
1	Short Questions	15	12	5	60
2	Analytical and solution oriented	3	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.

- Problem identification
- Relate problem resolution with appropriate government & company rules and regulations
- Strategies & Suggestions for problem resolutions
- Methods for strategy implementation, monitoring and evaluation

# Nepal Telecom

Level: 8<sup>th</sup>                      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, lightning 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