**NEPAL TELECOMMUNICATIONS (NEPAL DURSANCHAR KAMPAINI LIMITEDE)**

प्राथमिक सेवा, टेलिकम इंजिनियरिङ्ग समूह, तह-० , वारिष्ठ इंजिनियर पदको खुल्ला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

**प्रथम पत्र :**

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

समूह -ख (Section B) - व्यवस्थापन र सामाजिक प्राथमिक ज्ञान (General Technical Knowledge) तथा समसामयिक विषयहरु (Contemporary Issues)

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

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

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Type of question</th>
<th>No. of Questions</th>
<th>Weightage/ question</th>
<th>Total Marks</th>
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<td>Long Answer questions</td>
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Total: 40

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

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

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<td>Long Answer questions</td>
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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.
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 (सामूह - ख) - व्यवस्थापन र सामान्य प्राविधिक ज्ञान (General Technical Knowledge) तथा समसायमयिक विषयहरू (Contemporary Issues)

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.)

**दस्तावेजः**

1. प्रथम प्रश्नम, अंग्रेजी तथा नेपाली दोबार वा कूवे एक भाषामा मात्र पनि सोभन सकिनेछौ।
2. प्रथम प्रश्नम, सैद्धांतिक, व्यवहारिक र विश्लेषणात्मक किसिममा दोभनेछौ।
3. परीक्षा प्रश्नम, अंग्रेजी तथा नेपाली मध्ये कूवे एक वा दूबे भाषामा उत्तर दिन सकिनेछौ।
4. प्रथम प्रश्नम, सम्बन्धित ऐस, नीति, नियम तथा प्रचलित नेपाल कानुनहरू (नेपाल दुर्घटना प्रभावित कम्पनी लिमिटेडलाई सम्बन्धित समेत) मा परीक्षा मिति भन्दा तीन महिना आघाममा सशोधन भएका व्यवस्था लागू हुनेछौ।
5. द्वितीय शास्त्र तथा शिष्यकहाउँलाई समेटने गरी प्रश्नम सेधिनेछौ।
Nepal Telecom
Syllabus and Question pattern for Open Competition

Level: 8  Post: Senior Engineer (Telecom)
Group: Technical  Subgroup: Engineering

Second Paper

Full Marks : 100  Pass Mark : 40

Time: 3 hours

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<td>Analytical and solution oriented</td>
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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
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. Spectrum 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
द्वारा : ।

1. प्रश्नहरू अंग्रेजी तथा नेपाली दूवै वा कूनै एक भाषामा मात्र पनि सोँै सकिनेछ ।

2. प्रश्नहरू सैद्धान्तिक, व्यक्तित्वक र विश्लेषणात्मक किसिमबाट साधिनेछन् ।

3. परीक्षा पूर्वमा अङ्ग्रेजी वा नेपाली मध्ये कूनै एक वा दूवै भाषामा उत्तर दिन सकिनेछन् ।

4. प्रश्नहरुसङ्ग सम्बन्धित ऐन, नीति, नियम तथा प्रचलित नेपाल कानुनहरू (नेपाल दरबार चार कम्पनी लिमिटेडसङ्ग सम्बन्धित समेत) मा परीक्षा मिति भन्दा लाई महिना अधिसम्मास र संशोधन भई कायम रहेका व्यवस्था लागू हुनेछ ।

5. यथासम्भव सँग शिक्षकहरुलाई समेटने गरी प्रश्नहरू साधिनेछन् ।