

Nepal Telecom

Nepal Doorsanchar Company Ltd.

Senior Engineer Level 8 Internal Competition Written Examination

(Telecom Group)

MARKS ALLOCATION CHART

Types of Question	Section A	Section B	No. of Question	Marks	Total Marks	Remarks
Objective Question	15	5	20	1	20	$\frac{1}{4}$ marks will be deducted for each incorrect answer
Short Question	5	5	10	5	50	
Long Question	2	1	3	10	30	
Total					100	

# Nepal Telecom

## Nepal Doorsanchar Company Ltd.

Telecom, Transmission, Switching, Outside Plant & Power संग सम्बन्धित सबै  
बिषयको लागि

Syllabus for Internal Competition Written Examination for Senior Engineer

Full Marks : 100

Pass Marks : 40

Time : 3 hours

(Common Subject for Telecom Group)

### **Section A : Technical**

Marks 60

#### **1. Basic Electrical and Electronics.** (Weightage 5% to 15%)

Circuit elements, series & parallel circuits, resistance, resistivity, Ohm's laws, Kirchoff's laws, Single phase & three phase circuit, star & delta connections, Measurement of current, voltage, power, energy, insulation, resistance, Primary & Secondary cells, Cells in series & parallel, Fundamentals of transformers, Generators and Induction motors, Electrical shock hazards, Earthing and shielding techniques for telecom equipments, lightning protections. Diode, Zener diode, LEDs, Transistors, Binary and Hexadecimal Number system combinational logics, K-Maps, Flip-flop, register, counter clock, shift registers, buses, power supplies & voltage regulators, power amplifiers, Oscillator circuits, Half wave rectifier full wave rectifier, Bridge rectifier, Logic gate: AND, OR, NOT, NAND, NOR.

#### **2. Telecommunications** (Weightage 15% to 25%)

Difference between analog and digital communications, Basic Communication Elements, Signal and noise in communication system, AM, DSB-SC, SSB-SC, PM, FM, Sampling theorem, PCM/ADPCM, Digital Modulation " ASK/PSK/FSK/QPSK/QAM, Phase locked loop.

Telecommunication network, Basic external plant, Components and structure of local telecommunication networks, Aerial and Underground Networks, Different types of Copper cables and Technical Parameters, Network Planning concept and NT standards, Copper Center. Types of faults in outside, Optical Fiber Access Network System, Optical transmitters and receivers, splices, connections & coupling, Fiber Optics Networks.

Transmission media, transformer and hybrid circuit, signal and noise measurements. echo & singing, space/time/frequency/wave length division multiplexing, PDH / SDH, DSL, line codes, packet, Message and circuit switching, Functions of switching, electronic switching, TS/ST/TST/STS switching No. 5 and No. 7 signaling, Erlang, Busy hour, ISDN, BISDN, ATM.

TCP/IP Protocol, OSI layers, computer networks, LAN, WAN, concept basics of C- programming.

Multiple Access Methods : FDMA, TDMA, CDMA, GSM (Global System for Mobile Communication), DECT (Digital European Cordless Telephony), MARTS (Multi Access Ratio Telephony System), VHF, UHF, Satellite Communications, Earth stations, V-SAT (Very Small Aperture Terminal), UMTS (Universal Mobile Telecommunications System), Next Generation Network, Voice Over IP, IP/PSTN platform, Intelligent Network.

### **3 Information and Communications Technology Basic.(Weightage 3% to 7%)**

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

#### **4. Power Supply System and Battery.** (Weightage 15% to 25%)

Different types of batteries used in Nepal Telecom. Charge/Discharge Characteristics, Method of Measuring Specific Gravity, Standard Cell Voltage of different types of Batteries. Difference between Solar Battery and Conventional Batteries, Deep Discharge, Battery Life. Over Charge Problem, Internal Resistance of Battery, Chemical Reaction of Batteries in Charge and Discharge condition, Maintenance process of Battery.

Three Phase Power Systems, Generating Plants, Distribution System, Stand by Diesel Generator, UPS, Renewable Energy – Solar, Solar Charge controllers, Voltage Regulator, Converter, Switching Mode Power Supply, Lightning Arrestor, Voltage regulators, Power supply, Series regulator, UPS, Inverter, Rectifier, AC and DC relays, MCB and MCCB, Block diagram of Power Supply System in Nepal Telecom.

Operational principles of internal combustion engine and its classification, difference between diesel and petrol engine, components of diesel engine, Coolant system requirements, Components of lubricating system. Oil filters, fuel-injection system, Governor, Fuel pump, Different types of diesel generators used in Nepal Telecom. Operation and Maintenance and control of diesel generators, Protection Provided for Mains Supply and Generator Supply, Normal and Interrupted Operational Sequences, Different types of Control Panel used in NT and their Various Components.

Refrigeration System (Carnot Cycles, Refrigerator & Heat Pump, Vapor compression Cycle etc.) Dalton's Law of partial pressures, relative humidity, humidity ratio and dew point temperature, refrigerants and their classification and properties, difference between Air Conditioning and Refrigeration System, Components of Air-condition system, Different types of Air Condition system used in Nepal Telecom.

#### **5 Maintenance and Safety Engineering.** (Weightage 3% to 7%)

Types of maintenance: Daily, Regular, Preventive, Corrective, Emergency; Major maintenance done in Power equipments used in Nepal Telecom. Electric shock hazards, Earthing and types of earthing, Shielding, techniques for electrical equipment, Electrical induction into communications lines, Surge protection, Industrial radiation hazards, Lightning protection and its necessity, Lightning arrestor.

## **Section B : Management Rules & Regulation.**

**Marks 40**

### **6. Project Management**

(Weightage 5% to 15%)

Project concept, objectives, project implementation schedule, project re-scheduling, project implementation alternative solutions, project leadership, preparation of cost estimate and budget, variation in project cost, opportunity cost concept, incremental cost and revenue analysis, cost benefit analysis, present value of project cost, General perception on internal rate of return, Net Present Value, Average Rate of Return, Return on Investment, working capital net worth, equity value, cost of capital .

### **7 Financial Management**

(Weightage 3% to 7%)

Generally accepted Accounting principles, stakeholders of account, profit & loss account. Income & expenditure accounts, balance sheet, operating and non operating cost, fixed cost, variable cost, flexible cost, intangible cost, hidden cost, capital expenditure. revenue expenditure, fixed assets, current assets, current liabilities, gross margin, net profit, retained earning, Time value of money.

### **8 Management Issues**

(Weightage 5% to 15%)

Management concept, Leadership, Problem solving and decision making staff motivation conflict management, Negotiation skills, MIS, Service delivery management participation management system, managerial hierarchies.

### **9 Marketing & Customer Care.**

(Weightage 3% to 7%)

Modern marketing concepts, strategic marketing planning, competitive marketing, importance of marketing wing within an organization customers satisfaction. Customer dealing, price decision, promotion decision, demand and supply forecasting Marketing management issue and challenges of NT.

## १० ऐन, विनियमावली, नीति नियम

(Weightage 5% to 15%)

- ❖ नेपाल दूरसंचार कम्पनी लिमिटेडको कर्मचारी विनियमावली २०६१ को परिच्छेद २ को विनियम २७, २८, २९ र ३० सम्बन्धी व्यवस्था र सो संग सम्बन्धीत अनुसूचीहरू परिच्छेद ६ बिदा, परिच्छेद ८ आचारण तथा अनुशासन, परिच्छेद १० सजाय र पुनरावेदन, परिच्छेद १२ विविध ।
- ❖ नेपाल दूरसंचार कम्पनी लिमिटेडको आर्थिक विनियमावली, २०७१ को भाग २ को खरिद सम्बन्धि कार्यविधि, भाग ३ को परिच्छेद १, योजना तर्जुमा, वार्षिक कार्यक्रम र बजेट, परिच्छेद ३ कम्पनीको सम्पत्तिको जिम्मा, त्यसको लगत, संरक्षण र बरबुभारथ, ।
- ❖ कम्पनी ऐन, २०५३ को परिच्छेद २ कम्पनीको स्थापना, परिच्छेद ४ शेयर र डिवेन्चर, परिच्छेद ६ संचालक समिति, परिच्छेद ७ कम्पनीको हिसाव र लेखा, परिच्छेद ८ लेखा परिक्षण ।
- ❖ दूरसंचार ऐन, २०५३ को परिच्छेद ७ दूरसंचार लाईनको जडान र रेखदेख, परिच्छेद ८ सेवा शुल्क निर्धारण तथा असूली, परिच्छेद ११ विविधको दफा ४९, रेडियो फ्रिक्वेन्सी नीति निर्धारण सम्बन्धी व्यवस्था ।
- ❖ आयकर ऐन, २०५८ तथा आयकर नियमावली २०५९ अन्तर्गत अग्रिम आयकर कट्टी गर्ने सम्बन्धी व्यवस्थाहरू ।
- ❖ नेपाल दूरसंचार कम्पनी लिमिटेडको प्रवन्धपत्र तथा नियमावली
- ❖ दूरसंचार नीति २०६०
- ❖ सूचना प्रविधि नीति ।

### द्रष्टव्य :

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