

Nepal Telecom

Syllabus for Internal Competition Written Examination for Senior Engineer (Telecom Level 7 To Level 8 Tech)

Full Marks: 100

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 systems, 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 gates: AND, OR, NOT, NAND, NOR.

2 Telecommunications *(Weightage 15 to 25%)*

Difference between analog and digital communications, Basic communications 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 telecommunications 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 plant, Optical Fiber Access Network System, Optical transmitters and receivers, splices, connectors & 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 Communications), DECT (Digital European Cordless Telephony), MARTS (Multi Access Radio Telephony System), VHF, UHF, Satellite communications, Earth stations, VSAT (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 Basics *(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 Systems, 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 Systems (Carnot Cycles, Refrigerator & Heat Pump, Vapour 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 systems, Different types of Air condition systems 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, Lightening protection and its necessity, Lightening arrestor.

(Telecom Level 7 To Level 8 Tech)

Section B Management , Rules & Regulations

Marks 40

6. Project Management and Project evaluation
(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, participatory 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, Pricing Decision, Promotion decision , Demand and supply forecasting, Marketing management issues and challenges of NT.

10. 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 आचरण तथा अनुशासन, परिच्छेद १० सजाय र पुनरावेदन, परिच्छेद १२ विविध ।

नेपाल दूरसंचार कम्पनी लिमिटेडको आर्थिक विनियमावली २०६१ को परिच्छेद २ वार्षिक कार्यक्रम र बजेट, परिच्छेद ३ कम्पनीको सम्पत्तीको जिम्मा, त्यसको लगत, संरक्षण र वरबुझारथ, परिच्छेद ५ खरीद र प्राप्ती, परिच्छेद ६ बोलपत्र सम्बन्धी कार्यविधि ।

कम्पनी ऐन २०५३ को परिच्छेद २ कम्पनीको स्थापना, परिच्छेद ४ शेयर र डिबेन्चर, परिच्छेद ६ संचालक समिति, परिच्छेद ७ कम्पनीको हिसाब र लेखा, परिच्छेद ८ लेखा परीक्षण ।

दूरसंचार ऐन २०५३ को परिच्छेद ७ दूरसंचार लाईनको जडान र रेखदेख, परिच्छेद ८ सेवा शुल्क निर्धारण तथा अशुली, परिच्छेद ११ विविधको दफा ४९ रेडियो फ्रिक्वेन्सी नीति निर्धारण सम्बन्धी व्यवस्था ।

आयकर ऐन २०५८ तथा आयकर नियमावली २०५९ अन्तर्गत अग्रिम आयकर कट्टी गर्ने सम्बन्धी व्यवस्थाहरु ।

नेपाल दूरसंचार कम्पनी लिमिटेडको प्रवन्धपत्र तथा नियमावली

दूरसंचार नीति २०६० ।

सूचना प्रविधी नीति ।

द्रष्टव्य : प्रश्नपत्रहरसंग सम्बन्धीत नीति, ऐन, नियम, विनियमावलीहरु
परीक्षा मिति भन्दा ३ महिना अघिसम्म संशोधन भई कायम रहेको
व्यवस्था लागु हुनेछ ।