

नेपाल दूरसञ्चार प्राधिकरण
प्राविधिक सेवा: इञ्जिनियरिङ्ग समूह, सहायक निर्देशक
(अधिकृत स्तर तृतीय श्रेणी) को लिखित परिक्षाको
पाठ्यक्रम, २०६५ ।

लिखित परीक्षा

परीक्षा योजना (Examination Scheme)

पत्र	विषय	अंक भार	परीक्षा प्रणाली	समय	पूर्णाङ्क
प्रथम पत्र	सामान्य ज्ञान र दूरसञ्चार सम्बन्धी (सबै सेवाको लागि)	१००	वस्तुगत बहुउत्तर छोटो उत्तर लामो उत्तर	१ X ३० = ३० ४ X १० = ४० १० X ३ = ३०	३ घण्टा
द्वितीय	सेवा सम्बन्धी, अर्थशास्त्र र व्यवस्थापन	१००	छोटो छोटो उत्तर विश्लेषणात्मक र समाधानमूलक उत्तर	८ X १० = ८० १ X २० = २०	३ घण्टा
तृतीय	इलेक्ट्रोनिक्स एण्ड टेलिकम्युनिकेशन इञ्जिनियरिङ्ग	१००	छोटो छोटो उत्तर लामो उत्तर	१६ X ५ = ८० २ X १० = २०	३ घण्टा

१. लिखित परीक्षाको माध्यम भाषा अंग्रेजी वा नेपाली अथवा अंग्रेजी र नेपाली दुवै हुन सक्नेछ ।
२. यथासम्भव प्रश्नहरु नेपालको सन्दर्भमा सोधिने छन् ।
३. द्वितीय पत्रको समाधानमूलक प्रश्नको उत्तर आवश्यकता अनुसार निम्नानुसार चार भागमा विभाजन गरी प्रस्तुत गर्नु पर्नेछ:
 - (क) पहिलो भागमा समस्याको पहिचान
 - (ख) दोश्रो भागमा समस्या समाधानको लागि मौजुदा सरकारी नीति र कार्यक्रम
 - (ग) तेश्रो भागमा समस्या समाधानको लागि सुझाव
 - (घ) चौथो भागमा सुझाव कार्यान्वयन, अनुगमन र मूल्यांकन गर्ने ठोस तरिका
४. द्वितीय र तृतीय पत्रको खण्ड -ख) को विषयगत प्रश्नहरुको स्वरुप निम्नानुसार हुन सक्नेछ :
 - ४.१ लामो उत्तर दिने पूरा प्रश्नहरु सोध्न सकिनेछ ।
 - ४.२ २० अङ्कको एउटै प्रश्नलाई दूई वा दूई भन्दा बढी भागमा (Two or more parts of a single question) विभाजन गरी सोध्न सकिनेछ ।
 - ४.३ एउटा प्रश्न अन्तर्गत दूई वा बढी टिप्पणीहरु (Short notes) सोध्न सकिने छ ।
५. यस पाठ्यक्रममा जेसुकै लेखिएको भएता पनि पाठ्यक्रममा परेका ऐन, नियमहरु परीक्षाको मिति भन्दा ३ (तीन) महिना अगाडि (संशोधन भएका वा संशोधन भई हटाइएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा रहेको सम्झनु पर्दछ ।
६. यस भन्दा अगाडि लागू भएका माथि उल्लिखित सेवा, समूह, उपसमूहहरुका पाठ्यक्रमहरु खारेज गरिएका छन् ।
७. पाठ्यक्रम लागू मिति: २०६५।३।.... देखि लागू हुनेछ ।

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प्राविधिक सेवा, इञ्जिनियरिङ्ग समूह, सहायक निर्देशक (अधिकृत स्तर तृतीय श्रेणी) को
खुला प्रतियोगिता र आन्तरिक प्रतियोगिताको लिखित परिक्षाको
पाठ्यक्रम, २०६५

द्वितीय पत्र : सेवा सम्बन्धी, अर्थशास्त्र र व्यवस्थापन

Full Marks: 100

Time: 3 hours

1. Telecommunications

40

Principles of telecommunications, role of telecommunications in national development, global information network, information superhighway, convergence of networks, satellite system, microwave system, radio system, GSM, CDMA, DAMPS, PCS, GMPCS, WCDMA, DECT, PSTN, Optical fiber, LAN, WAN, MAN, broadband cable, frame relay, MPLS, NGN, IMS, Multiplexing, signaling, alerting & supervision, traffic engineering, network optimization, ADSL, ATM, SONET, ISDN, BISDN, VOIP, Internet, Protocols used in network and application, Privacy and security, search engine, Digital voice and video, Encryption and security issues in data communications, OSI model, R2/SS7, spectrum management principle, fundamental of e-commerce, internet and networking economics, tariff of data transfer, cyber laws in e-commerce and e-governance, Present status of telecommunications services in Nepal.

2. Engineering Economics

20

Demand and Supply, Laws of return, form of business organization, Taxation, Industrial laws, cost accounting, Depreciation, Wages and Incentives, Capital budgeting, Capital structure, Financial analysis, Risk analysis, Interest & time value of money, Basic methodology of engineering economic studies Basic knowledge of trial balance & Balance sheet, income statements, revenue and capital expenditure, budgeting and capitalization, depreciation and subsidy, Procurement procedures (FOB, CIF, LQD, LC, Insurance, Invoice, Bid security, performance bond), Competitive bidding

3. Telecom Regulation

20

Regulation of Telecommunications and Broadcasting, Regulation of Information and Communications Technologies, Cyber laws, Interconnection issues, ITU's recommendations for numbering system for telephone and voice, national

numbering system, International numbering system, ITU, INTELSAT, APT, INMARSAT, role of regulator in a competitive market.

4. Managements

10

Definitions, the project life cycle, Setting project objectives & goals, Network model: CPM & PERT, Gant chart, Project scheduling, Resource leveling, Systems of Project control, Cost control, Preparation of operational budget, Introduction to budgetary control, Planning the quality, time & cost dimensions, Negotiating for Materials, Supplies & Services, Bringing the project to a Successful conclusion.

Vision, Mission, Goal, Objectives, Targets, Strategies, Organization structure, Authority and Power delegation, Leadership, Motivation, Group dynamics, Time management, Conflict Management, MIS, Out sourcing, Inventory control, Job description.

5. Regulatory Acts

10

ITU Radio Regulations, Radio Act 2014, National Broadcasting Act 2047, Telecommunications Act 2053, Telecommunications Regulations 2054, Company Act 2053, Privatization Act 2050, Consumer Protection Act 2054, Competition Promotion and Market Protection Act 2063, Telecommunication Policy 2060, IT (Information Technology) Policy 2057.

माथिको खण्डहरुवाट विषयगत प्रश्नहरु १० वटा सोधिनेछ जसवाट ८ वटा प्रश्नको उत्तर दिनु पर्नेछ र समस्या समाधान गर्ने २० अंकका प्रश्न २ वटा सोधिने छ र एउटाको उत्तर दिनु पर्नेछ ।

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प्राविधिक सेवा: इञ्जिनियरिङ्ग समूह, सहायक निर्देशक (अधिकृत स्तर तृतीय श्रेणी) को
खुला प्रतियोगिता र आन्तरिक प्रतियोगिताको लिखित परिक्षाको
पाठ्यक्रम, २०६५

तृतीय पत्र : इलेक्ट्रोनिक्स एण्ड टेलिकम्युनिकेशन इञ्जिनियरिङ्ग

Full Marks: 100

Time: 3 hours

1. **Digital Electronics** 10
Bipolar transistors switching characteristics, MOS transistor switching characteristics, TTL logic circuits, NMOS/CMOS logic circuits, Memory: RAM, DRAM, PROM, EPROM, Operational amplifiers, S&H circuits, Adders, Arithmetic operations, Digital comparators, Multiplexer & Demultiplexers, Flip-flops, Shift register, Counters, Sequence generators, Power electronics: Thyristor, Controlled rectifier circuits, 7 segment display, Untuned amplifier, Push-pull amplifier, tuned power amplifiers, Feed back amplifiers, bode plot analysis, Wien bridge oscillators, tuned LC oscillators, crystal oscillator.
2. **Electromagnetic field and waves** 5
Coulomb's law and Electric field intensity, Electric Flux Density and Gauss' law, Maxwell's first equation and application, divergence theorem, energy & potential, Laplace equation and Poisson equation, Biot-Svart's law, Ampere's circuital law, Curl, Wave motion in free space, Perfect dielectric and losses, Wave medium, Skin effect, Impedance matching, Antenna fundamental, Polarizations, Radiation from dipole antenna, wave guides and mixtures.
3. **Signals and Systems and Processing** 10
Information theory, Shannon-Hartley law, Transmission of signals, Impulse response and convolution, Fourier series, Fourier Transform, Unit step, Delta, Sinc & Signum function, Helbert transform, LTI system, System described by Differential & Difference equations, FIR & IIR Filters, Discrete Fourier Transforms, IDFT, FFT, Circular convolutions, Parseval's theorem, Energy & power and auto correlation, Z transform.
4. **Communications Engineering** 10
Difference between analog and digital communications, Basic communications elements, Signal and noise in communication system, AM, DSC-SC, SSB-SC, PM, FM, Super heterodyne AM and FM receiver, Digital to analog and analog to digital conversion, Sampling theorem, Sample & hold Circuit, A law, μ -law, quantizer, Coding: NRZ/HDB3/AMI, Error detection and correction, PCM/ADPCM, Digital Modulation: ASK/PSK/FSK /QPSK /MSK / QAM, Modulation and demodulation circuits, Frequency converter and Mixers, Phase locked loop

10. Data Communications

10

Introduction, OSI Model, Data transmission, Data encoding by Line coding, Asynchronous and Synchronous Transmission, Error detection, Interfacing, Data link layer, Routing in Packet switched Networks, Flow and Congestion control, LAN and MAN, Computer communications architecture.

11. Teletraffic Engineering

5

Traffic units and parameters, Holding time and call intensity, Offered traffic and carried traffic, congestion and delay, traffic variation, subscriber behavior, distribution of traffic, Full and restricted availability, Full availability loss system (Erlang and Engset), Lost call theory for restricted availability, Full availability delay system, Grade of service, Traffic measurements, ISDN traffic considerations.

माथिको खण्डहरुवाट विषयगत प्रश्नहरु १८ वटा सोधिनेछ जसवाट १६ वटा प्रश्नको उत्तर दिनु पर्नेछ र लामो उत्तर दिने १० अंकका प्रश्न ३ वटा सोधिने छ र दुईवटाको उत्तर दिनु पर्नेछ ।