

लोक सेवा आयोग
नेपाल इञ्जिनियरिङ्ग सेवा, इलेक्ट्रोनिक्स एण्ड टेलिकम्युनिकेशन इञ्जिनियरिङ्ग समूह, राजपत्राङ्कित
तृतीय श्रेणीको खुला र आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

द्वितीय पत्र :- इलेक्ट्रोनिक्स एण्ड टेलिकम्युनिकेशन इञ्जिनियरिङ्ग

- 1. Electronics Device, Circuit and Techniques** **20%**
Use, operation and characteristics of Diode, triode, pentode, Transistors, thyristor; measurement of resistance, capacitance, inductance, current, voltage in different R-C-L circuit, different types of amplifiers and rectifiers' usage and characteristics, Strain gauge and application, SCR (simple, phase control, temperature control, light control), close/open loop control and choppers, Boolean algebra, Logical gates and switching algebra, Memory (statics, volatile), A/D & D/A converter circuits, Sampling theory
- 2. Information Technology** **10%**
Computer, Microprocessor, Signal processing, Database Management, Computer Architects and computer Graphics, Internet, email and Web-pages, e-strategies (e-government, e-business, e-learning, e-health, e-employment, e-environment, e-agriculture, e-science), Tele-culture (Tele-education, Tele-medicine, tele-centre, Tele-phony, and etc.)
- 3. Communication** **20%**
Radio propagation in different waves (long wave to SHF), propagation characteristics, frequency availability, limitation element at VHF, UHF, discrete and continuous spectrums, stray capacitance, internal load inductance, dummy load, Traveling and standing waves, match and mismatch lines, distribution component of line, Variable impedance along a mismatched line, Tune circuit and filters, Phase velocity, phase shift, group velocity, wave guides, antenna fundamentals (types, characteristics, pattern, matching), Modulation & demodulation types and techniques for analogue and digital system, different types of Noise and calculation, frequency generation, counters. Random signal theory (Ergodic processes, correction function, white noise)
- 4. Navigation, surveillance, Avionics** **10%**
Radar range equation, Radar direction indication, Radar Display, different between PAR, SSR, Doppler effect, MTI Radar, HF-SSB communication, General concept of Navigation system (MLS, ILS, Radio Beacons and determinations, VOR, DME, GPS) and Airborne equipment (FIS, altimeter,), ICAO Annex 11
- 5. Frequency Management & Monitoring** **10%**
Radio Frequency band and allocation, Frequency Channel plan (as per separation and system), spurious emissions, system (Simplex, duplex, dual) Type of radio services, Terrestrial line-of-sight communication links (propagation, effects of atmosphere, interference, fading) Broadcasting band, Frequency monitoring systems (techniques and procedures, scanning, location & direction finding), Satellite communication (orbital locations, choice of frequency, modulation techniques) and earth station (antenna, terminal equipment, ground networking, earthling) National Frequency Allocation Plan
- 6. Power supplies** **10%**
Single phase and Polyphase AC power supply systems, Electrical motors, AC/DC generators, Rectifiers and filters, Regulator power supply system, Uninterruptible Power Supply Systems.
- 7. Management Concepts** **10%**
Role of Science and technology in development, Parameters of development, Measurement of Development, Targeting Vision, mission, goal and objectives; strategies and work description of organization and its' structures, authority and power delegation, leadership, motivation, group's dynamics, time management, conflict management, use of MIS, decision support system, customer care, out sourcing, use of inventory and training, service port folio
- 8. Rules, Regulations & Policy** **10%**
ITU overview, ICAO Overview, ICT policy, Telecommunication Policy, Telecommunication Act & Regulations, Radio Act & Regulations, National Broadcasting Act & Regulation, Cyber-law, National Frequency Allocation Plan

विषयगत नमूना प्रश्नहरू (Sample Questions)

1. Why do we need frequency planning and allocation? Which organization provides guidelines on frequency management? [10]
2. In which type of modulation, signal to noise ratio is the best? Explain with necessary justifications. [10]
3. How can you use ICT for realizing the concept of telemedicine? Explain with necessary block diagram. [10]
4. What do you mean by RADAR? Where is it used? How does it work? [10]
5. Explain what are the parameters of fifth generation computers. Show how can you use computer for controlling the quality of industrial product. [10]