

नेपाल नागरिक उड्डयन प्राधिकरण  
प्राविधिक सेवा, ईलेक्ट्रोनिक एण्ड टेलिकम्युनिकेशन इंजिनियरिङ्ग समूह, नवौं तह, प्रबन्धक पदको खुला/आन्तरिक  
प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

द्वितीय पत्र : सेवा सम्बन्धी

खण्ड (क) - ५० अङ्क

**1. Telecommunication Systems**

- 1.1. Wireless systems: Satellite, Microwave/Ultra High frequency (UHF), Wireless Local loop (WLL), Cellular
- 1.2. Wireline systems: PSTN, Optic fiber, LAN, WAN/MAN, Broadband cable

**2. Data systems**

- 2.1. Transmission and digital multiplexing systems- E1, T1, SDH, PDH, SONET
- 2.2. Broadband techniques-DSL, ATM
- 2.3. ISDN and VoIP

**3. Digital Networks**

- 3.1. Architecture
- 3.2. Network components
- 3.3. Framing
- 3.4. Channelization and signaling
- 3.5. Packet and Switched services-ATM, xDSL, Frame Relay, X-25. MPLS, WIFI
- 3.6. Protocols: the ISO/OSI reference model, X.25, TCP/IP, X.400
- 3.7. Internetworking and router-based networks: the TCP/IP suite of protocols, routing and flow control, Internet addressing and domain names.
- 3.8. Encryption and security issues

**4. Voice systems**

- 4.1. Transmission and Switching systems
- 4.2. Modulation techniques
- 4.3. Multiplexing and signaling
- 4.4. Alerting and supervision

**5. Power supply and lightning protection systems**

- 5.1. Power supply reliability and availability requirements for aviation ground systems
- 5.2. Isolation and surge protection systems
- 5.3. lightning protection systems
- 5.4. UPS, backup generators, power supply switch-over times for aviation ground systems

खण्ड (ख) - ५० अङ्क

**6. Communication Navigation and Surveillance (CNS) Systems**

- 6.1. Communication systems
  - 6.1.1. Voice- AM, SSB, SATCOM, ATIS, Designated operational coverage, Air-Ground, Ground-Ground Communication, Voice Communication Switching System (VCCS)
  - 6.1.2. Data -AFTN, ATN, ATS Message Handling systems, ATS Interfacility Data Communications, Data links (VHF, HF, Mode-S)
- 6.2. Navigation systems
  - 6.2.1. Terrestrial radio navigation systems
  - 6.2.2. Satellite radio navigation systems (GNSS)

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- 6.2.3. Introduction to inertial and multisensor navigation systems
- 6.2.4. Landing systems (ILS, MLS, GLS)
- 6.3. Surveillance systems
  - 6.3.1. Cooperative/non-cooperative and dependent /independent surveillance (PSR, SSR, MSSR, ADS-B, ADS-C, MLAT etc)
  - 6.3.2. Precision approach and surface movement RADARs
  - 6.3.3. Multi-Sensor Data Processing System
- 6.4. Aviation Security
  - 6.4.1. Fundamentals of electronic security systems (X-ray baggage inspection systems, CCTV, Metal detectors), Flight Information Display System
- 6.5. Air traffic management
  - 6.5.1. Fundamentals of air traffic services and management
  - 6.5.2. Fundamentals of Performance Based Navigation (PBN) and National PBN Plan
- 7. ICAO and Standardization**
  - 7.1. ICAO global, regional and nation air navigation plans and planning process
  - 7.2. Global Air Navigation Plan-Performance improvement areas
  - 7.3. Global Air Traffic Management Operational Concept, BBB framework, ASBU framework; Aviation System Block Upgrades-blocks and modules
  - 7.4. APAC Seamless ATM/ANS Plan
  - 7.5. Competency based training and assessment for ATSEP –phases, concept and design
  - 7.6. Standards and applicability in the installation and maintenance of CNS/ATM systems
  - 7.7. ICAO Annexes 10 Volumes 1-6, Annex 11, 15 and related Documents
  - 7.8. Ground and flight checks of airways facilities and facility status determination
- 8. Radio spectrum management**
  - 8.1. Role of ITU and Spectrum management principles
  - 8.2. National spectrum management policies
  - 8.3. Equipment Authorization/approval and monitoring
  - 8.4. Spectrum measurements, monitoring, and interference resolving
  - 8.5. Aviation radio spectrum management and roles of ICAO, ITU and WRC
- 9. Human Factors issues in CNS/ATM systems**
  - 9.1. Automation in advanced aviation systems
  - 9.2. Human-centered technology
  - 9.3. Principles of human-centered automation
  - 9.4. Qualities of human-centered automation
- 10. Safety oversight of Air Navigation Services**
  - 10.1. Organizational structure for safety oversight of ANS
  - 10.2. Distinction between the regulator and service providers
  - 10.3. Oversight surveillance programme
  - 10.4. SMS legislation and regulations for ANS providers and implementation
- 11. Project Management and Procurement**
  - 11.1. Project management and Project Cycle
  - 11.2. National Standard Bidding Document and International Standard Bidding Document, PPMO guidelines
  - 11.3. Procurement of Goods/Services/Consulting Services
  - 11.4. Terms of Reference (ToR), EOI, RFP

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11.5. Contract Documents

11.6. Monitoring and evaluation (problem reporting and change requests) and progress reporting

11.7. Evaluation and testing for acceptance

11.8. Quality control and assurance

11.9. Contract management and dispute resolution

द्वितीय पत्रबाट निम्नानुसार प्रश्न सोधिनेछ :

द्वितीय पत्र (विषयगत)				
विषय	खण्ड	अङ्कभार	तर्कयुक्त विश्लेषणात्मक प्रश्न	समस्या समाधानमूलक प्रश्न
सेवा सम्बन्धी	(क)	५०	३ प्रश्न X १० अङ्क = ३०	१ प्रश्न X २० अङ्क = २०
	(ख)	५०	३ प्रश्न X १० अङ्क = ३०	१ प्रश्न X २० अङ्क = २०
जम्मा		१००	६ प्रश्न X १० अङ्क = ६०	२ प्रश्न X २० अङ्क = ४०