

नेपाल नागरिक उड्डयन प्राधिकरण
प्राविधिक सेवा, सिभिल ईन्जिनियरिङ्ग समूह, नवौं तह, प्रबन्धक पदको खुला/आन्तरिक प्रतियोगितात्मक लिखित
परीक्षाको पाठ्यक्रम
द्वितीय पत्र : सेवा सम्बन्धी
खण्ड (क) - ५० अङ्क

- 1 **Civil Aviation: History and Developments**
 - 1.1 History of Civil Aviation and role of International Civil Aviation Organization ICAO
 - 1.2 Role of Ministry of Culture, Tourism and Civil Aviation
 - 1.3 Functions and responsibilities of Civil Aviation Authority of Nepal
 - 1.4 Economic, political, and social roles of airports
 - 1.5 Impact of Liberal Aviation policy in Nepal
 - 1.6 Public Private Partnership (PPP) for the development and operation of Airports

- 2 **Airport Master Planning and Design**
 - 2.1 **Elements of Airport Master Planning**
 - 2.1.1 Information required for planning consideration
 - 2.1.2 Air Space planning
 - 2.1.3 Preliminary feasibility of physical requirements
 - 2.1.4 Aircraft characteristic related to airport design
 - 2.1.5 Wind rose diagram
 - 2.1.6 Airport site evaluation and selection
 - 2.1.7 Operational considerations for airport site selection
 - 2.1.8 Components of the airport system for an airport
 - 2.1.9 Airport system plan, airport master plan and airport project plan
 - 2.1.10 Socio-economic and financial feasibility
 - 2.1.11 Airport land-use planning, environmental impact assessment
 - 2.2 **Traffic forecasting for planning purpose: (Passenger, Aircraft, Cargo, Mail)**
 - 2.2.1 Accuracy and limitations
 - 2.2.2 Principle and methods of air traffic demand forecasting
 - 2.2.3 Factors affecting air traffic growth
 - 2.2.4 Forecasting requirements and applications
 - 2.3 **Airport layout**
 - 2.3.1 Runway orientation and runway configurations
 - 2.3.2 Taxiways system, apron & holding bays
 - 2.3.3 Terminal area, Cargo Terminal/Complex, Hangar
 - 2.3.4 Obstacle limitation surfaces

- 3 **Airport Design**
 - 3.1 Geometric Design of the Aerodrome
 - 3.1.1 Runway: Physical characteristics, runway length and factors affecting runway length requirement
 - 3.1.2 Taxiway and taxi-lanes: Function of taxiways, types of taxiways, physical characteristics of taxiways
 - 3.1.3 Aprons and holding bays: Functional requirements, types and size of apron, configuration of apron, holding bays and bypasses, isolated aircraft parking Position and its significance
 - 3.1.4 Apron utility requirement
 - 3.1.5 Junctions and intersections

- 4 **Airport Airside Capacity and Delay**
 - 4.1 Capacity and delay
 - 4.2 Estimating capacity and delay

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- 4.3 Runway capacity, taxiway capacity, apron gate capacity
- 4.4 Practical and ultimate capacity, maximum throughput rate
- 4.5 Factors affecting capacity and delay
- 4.6 Approaches to reducing delay

5 Airport Terminal and Ground Access

5.1 Passenger Terminal System

- 5.1.1 Concept development
- 5.1.2 Access Interface
- 5.1.3 Processing
- 5.1.4 Flight Interface

5.2 Design Considerations

- 5.2.1 Overall space/area requirement
- 5.2.2 Distribution concept
- 5.2.3 Apron-Gate system
- 5.2.4 Aircraft parking layout
- 5.2.5 Baggage handling system and claim facilities
- 5.2.6 Passenger amenities
- 5.2.7 Airport ground access system
- 5.2.8 Internal airport roadway circulation
- 5.2.9 Passenger building curb
- 5.2.10 Land side vehicle parking

6 Airport Pavement Design

6.1 Structural Design of Airport Pavement

- 6.1.1 Design considerations for structural design of pavements: traffic and loading, aircraft characteristics, Construction materials, environmental considerations
- 6.1.2 CBR method of design for flexible airport pavements
- 6.1.3 Design of rigid pavements
- 6.1.4 Pavements design using elastic layer theory
- 6.1.5 FAA method of design for flexible and rigid airport pavement
- 6.1.6 Use of FAA pavement design software (FAARFIELD software) for airport pavements design
- 6.1.7 Pavement design for light aircraft

6.2 Design of Overlay Pavements

- 6.2.1 Flexible pavement overlays on flexible pavements
- 6.2.2 Flexible pavement overlays on rigid pavements
- 6.2.3 Rigid pavement overlays on flexible pavements
- 6.2.4 Rigid pavement overlay on rigid pavements

7 Airport Drainage

- 7.1 Basic concept of airport drainage, catchment area, surface runoff, layout of surface drainage, subsurface drainage
- 7.2 Intensity-duration pattern for the design storm
- 7.3 Amount of runoff using FAA guidelines
- 7.4 Amount of runoff using Corps of Engineers guidelines

8 Pavement Evaluation & Management Systems

- 8.1 Aircraft Classification numbers (ACN) and Pavement Classification numbers (PCN) as per ICAO

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- 8.2 Pavement condition survey and rating procedure
- 8.3 Pavement surface friction and tests
- 8.4 Pavement evaluation and methods of conducting the test to verify the structural strength of the pavement
- 8.5 Airport pavement preservations

9 Innovative Technologies in Airport Pavement Construction

- 9.1 Super-pave for airport pavement
- 9.2 Warm mix asphalt for airports
- 9.3 Fuel resistant asphalt mixes

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10 Visual Aids for Navigation

- 10.1 Markings
- 10.2 Signs
- 10.3 Lights in general
- 10.4 Markers
- 10.5 Surface movement guidance and control system
- 10.6 Frangibility requirements

11 STOLport and Heliports

- 11.1 STOLport: Characteristics of STOLport and its importance in Nepal
- 11.2 Helipad: Characteristics of helipad and its importance in Nepal
- 11.3 Heliports: Characteristics of helicopters for heliport design, factors affecting the site selection of heliport

12 Environmental Impacts of Airports and Aviation Activities

- 12.1 Aircraft noise in the vicinity of airports
- 12.2 Water, Air and soil pollution in the vicinity of airport
- 12.3 Initial environmental examination (IEE)
- 12.4 Environmental impact assessment (EIA)
 - 12.4.1 Environmental management plan during construction and operation phases of airport
 - 12.4.2 Global environmental issues arising from aviation activities

13 Aerodrome Construction Project Management

- 13.1 Construction management
- 13.2 Tender and contract documents, PPMO Guidelines and FIDIC contracts
- 13.3 Resource mobilization in construction of airport infrastructures
- 13.4 Construction materials
- 13.5 Construction equipment management and mobilization for works
- 13.6 Occupational health & safety and Aerodrome work safety in operational airport during construction
- 13.7 Quality assurance plan, quality control, cost control & time control
- 13.8 Work program/schedule, CPM, PERT method of scheduling the construction activities, Preparation of progress reports, Earned Value Analysis (S-curve), use of scheduling software and schedule control
- 13.9 Variation, alteration and omissions
- 13.10 Dispute, claim, adjudication & arbitration

14 Aerodrome Safety

- 14.1 ICAO Universal Safety Oversight Audit Program (USOAP)
- 14.2 Regulatory functions and requirements under Civil Aviation Authority of Nepal
- 14.3 ICAO and National requirements on certification of aerodrome

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- 14.4 Aerodrome Certification procedure in Nepal
 - 14.5 Surveillance, audit and inspection of aerodromes for the certification
 - 14.6 Safety Management
 - 14.7 Concept of State Safety Program (SSP)
 - 14.8 Safety Management System (SMS)
 - 14.9 Safety policy, Safety risk management, Safety assurance & Safety promotion
 - 14.10 Hazard identification, Safety Risk Assessment, Risk mitigation, gap-analysis, Acceptable Level of Safety, SMS implementation, Runway Safety Program, Runway Safety Team, Safety Action Group, Safety Review Board
 - 14.11 Wildlife Hazard Management (WHM)
- 15 Aviation Security**
- 15.1 Basic concept
 - 15.2 National Civil Aviation Security Programs
 - 15.3 Restricted areas and access control
 - 15.4 Airside vehicle control
 - 15.5 Perimeter control for the operational areas
 - 15.6 Isolated Aircraft parking position
- 16 Facilitation in Airport Operation**
- 16.1 National Airport Facilitation Program
 - 16.2 Facility Required for public health emergency and medical relief
 - 16.3 Transfer and Transit facilities
 - 16.4 Baggage handling facilities
 - 16.5 Cargo handling and Clearing facilities
 - 16.6 Search and rescue facilities
 - 16.7 Facilities required to Respond natural and manmade disaster
 - 16.8 Facilities for the transport of person with disabilities
- 17 Airport Economics and Management**
- 17.1 National economy and airport sector development strategy
 - 17.2 Airport financing and investment modalities
 - 17.3 Concept of infrastructure development and operation through Public Private Partnership (PPP), Build, Operate & Transfer (BOT), Build, Own, Operate & Transfer (BOOT), Engineering Procurement Construction/Financing (EPC/EPCF)
 - 17.4 Concept of project financial analysis Such as ROI (Return on Investment), IRR (Internal Rate of Return), NPV (Net Present Value) and others
 - 17.5 Concept of Airport Management Information System

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