नेपाल नागरिक उड्डयन प्राधिकरण

प्राविधिक सेवा, सिभिल ईन्जिनियरिङ्ग समूह, पाँचौं तह, वरिष्ठ सहायक पदको खुला/आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

द्वितीय पत्र – सेवा सम्वन्धी

खण्ड (क) – ५० अङ्क

1. History of Civil Aviation

1.1. History of Civil Aviation in general and Nepal in particular

1.2. International and Domestic Airports in Nepal

2. Airport Engineering

2.1. **Definition :** Aerodrome, Aerodrome Elevation, Aerodrome Reference Point, Aeroplane Reference Field Length, Aerodrome Reference Temperature, Runway, Runway Strip, Threshold, Runway Turn Pad, Shoulder, Touch Down Zone, Taxiway, Taxiway Strip, Apron, Maneuvering Area, Movement Area, Obstacle Limitation Surface, Heliport, Passenger Terminal Building, Air Traffic Control Tower, Operation Building, Hangar

2.2. **Design**

2.2.1. General items contained in ANNEX 14, Volume -I, Aerodrome Design & Operations, Volume- II, Heliport (ICAO Publication)

2.2.2. Runway length calculation and correction

2.2.3. Basic knowledge of STOLport & Heliport

2.2.4. Water supply, sanitation and Solid waste management system in airports

2.3. **Airport Pavement Types, its Structural Components and Construction Technology**

2.3.1. Flexible and Rigid Pavements, Subgrade Preparation, Sub-base and Base Course, Asphalt Concrete Pavement, Plain Cement Concrete Pavement, Plants and Equipment for Airport Construction

2.3.2. Basic design concept for Flexible and Rigid airport pavement

2.4. **Airport Maintenance**

2.4.1. Maintenance of Runway, Taxiway and Apron, Maintenance of Airport Drainage, Maintenance of Side Stripe, Maintenance of Airport Buildings

3. Surveying

3.1. **General**

3.1.1. Classifications, Principle of Surveying, Selection of Suitable method, - Scales, Plans and Maps, Entry into Survey Field Books and Level Books

3.2. **Leveling**

3.2.1. Methods of Leveling, Leveling Instruments and Accessories, Principles of Leveling

3.3. **Theodolite and Travers Surveying**

3.3.1. Basic Difference between Different Theodolites, Temporary Adjustments of Theodolites, Fundamental Lines and Desired Relations, Tachometry: Stadia Method, Trigonometrical Leveling, Checks in Closed Traverse

3.4. **Contouring**

3.4.1. Characteristics of Contour Lines, Method of Locating Contours, Contour Plotting, land surveying for airport site and contour plan for airport site

3.5. **Setting Out**

3.5.1. Buildings, Simple Curves, setting out of runway centerline, taxiway centerlines, Apron Layout, side stripe areas and other parts of airports

3.6. **Airport Survey**

3.6.1. Use of survey techniques in airport surveying, airport site selection

खण्ड (ख) – ५० अङ्क

4. Construction Materials for use of airport construction

4.1. **Stone**

4.1.1. Formation and Availability of Stones in Nepal, Methods of Laying and construction with Various Stones

4.1.2. Gravel as pavement sub-base, gradation, California Bearing Ratio (CBR)

4.1.3. Base-course materials and their gradation, Los Angeles Abrasion (LAA), Aggregate Crushing Value, California Bearing Ratio (CBR), Flakiness index and other laboratory testing for quality control of base course

4.1.4. Surface course material and their laboratory testing

4.2. **Cement**

4.2.1. Ingredients, Properties and Manufacturing Process, Storage and Transport, Admixtures

4.3. **Clay and Clay Products**

4.3.1. Brick Type, Manufacturing Process, Laying, Bonds, Tiles

4.4. **Paints and Varnishes and road marking paints**

4.4.1. Type and Selection, Preparation Techniques, Application

4.4.2. Runway, taxiway and apron marking

4.5. **Bitumen**

4.5.1. Type, Selection, Application, bitumen for asphalt concrete pavement

4.6. **Metals**

4.6.1. Steel, Alloys

4.7. **Other new coming construction materials**

5. Building Construction Technology

5.1. **Foundations**

5.1.1. Subsoil Exploration, Type and Suitability of Different Foundations Shallow, Deep, Shoring and Dewatering, Design of Simple Brick or Stone Masonry Foundations

5.2. **Walls**

5.2.1. Types of Walls and Their functions, Choosing Wall Thickness, height to Length Relation, Use of Scaffolding

5.3. **Damp Proofing**

5.3.1. Source of Dampness, Remedial Measures to Prevent Dampness

5.4. **Concrete Technology**

5.4.1. Constituents of Cement Concrete, Grading of Aggregates, Concrete Mixes, Water Cement Ratio, Factors Affecting Strength of Concrete, Form Work, Curing

5.5. **Wood Work**

5.5.1. Frame and Shutters of Doors and Windows, Design and Construction of Stairs

5.6. **Flooring and Finishing**

5.6.1. Floor finishes: Brick, Concrete, Flag Stone, Tiles, Granite, Marble

6. Estimating and Costing

6.1. **General**

6.1.1. Main Items of Work, Units of Measurement and Payment of Various Items of Work and Material, Specifications, Standard Estimate formats government Offices

6.2. **Rate Analysis**

6.2.1. Preparation of Rate Analysis Using Norms Prepared by The Ministry of

Physical Infrastructure and Transport (MoPIT), Department of Urban Development and Building Construction (DUDBC), and District Rates

7. Construction Management

7.1. **Organization**

7.1.1. Need for Organization, Responsibilities of a Civil Overseer, Relation Between Employer, Contractor and Engineer/Consultant

7.2. **Site management**

7.2.1. Preparation of Site Plan, Organizing Labour, Measures to Improve Labour Efficiency, Accident Prevention, Occupational Health and Safety, Aerodrome work safety in operational Airports

7.3. **Contract Procedure**

7.3.1. Contracts, Departmental Works and Day-Works, Types of Contracts, Tender and Tender Notice, Earnest Money and Security deposit, Preparation Before Inviting Tender, Agreement, Conditions of Contract, Construction Supervision

8. Computer Knowledge and Skills

8.1. MS-Word, MS-Excel, MS-Powerpoint

8.2. AutoCAD

8.3. Earthwork Calculation and Mass Haul Diagram

द्वितीय पत्रबाट निम्नानुसार प्रश्न सोधिनेछ :

खण्ड	अङ्कभार	विषयगत प्रश्न	
		छोटो उत्तर	लामो उत्तर
(क)	५०	६ प्रश्न X ५ अङ्क= ३०	२ प्रश्न X १० अङ्क= २०
(ख)	५०	६ प्रश्न X ५ अङ्क= ३०	२ प्रश्न X १० अङ्क= २०
जम्मा	१००	१२ प्रश्न X ५ अङ्क= ६०	४ प्रश्न X १० अङ्क= ४०