नेपाल नागरिक उड्डयन प्राधिकरण
प्राबिधिक सेवा, एरोनटिकल ईन्जिनियरिङ्ग समूह,
एयरवर्दिनेश इन्जिनियर, दशौं तहको खुला तथा आन्तरिक प्रतियोगितात्मक
परीक्षाको पाठ्यक्रम

लिखित परीक्षाको विषय, पूर्णाङ्क, परीक्षा प्रणाली, प्रश्नसंख्या, अंकभार र समय निम्नानुसार हुनेछ ।

पत्र	विषय	पूर्णाङ्क	परीक्षा प्रणाली	प्रश्न संख्या	अंक भार	समय
प्रथमपत्र	प्रशासन तथा व्यवस्थापन र ऐन नियम	१००	तर्कयुक्त विश्लेषणात्मक समस्या समाधान	२ x २०	४०	३ घण्टा
			विषयगत – छोटो प्रश्न	६ x १०	६०	
द्वितियपत्र	सेवा सम्वन्धी	१००	तर्कयुक्त विश्लेषणात्मक समस्या समाधान	२ x २०	४०	३ घण्टा
			विषयगत – छोटो प्रश्न	६ x १०	६०	

द्रष्टव्य :

१. प्रथमपत्र र द्वितीयपत्रको परीक्षा २ दिनमा हुनेछ ।

२. परीक्षाको माध्यम नेपाली वा अंग्रेजी वा दुवै हुनसक्ने छ ।

३. प्रत्येक पत्रको उत्तिर्णाङ्क ४०% (चालिस प्रतिशत) हुनेछ । दुवै पत्रमा न्यूनतम उत्तिर्णाङ्क प्राप्त नगर्ने उम्मेदवारहरु अन्तर्वार्तामा सम्मिलित हुन योग्य हुनेछैनन् ।

४. अन्तर्वार्ता र शैक्षिक योग्यता

क) अन्तर्वार्ताको अङ्क भार - ३०

ख) शैक्षिक योग्यताको अङ्कभार - ३

शैक्षिक योग्यता वापतको अङ्क : न्यूनतम शैक्षिक योग्यता वापत प्रथम श्रेणीलाई ३, द्वितीय श्रेणीलाई २ र तृतीय श्रेणीलाई १ अङ्क प्रदान गरिनेछ ।

५. यस पाठ्यक्रममा जेसुकै विषयवस्तु समावेश गरिएको भएतापनि पाठ्यक्रममा परेका कानुन, ऐन, नियम तथा नीतिहरु परीक्षाको मितिभन्दा ३ महिना अगाडि संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई कायम रहेकालाई यस पाठ्यक्रममा परेको संझनुपर्दछ ।

६. यस पाठ्यक्रममा उल्लेख भएका विषयहरुका अतिरिक्त समसामयिक घट्ना तथा विषयवस्तुहरुका सम्वन्धमा समेत प्रश्न सोध्न सकिनेछ ।

प्रथमपत्र : प्रशासन तथा व्यवस्थापन र ऐन नियम

क) प्रशासन तथा व्यवस्थापन

१. सार्वजनिक प्रशासनको परिचय, यसको प्रयोग र नवीनतम अवधारणा

२. प्रशासनिक विधिहरु :- कार्य विश्लेषण, कार्य विवरण, कार्य मूल्यांकन र छरितो व्यवस्थापन

३. नेपाल नागरिक उड्डयन प्राधिकरणको सांगठनिक संरचना र कार्यविधि

४. जनशक्ति व्यवस्थापनका विविध पक्षहरु

५. संगठनात्मक व्यवहार, समूहगत गतिशीलता, समूहगत कार्य र यसको प्रभावकारिता

६. व्यवस्थापनमा मनोवल, उत्प्रेरणा, बृत्तिविकास

७. व्यवस्थापनमा समन्वय, सुपरिवेक्षण, अनुगमन तथा मूल्यांकन

८. व्यवस्थापनमा अधिकार प्रत्यायोजन, संचार, समन्वय, सुपरिवेक्षण, अनुगमन तथा मूल्यांकन

९. व्यवस्थापनमा निर्णयको महत्व, निर्णय प्रक्रिया र पारदर्शिता

१०. व्यवस्थापन सूचना प्रणाली र महत्व

११. सार्वजनिक उत्तरदायित्व र संगठनमा यसको प्रभाव

१२. आर्थिक अनुशासन, लेखापालन र लेखापरीक्षण

१३. वार्ता, संझौता तथा मध्यस्थ गर्ने शीपहरु र मस्यौदा तयारी गर्ने सम्वन्धी सैद्धान्तिक र व्यवहारिक ज्ञान एवं चुनौतीहरु

१४. आवधिक योजना, परियोजना र कार्यक्रम तर्जुमा, कार्यान्वयन, अनुगमन, मूल्यांकन र नेपाल नागरिक उड्डयन प्राधिकरणमा यसको प्रयोग

१५. सार्वजनिक नीति तर्जुमा, विश्लेषण, कार्यान्वयन, अनुगमन र मूल्याकन

१६. नेपालमा संवैधानिक विकासका विभिन्न चरणहरुको विश्लेषण

१७. नेपाल नागरिक उड्डयन प्राधिकरणको उद्देश्य, कार्य, नेपाल सरकारसित सम्पर्क

१८. नेपालमा हवाई यातायातको विकासक्रम, सम्भावना र चुनौतीहरु

१९. विश्वव्यापीकरण, उदारीकरण र सार्वजनिक संस्थानको अवधारणा र प्रयोग

२०. हवाई नीति, २०६३

२१. Proficiency in using office application software

ख) ऐन नियम

१. नेपालको अन्तरिम संविधान, २०६३

२. नेपाल नागरिक उड्डयन प्राधिकरण ऐन, २०५३

३. नेपाल नागरिक उड्डयन प्राधिकरण कर्मचारीहरुको सेवाका सर्त र सुविधा सम्वन्धी नियमावली, २०५६

४. नेपाल नागरिक उड्डयन प्राधिकरण आर्थिक प्रशासन सम्वन्धी नियमावली, २०५७

५. नागरिक उड्डयन नियमवाली, २०५८

६. नेपाल नागरिक उड्यन प्राधिकरण विमानस्थल सेवा शुल्क नियमावली, २०६७७

७. हवाई सुरक्षा व्यवस्था नियमावली, २०४६

८. भ्रष्टाचार निवारण ऐन, २०५९

९. गैऱ्ह सैनिक हवाई उडान ऐन, २०१५ र नियमावली, २०५२

१०. करार सम्वन्धी कानूनी र प्रकृयागत व्यवस्था

११. सार्वजनिक खरिद ऐन, २०६३ र नियमावली २०६४

१२. विदेशी लगानी तथा प्रविधि हस्तान्तरण ऐन, २०४९

१३. जग्गा प्राप्ति ऐन, २०३४

१४. Convention on International Civil Aviation 1944.

द्वितीयपत्र : सेवा सम्वन्धी

1. MAINTENANCE PRACTICES AND PROCEDURES

1.1 Workshop Standard Practices

- Safety Precautions: Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils and chemicals.
- Instruction in the remedial action to be taken in the event of a fire or another accident with one or more of the above hazards including knowledge on extinguishing agents.

1.2 Avionic General Test Equipment

- Operation, function and use of avionic general test equipment.

1.3 Transmissions

- Inspection of gears, backlash;
- Inspection of belts and pulleys, chains and sprockets;
- Inspection of screw jacks, lever devices, push-pull rod systems.

1.4 Composite and non-metallic

- Bonding methods, practices and inspection of bonded joints.
- Environmental conditions;

1.5 Aircraft Weight and Balance

- Centre of Gravity/Balance limits calculation: use of relevant documents;
- Preparation of aircraft for weighing; Aircraft weighing.

1.6 Aircraft Handling and Storage

- Aircraft taxiing/towing and associated safety precautions;
- Aircraft jacking, chocking, securing and associated safety precautions;
- Aircraft storage methods;
- Refueling/defueling procedures;
- De-icing/anti-icing procedures;
- Electrical, hydraulic and pneumatic ground supplies.
- Effects of environmental conditions on aircraft handling and operation.

1.7 Inspection and Repair Techniques

- Corrosion removal, assessment and reprotection;
- Ageing, fatigue and corrosion control programmes;
- Non-destructive inspection techniques including, penetrant, radiographic, eddy current, ultrasonic and boroscope methods;
- Trouble shooting techniques.

1.8 Abnormal Events

- Inspections following lightning strikes and HIRF penetration;
- Inspections following abnormal events such as heavy landings and flight through turbulence.

1.9 Maintenance Procedures

Maintenance planning;

- Modification procedures;
- Stores procedures;
- Certification/release procedures;
- Maintenance Inspection/Quality Control/Quality Assurance;
- Control of life limited components.

2. DIGITAL TECHNIQUES/ELECTRONIC INSTRUMENT SYSTEMS

2.1 Electronic Instrument Systems

- Typical systems arrangements and cockpit layout of electronic instrument systems.

2.2 Numbering Systems

- Numbering systems: binary, octal and hexadecimal;
- Demonstration of conversions between the decimal and binary, octal and hexadecimal systems and vice versa.

2.3 Data Conversion

- Analogue Data, Digital Data;
- Operation and application of analogue to digital, and digital to analogue converters, inputs and outputs, limitations of various types.

2.4 Data Base

- Operation of data base in aircraft systems, including knowledge of ARINC and other specifications.
- Aircraft Network/Ethernet.

2.5 Logic Circuits

- Identification of common logic gate symbols, tables and equivalent circuits;
- Applications used for aircraft systems, schematic diagrams.

2.6 Basic Computer Structure

- Computer terminology (including bit, byte, software, hardware, CPU, IC, and various memory devices such as RAM, ROM, PROM);
- Computer technology (as applied in aircraft systems).

2.7 Fibre Optics

- Advantages and disadvantages of fibre optic data transmission over electrical wire propagation;
- Fibre optic data bus;
- Fibre optic related terms;
- Terminations;
- Couplers, control terminals, remote terminals;
- Application of fibre optics in aircraft systems.

2.8 Electronic Displays

- Principles of operation of common types of displays used in modern aircraft, including Cathode Ray Tubes, Light Emitting Diodes and Liquid Crystal Display.

2.9 Electrostatic Sensitive Devices

- Special handling of components sensitive to electrostatic discharges;
- Awareness of risks and possible damage, component and personnel anti-static protection devices.

2.10 Software Management Control

- Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programmes.

2.11 Electromagnetic Environment

- Influence of the following phenomena on maintenance practices for electronic system:
  - Electromagnetic Compatibility (EMC);
  - Electromagnetic Interference (EMI);
  - High Intensity Radiated Field Lightning (HIRF)/lightning protection.

2.12 Typical Electronic/Digital Aircraft Systems

- General arrangement of typical electronic/digital aircraft systems and associated BITE (Built In Test Equipment) such as:
  - Communication and Addressing and Reporting System (ACARS – ARINC);
  - Engine Indication and Crew Alerting System (EICAS);
  - Fly-by-Wire (FBW);
  - Flight Management System (FMS);
  - Inertial Reference System (IRS).
  - Electronic Centralized Aircraft Monitoring(ECAM);
  - Electronic Flight Instrument System (EFIS);
  - Global Positioning System (GPS);
  - Traffic Alert Collision Avoidance System (TCAS);
  - Integrated Modular Avionics Cabin Systems Information Systems.

3. AVIATION LEGISLATION

3.1 Regulatory Framework

- Role of the International Civil Aviation Organization;
- The Convention on International Civil Aviation;
- International Standards, particularly: Annex 1, Chapter 4, and Annex 6, Part I Chapters 8 and 11, and Part II Chapter 8;
- Role of the Civil Aviation Authority of Nepal;
- Civil Aviation Act(1959), Civil Aviation Authority Act (1996), Civil Aviation Rules(1996) and Civil Aviation Authority Regulations (2002) and amendments made thereto;

3.2 Approved Maintenance Organizations

- NCAR Part-145 and Part-M Subpart F.

3.3 Certifying Staff — Maintenance

- NCAR Part-66.

3.4 OPS – Commercial Air Transportations

The candidate should have a detailed knowledge of:

- General understanding of EU-OPS.
- Air Operators Certificates;

- Operator's responsibilities, in particular regarding continuing airworthiness and maintenance;
- Aircraft Maintenance Programme;
- Minimum Equipment List/Configuration Deviation List (MEL//CDL);
- Documents to be carried on board;
- Aircraft placarding (markings).

3.5 Aircraft Certification

a. General

- Certification Rules: Type Certificate, Supplementary Type Certificate;
- NCAR Part – 21 Design/Production Organization Approvals.

b. Documents

- Certificate of Airworthiness;
- Permit to fly;
- Certificate of Registration;
- Noise Certificate;
- Weight and Balance Schedule;
- Radio Station Licence.

3.6 Continuing airworthiness

- NCAR Part – 21 provisions related to continuing airworthiness.
- NCAR Part-M Subpart F.

3.7 Applicable National and International Requirements for:

- Maintenance Programmes,
- Maintenance checks and inspections;
- Airworthiness Directives;
- Service Bulletins, manufacturers service information;
- Modifications and repairs;
- Maintenance documentation: maintenance manuals, structural repair manual, illustrated parts catalogue, etc.;
- Continuing airworthiness; Test flights;
- ETOPS, maintenance and dispatch requirements;
- All Weather Operations, Category 2/3 operations and Minimum equipment requirements.

4. HUMAN FACTORS

4.1 General / Introduction to human factors

- Need to address human factors
- Statistics
- Incidents

4.2 Safety Culture / Organisational Factors

Safety Culture / Organisational Factors

4.3 Human Error

- Error models and theories
- Types of errors in maintenance tasks
- Violations
- Implications of errors
- Avoiding and managing errors
- Human reliability

4.4 Human performance & limitations

- Vision
- Hearing
- Information-processing
- Attention and perception
- Situational awareness
- Memory
- Claustrophobia and physical access
- Motivation
- Fitness/Health
- Stress
- Workload management
- Fatigue
- Alcohol, medication, drugs
- Physical work
- Repetitive tasks / complacency

4.5 Environment

- Peer pressure
- Stressors
- Time pressure and deadlines
- Workload
- Shift Work
- Noise and fumes
- Illumination
- Climate and temperature
- Motion and vibration

- Complex systems
- Hazards in the workplace
- Lack of manpower
- Distractions and interruptions

4.6 Procedures, information, tools and practices

- Visual Inspection
- Work logging and recording
- Procedure – practice / mismatch / norms
- Technical documentation – access and quality

4.7 Communication

- Shift / Task handover
- Dissemination of information
- Cultural differences

4.8 Teamwork

- Responsibility
- Management, supervision and leadership
- Decision making

4.9 Professionalism and integrity

- Keeping up to date; currency
- Error provoking behaviour
- Assertiveness

4.10 Organisation's human factor program

- Reporting errors
- Disciplinary policy
- Error investigation
- Action to address problems
- Feedback

5. SAFETY MANAGEMENT SYSTEM

5.1 Safety

- Defining safety;
- Safety process: gathering data, identifying & evaluating safety problems, and implementing changes.

5.2 Maintenance Safety Program

- Maintenance safety, Ramp safety, Foreign object damage.

5.3 Emergency preparedness & response

- Accident investigation & crisis communication

5.4 Maintenance Safety

- Communication, Maintenance personnel, Maintenance Organization, Maintenance Program, Reduction of maintenance error

6. AIRWORTHINESS SAFETY OVERSIGHT

6.1 Objective of Airworthiness Safety Oversight

Objective of Airworthiness Safety Oversight

6.2 Means of Airworthiness Safety Oversight

Means of Airworthiness Safety Oversight

6.3 Airworthiness Audit

6.3.1 Team Composition

Audit Manager

- Team Leader
- Observer
- Attributes of the Auditing Inspector
- Conflict of Interest and Confidentiality

6.3.2 Phases of the Audit

(a) The Initiation Phase

- Establishing the 'Need for Audit'
- Team Selection
- Team Preparation:
  — Audit Plan;
  — Pre-audit Team Meeting

(b) The Audit Execution Phase

- Pre-audit Meeting
- The Audit
- The Audit Check List
- The Three Main Steps: Observation; Interview; Some valuable Don'ts
- Sampling
- Recording and Documenting
- Analysis of Findings
- Audit Findings
- Levels of Audit Findings: Level 1, Level 2 and Level 3 Findings
- Confirmation Request
- Corrective Action Request
- Follow–up and Closure Report

- Audit Record Log
- Communication during the Audit
- Post Audit(Exit) Meeting

(c) The Post Audit Phase

The Audit Report

- Parallel Report
- Audit Correction Action Proposals
- Audit Report Retention

6.3.3 Monitoring the Follow Up

- Monitoring the Follow Up

6.3.4 Setting Audit Frequency

Resource Allocation

- Criteria
- Risk Indicators
- Periodic Cycle

7. Maintenance Planning of CNS and security equipments

a. Periodic/Routine Plan

b. Recurrent Plan

c. Emergency Plan

d. Replacement Plan

e. Transitional Plan

f. Risk Analysis

g. Cost Benefit Analysis