

नेपाल नागरिक उड्डयन प्राधिकरण
प्राबिधिक सेवा, सिभिल एभिएसन समूह, फ्लाइट अपरेशन सर्भिसेज उपसमूह, प्रवन्धक (पाइलट), नवौं तहको
खुला/आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

पाठ्यक्रमको रूपरेखा :- यस पाठ्यक्रमको आधारमा निम्नानुसार चरणमा परीक्षा लिइने छ :

प्रथम चरण :- लिखित परीक्षा पूर्णाङ्क :- २००

द्वितीय चरण :- अन्तर्वार्ता पूर्णाङ्क :- ३०

१. प्रथम चरण : - लिखित परीक्षा						पूर्णाङ्क :- २००
पत्र	विषय	पूर्णाङ्क	उतीर्णाङ्क	परीक्षा प्रणाली	प्रश्नसंख्या X अङ्क	समय
प्रथम	व्यवस्थापन तथा कानून	100	40	विषयगत	६ प्रश्न X १० अङ्क = ६० अङ्क	३ घण्टा
					२ प्रश्न X २० अङ्क = ४० अङ्क (समस्या समाधान)	
द्वितीय	सेवा सम्बन्धी	100	40	विषयगत	६ प्रश्न X १० अङ्क = ६० अङ्क	३ घण्टा
					२ प्रश्न X २० अङ्क = ४० अङ्क (समस्या समाधान)	
२. द्वितीय चरण : - अन्तर्वार्ता						पूर्णाङ्क :- ३०
विषय		पूर्णाङ्क	उतीर्णाङ्क	परीक्षा प्रणाली		
अन्तर्वार्ता		30	-	मौखिक		

द्रष्टव्य :

- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।
- प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
- लिखित परीक्षामा यथासम्भव पाठ्यक्रमका सबै एकाईबाट प्रश्नहरू सोधिनेछ ।
- विषयगत प्रश्नमा प्रत्येक पत्र/विषयका प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन् । परिक्षार्थीले प्रत्येक खण्डका प्रश्नहरूको उत्तर सोही खण्डका उत्तरपुस्तिकामा लेख्नुपर्नेछ ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भए तापनि पाठ्यक्रममा परेका कानून, ऐन, नियम तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।
- पाठ्यक्रम लागू मिति :- २०७८/१२/२९

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ज्ञप्रथम पत्र :- व्यवस्थापन तथा कानून

खण्ड क - (५० अङ्क)

1. सार्वजनिक व्यवस्थापन

- 1.1 सार्वजनिक व्यवस्थापन : परिचय, कार्यक्षेत्र, नवीनतम अवधारणा, विद्यमान चुनौती तथा समाधानका उपायहरू
- 1.2 प्रशासनिक विधिहरू (कार्य विश्लेषण, कार्य विवरण, कार्य मूल्याङ्कन, कार्य विस्तृतिकरण, कार्य ढाँचा, संगठन तथा व्यवस्थापन पद्धति, व्यवस्थापकीय परीक्षण)
- 1.3 संगठनको परिचय, स्वरूप, सिद्धान्त तथा संगठन गठनका आधारहरू
- 1.4 संगठनका केही प्रमुख पक्षहरू: संगठनात्मक व्यवहार, समूह गतिशिलता र समूहगत कार्य
- 1.5 संगठनमा संचार, समन्वय, सुपरिवेक्षण, अनुगमन तथा मूल्यांकनको महत्व
- 1.6 व्यवस्थापनको अवधारणा, प्रकार र आधारभूत सिद्धान्तहरू
- 1.7 कुशल व्यवस्थापकका कार्य र गुणहरू
- 1.8 व्यवस्थापकीय सीप र शैलीहरू
- 1.9 मानव श्रोत व्यवस्थापन : प्राप्ति, विकास, उपयोग र सम्भार
- 1.10 व्यवस्थापनमा निर्देशन, नियन्त्रण, अधिकार प्रत्यायोजन, निर्णय प्रक्रिया र नेतृत्व
- 1.11 व्यवस्थापनका केही प्रमुख पक्षहरू : कार्यसम्पादन मूल्याङ्कन, द्वन्द्व व्यवस्थापन, तनाव व्यवस्थापन, समय व्यवस्थापन, प्रकोप व्यवस्थापन, संकट व्यवस्थापन, परिवर्तन व्यवस्थापन, गुनासो व्यवस्थापन, श्रमिक संगठन (Trade Union) र सामुहिक सौदावाजी (Collective Bargaining), सम्पूर्ण गुण व्यवस्थापन (Total Quality Management)
- 1.12 वार्ता तथा संझौता सम्बन्धी सैद्धान्तिक र व्यवहारिक ज्ञान
- 1.13 व्यवस्थापन सूचना प्रणाली र संगठनमा महत्व
- 1.14 सार्वजनिक नीति तर्जुमा, कार्यान्वयन र मूल्यांकन प्रशासनको भूमिका
- 1.15 योजनाको परिचय, तर्जुमाका चरणहरू र नेपालमा आवधिक योजना वारे सामान्य जानकारी
- 1.16 सार्वजनिक सेवाको अवधारणा, कार्य, विशेषता र भूमिका
- 1.17 सार्वजनिक सेवा प्रवाह र सार्वजनिक सेवा वडापत्र
- 1.18 विश्व व्यापीकरण, उदारीकरण र सार्वजनिक संस्थानको अवधारणा र प्रयोग
- 1.19 विमानस्थल व्यवस्थापनका नयाँ अवधारणाहरू वारे जानकारी
 - सार्वजनिक निजी साझेदारी (PPP) माध्यमबाट निजीकरण व्यवस्था
 - व्यवस्थापन करार (Management Contract)
 - कर्पोरेटाइजेशन
 - निर्माण, स्वामित्व, संचालन, हस्तान्तरण (BOOT)
 - स्थानीय तहमा हस्तान्तरण र संचालन
- 1.20 आर्थिक प्रशासनको अर्थ, क्षेत्र, प्रमुख कार्यहरू र महत्व
- 1.21 बजेट तर्जुमा, कार्यान्वयन, मूल्याङ्कन प्रक्रिया र बजेट चक्र
- 1.22 आर्थिक विकासमा सार्वजनिक, निजी र सहकारी क्षेत्रको भूमिका

खण्ड ख - (५० अङ्क)

2. ऐन, नियम र नीति

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- 2.1 नेपालको वर्तमान संविधान
- 2.2 नेपाल नागरिक उड्डयन प्राधिकरण ऐन, २०५३
- 2.3 नागरिक उड्डयन नियमावली, २०५८
- 2.4 नेपाल नागरिक उड्डयन प्राधिकरण कर्मचारीहरूको सेवाका शर्त र सुविधा सम्बन्धी नियमावली, २०५६
- 2.5 नेपाल नागरिक उड्डयन प्राधिकरण आर्थिक प्रशासन सम्बन्धी नियमावली, २०५७
- 2.6 नेपाल नागरिक उड्डयन प्राधिकरण विमानस्थल सेवा शुल्क नियमावली, २०६७
- 2.7 नागरिक उड्डयन सुरक्षा नियमावली, २०७३
- 2.8 विदेशी लगानी तथा प्रविधि हस्तान्तरण ऐन, २०४९
- 2.9 भ्रष्टाचार निवारण ऐन, २०५९
- 2.10 प्रतिलिपि अधिकार सम्बन्धी ऐन, २०५९ र नियमावली, २०६१
- 2.11 विधुतीय कारोबार ऐन, २०६३
- 2.12 सूचनाको हक सम्बन्धी ऐन, २०६४ र नियमावली, २०६५
- 2.13 सार्वजनिक खरिद ऐन, २०६३ र नियमावली, २०६४
- 2.14 हवाई नीति, २०६३
- 2.15 सूचना प्रविधि नीति, २०६७
- 2.16 विज्ञान प्रविधि नीति, २०६०
- 2.17 नेपाल नागरिक उड्डयन प्राधिकरणको संगठनात्मक संरचना, उद्देश्य र कार्यक्षेत्र
- 2.18 नेपालमा हवाई यातायातको विकासक्रम र चुनौतीहरू
- 2.19 अन्तर्राष्ट्रिय नागरिक उड्डयन संगठन (ICAO), अन्तर्राष्ट्रिय हवाई यातायात संघ (IATA) र अन्य उड्डयन सम्बन्धित क्षेत्रिय संगठन बारे जानकारी

प्रथम पत्रको लागि यथासम्भव निम्नानुसार प्रश्नहरू सोधिने छ ।

प्रथम पत्र (विषयगत)				
विषय	खण्ड	अङ्कभार	लामो उत्तर	समस्या समाधान
व्यवस्थापन तथा कानून 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

द्वितीय पत्र : सेवा सम्बन्धी
Group A (40 Marks)

A. AIRCRAFT AND SYSTEM

1.1 Airframe And Systems

Types and construction of airframes, Aerofoils, Control surfaces, types and uses, Flight controls, types and uses, Principle of operation and construction of piston and turbine engines, Basic Lubrication, hydraulic electrical and fuel system of general aircraft, Operational procedures and limitations of power plants, Principle of operation of movable airfoils.

Jet Propulsion, Flight at transonic and supersonic speeds. Difference between turboprop and jet engine aircraft. Different aspect of jet engine aircraft operations.

1.2 Aerodynamics

Newton's Laws of motion and their application in aircraft flying, Bernoulli's principle and application, Lift-causes, factors affecting lift, Drag-causes, factors affecting drag, Thrust-causes, factors affecting thrust, Weight-factors affecting the gravity (load factors), Components of lift, drag, thrust and weight (gravity), Circular motion- theory, practical usefulness in aircraft flying, equilibrium, stability, instability of forces acting on aircraft, Factors affecting stability, stalls, turns, climb, descent, load factors, Various conditions of flight and the forces acting on it.

1.3 Aircraft Instruments

Basic flight instruments, principle of operation and practical uses, Basic navigation instruments for VFR flights, principle of operation and practical uses. Basic engine instruments, principle of operation and practical uses, Pictorial interpretation of the cockpit instruments, Gyroscopic and pressure instruments.

1.4 Aircraft Performance

Aircraft performance, definition and practical use., Factors affecting aircraft performance, Use of various performance charts, Weight and balance-computation and practical uses, Factors affecting C of G, Computation of landing distance, take-off distance, climb and descent using performance charts. Limitation of aircraft operation.

1.5 Flight Planning

Preparation of a flight plan, Computation of fuel plan, Computation of headings, ground-speeds, time en-route (EET), true airspeed, wind velocities, Selection of routes (IFR/VFR), Necessity of obtaining weather briefing, Alternate course.

Chart plotting, checking of AIP, NOTAMS, Radio planning practice, Interpretation of aerodrome chart.

B. AIR NAVIGATION

1.1 Basic Navigation

The earth, Great circles, small circles, rhumb lines, Latitudes, longitudes, and its uses in air navigation, Directions- compass, true and magnetic, definitions, their interrelationship and uses, Magnetic compass (Principle of operation and limitations)

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1.2 Dead Reckoning

Fundamentals of dead-reckoning., Practical application of track, heading, wind, speeds (airspeed, groundspeed), Computation of EET, ETA, groundspeeds, airspeeds, Computation of drift, wind correction angle, Determining DR, position fix.

1.3 Navigational Computer

Practical application of navigational computer, Computation of various speeds, time enroute (EET, ETA), distances, headings, wind, fuel consumption etc., Triangle of velocities, its practical use in air navigation.

1.4 Charts

General properties of various types of projections, Representation of meridians, parallels, great circles and rhumb line, Use of aeronautical charts.

1.5 In-Flight Navigation

Navigation during climb and descent regime of flight, Navigation in cruise flying. Use of fixes to revise navigation data e.g. speed, track, wind, EET and ETA and others etc, Computation of speed, distance, time, fuel etc associated with climb descent and cruise phase of flight.

C. METEOROLOGY

1.1 The Atmosphere and Physical Process

Composition, extent and vertical division, Pressure, density and temperature. Variation of pressure, density and temperature and their effects on the weather. Adiabatic processes, dry air, evaporation, condensation, latent heat, saturated and unsaturated air, inversions and their influences on the weather, Stability, instability of air and weather associated to it, Lapse rate, vertical distribution of temperature and density.

1.2 Humidity and Precipitation

Humidity in atmosphere and its effect on density, Humidity variation and weather associated with it, Condensation, precipitation, sublimation and freezing in atmosphere, Precipitation, its characteristics and development.

1.3 Clouds

Types and classification of clouds, Principle of formation of clouds and its modifications, Flying characteristics in different types of clouds, Cooling by advection, radiation and adiabatic expansion, Characteristics of all clouds. Hazards to flying by various clouds.

1.4 Motion of Atmosphere

Relationship between isobars and wind, Fundamental cause of wind, pressure gradient, Coriolis force, geotropic and cyclostrophic winds, Convergence and divergence effects, Local winds (Foehn, anabatic, catabatic winds, land and sea breezes and others), Variation of wind with height, Thermal component of wind. Origin of jet streams and standing waves, Mountain waves, Wind shear.

1.5 Surface Weather

Formation of fog, mist, haze, Effect on weather by haze, fog and mist. Effect on visibility due to fog, mist, haze, blowing sand, snow or dust etc, Types of fog and source of their origin.

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1.6 Air Masses

Description, factors affecting the properties of an air mass, Classification of air masses, modification due to various factors and their area of origin, Fronts, Warm, cold, occluded, Stationary fronts, associated clouds and weather, Frontal depressions, non frontal depressions and associated weather, Electricity in atmosphere, Movement of fronts, Turbulence, thunderstorm, squall lines.

1.7 Weather Observation

Weather charts, Ground observation, Pilot observation, Significant of weather charts, Weather forecast.

D. HUMAN FACTOR

1.1 General / Introduction to human factors

- Need to address human factors
- Statistics
- Incidents

1.2 Safety Culture / Organizational Factors

- Safety Culture / Organizational Factors

1.3 Human Error

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

1.4 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

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खुला/आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

1.5 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

1.6 Procedures, information, tools and practices

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

1.7 Communication

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

1.8 Teamwork

- Responsibility
- Management, supervision and leadership
- Decision making

1.9 Professionalism and integrity

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

1.10 Organization's human factor program

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

1.11 Flying and Health

Causes and symptoms of incapacitation, Side effects of drug and medication, Procedures for dealing with incapacitation, Various toxic materials, alcohol, smoking, Effects of disturbances and treatment, Causes, types, symptoms, prevention and treatment of fatigue, Effects of anxiety and defense mechanism. Common minor ailments, Tropical climates.

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खुला/आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

1.12 Integration of Sensory Inputs

Basic concepts and definition, Categories of disorientation, Vertigo, Coriolis effect, pressure vertigo, flicker vertigo, Visual illusions, Prevention and handling of disorientation, Effects of stress and time of day.

1.13 Altitude Flying

Respiration and blood circulation, Hypoxia, definition, causes, symptoms and remedy, Time of useful consciousness, Definition, causes of hyperventilation. Symptoms and remedy of hyperventilation, Blood pressure, The gas Laws, Rapid decompression, effects and counter measures, Entrapped gases.

1.14 Human Information Processing

Central and peripheral nervous system, Mechanism of perception, constancies, selective perception, Reflexes and biological control systems, Functional anatomy of eye, Physiology of visual system, Night vision, Functional anatomy of ear, Hearing loss (perceptive, conductive), Detection of rotary and linear acceleration, Motion sickness.

E. BASIC INSTRUMENT FLYING PTOCEDURES

1.1 Basic Instrument Environment

Fundamentals of instrument flying, Pitch instrument, Yaw instrument, Roll instrument, Power instrument, Primary and supporting instruments, Cross checking of instruments, Gyroscopic, and pilot-static instruments, Causes and prevention of disorientation.

1.2 Attitude Flying

Flying with reference to instruments, Recognition of deviation from required flying attitudes, Establishing coordinated turns, climbs and descents at various speeds, and power settings, Definitions of standard rate of turn, V-speed and others associated with instrument flying, Relation between speed, power and attitude of aircraft. Maintaining constant attitude, Change of attitude, Pictorial interpretations.

1.3 Navigation

Orientation to radio navigational aids, Bearings, Interception, tracking of bearings. Way points, Minimum IFR altitudes, Alternate course of action, RADAR & Non RADAR environment, Pictorial Interpretation.

1.4 IFR Charts

Basic concept of charts, Aerodrome charts, Departure charts, En-route navigation charts, Approach charts, Identification of initial, intermediate and final approach fixes, Deriving information from charts, Determination of MRA, MOCA, MSA, MEA from the charts

1.5 Standard Instrument Departures/Arrivals

Use of radio navigational aids, Operating minima, Clearance limits, Runway lights and markings, Taxiway lights and markings, Threshold lights and markings, Touch down zone light and markings, Approach lights, Aerodrome beacon, RVR, Computation of speeds versus heights, Decision heights, minimum descent altitudes, Approach fixes, Holding patterns and entry procedures and speeds to be maintained while holding, Procedures to be followed to make SIA and SIDs.

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1.6 Emergency Procedures

Emergency reference data, Emergency communication procedures, Deviations from flight plan, Lost procedures, Choice of alternate, Communication failure procedures, Partial panel flights, Power plant failures, Vision adaptation, Unusual attitudes.

1.7 Fundamental

Basic radio theory, Waves, and wave transmission, Radio waves, Characteristics of radio wave propagation, Frequency, frequency bands, Current, Reception, transmission of radio waves/signals and disturbances to it, Types of radio aids to navigation.

1.8 VOR

Principle of operation, Bearings (Radial), To, From indication and uses, Position of aircraft in relation to radial, Components of VOR receiver, functions and uses, Accuracy, Limitations, Errors, Pictorial interpretation, Tests.

1.9 DME

Principle of operation, DME arcs and indication, DME distances, Difference between DME distance and actual distance, Components of DME receiver, Pictorial interpretation, Frequency band, Accuracy, Limitations, Errors, Test of DME receiver.

1.10 NDB

Principle of operation, Bearings, QDM, QD, Position of aircraft in relation to bearing, Components of ADF receiver, Differences between ADF & VOR, Fixed card and routable card type indicators, Pictorial interpretation, Limitations, Errors, Accuracy, Frequency band.

1.11 ILS

Ground facilities involved, ILS identification, ILS and VOR differences, Sources of azimuth information and utilization, Sources of range information and utilization, Sources of height information and utilization, Runway environment indicating systems, Back course and front course approaches, Approaches with one or more ILS components unserviceable, Limitations, Errors, Accuracy, Frequency bands, Pictorial interpretation.

1.12 RADAR

Concept of RADAR Principle of operation of RADAR, Types of RADAR, Uses of RADAR in navigation, Uses of RADAR in approaches, Frequency band, Limitations, Accuracy.

1.13 INS, GPS, GNSS

Fundamental principle of operation, Uses in air navigation, Uses in approaches, Sources of information.

1.14 RADIOTELEPHONY

- a) Radiotelephony Procedure and Phraseology as applied to VFR operation, Action to be taken in case of communication failure.

Group B (60 Marks)

OPERATIONAL PROCEDURES

- 1.1** Formulation of Nepalese Aviation Regulations and requirements with respect to the Chicago Convention and its associated Annexes

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- 1.2 Global Aviation Safety Roadmap (GASR) of ICAO and Nepal's commitment.
- 1.3 Universal Safety Oversight Audit of ICAO in the context of Nepalese Civil Aviation Authority.
- 1.4 Air incident / accident investigation and the role of Flight Operations responsibilities, contributions and challenges. ANNEX 13
- 1.5 Process and procedures for the issuance and renewal of Air Operator Certificates with respect to Annex 6 and CAAN's Air Operator Certificate Requirements.
- 1.6 Flight Operations Regulatory Audit processes and procedures of air operators.
- 1.7 Sports and recreational aviation in Nepal – opportunities and challenges
- 1.8 Fatigue Risk Management in Flight operations and FRMS DOC 9966.
- 1.9 Procedures for Root Cause Analysis in Flight Operations.
- 1.10 Human resource development in Flight Operations – requirements, capability and shortcomings.
- 1.11 Short term and long term planning of Flight Operations in terms of aviation growth in Nepal.
- 1.12 **ICAO Annex and CAAN Requirements:**
 - a. Nepalese Civil Airworthiness Requirement (NCAR)
 - b. Aeronautical Information Publication (AIP)
 - c. Personnel of Licensing ANNEX 1, Personnel Licensing Requirement (PELR)
 - d. Rules of the Air ANNEX 2
 - e. Operations of Aircraft ANNEX 6, Flight Operations Requirement (FOR)
 - f. Air Traffic Services ANNEX 11
 - g. Security ANNEX 17 and National Civil Aviation Security Program of Nepal.
 - h. The safe transport of dangerous goods by air ANNEX 18
 - i. Manual on flight data analysis program DOC 10000
 - j. Performance base navigation manual DOC 9613, RNP Procedures
 - k. Policy and guidance material of the economic regulation of international air transport DOC 9587
 - l. Safety Management manual DOC 9859, Civil Aviation Requirement 19 (CAR 19).