Nepal Airlines Corporation
Syllabus for Senior Technical Officer Grade- VII
Aircraft Maintenance Service (Airframe & Engine)
Open Competition

Stages and Procedure of Examination System

First Stage: Written Examination - Full Marks 200
Weightage Allocation and Marks Distribution

S.N.	Paper	Subject	Time	Full Mark	Section	Marks
1	I	Institutional Knowledge and Management	3 Hrs.	100	Section "A" Institutional Knowledge	Long Answer 3x10 =30 Short Answer 4x5 =20
					Section "B" Management	Long Answer 3x10 =30 Short Answer 4x5 =20
2	II	Service Related	45 Min.	100	Multiple Choice Questions	50x2=100

Second Stage - Interview

Individual Interview — Full Marks - 30

द्रष्टव्य :

१. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी वा दुबै हुनेछ ।
२. प्रथम, द्वितीय र तृतीयपत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
३. लिखित परीक्षामा यथासम्भव पाठ्यक्रमका सबै एकाइबाट प्रश्नहरु सोधिनेछ ।
४. वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरुको गलत उत्तर दिएमा प्रत्येक गलत उत्तर वापत २० प्रतिशत अङ्क कट्टा गरिनेछ तर उत्तर नदिएमा त्यस बापत अङ्क दिइने छैन र अङ्क कट्टा पनि गरिने छैन ।
५. विषयगत प्रश्नमा प्रत्येक पत्र/विषयका प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तर पुस्तिकाहरु हुनेछन् । परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरुको उत्तर सोही खण्डका उत्तर पुस्तिकामा लेख्नुपर्नेछ ।
६. यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भए तापनि पाठ्यक्रममा परेका कानून, ऐन, नियम तथा नीतिहरु परीक्षाको मितिभन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाइएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
७. प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।
८. यस भन्दा अगाडि लागू भएका माथि उल्लिखित सेवा/समूहको पाठ्यक्रम खारेज गरिएको छ ।
९. पाठ्यक्रम लागू मिति :– २०७९।०५।०४

Paper I

Subject: Institutional Knowledge and Management

Full Marks: 100
Time: 3 Hrs.

खण्ड (क) :- संस्थागत ज्ञान (५० अङ्क)

१. संस्थागत ज्ञान : (२X१०) + (२X५) = ३० अङ्क

१.१ नेपाल वायुसेवा निगमको स्थापनाको उद्देश्य, संगठनात्मक संरचना, कार्यक्षेत्र समस्या र चुनौती
१.२ नेपाल वायुसेवा निगमको पुनर्संरचनाको आवश्यकता र औचित्य
१.३ नेपाल वायुसेवा निगमबाट प्रवाह हुने सेवाको गुणस्तर, गुणस्तर नियन्त्रण तथा सेवाग्राहीको सन्तुष्टि तथा सेवाको मूल्य निर्धारण सम्बन्धी व्यवस्था
१.४ अन्य वायुसेवाहरु सँगको प्रतिस्पर्धा, चुनौती तथा भावी कार्यदिशा
१.५ अन्तर्राष्ट्रिय नागरिक उड्डयन संगठनको स्थापना, लक्ष्य तथा उद्देश्य
१.६ नेपाल नागरिक उड्डयन प्राधिकरणको स्थापना, लक्ष्य, उद्देशय, कार्यहरु र नियमनकारी भूमिका
१.७ नेपालमा सार्वजनिक संस्थानको आवश्यकता, उद्देश्य, स्वायत्तता, उत्तरदायित्व, समस्या र चुनौती
१.८ संस्थागत सुशासनको अवधारणा र नेपाल वायुसेवा निगमको संस्थागत सुशासनको अवस्था
१.९ आवधिक योजनामा हवाई क्षेत्र

२. संविधान र सम्वद्ध कानूनहरु (१X१०) + (२X५) = २० अङ्क

२.१ नेपालको वर्तमान संविधानको मौलिक हक र कर्तव्य, नीति तथा दायित्व, राज्यका निर्देशक सिद्धान्तहरु
२.२ नेपाल वायुसेवा निगम ऐन, २०१९
२.३ नेपाल वायुसेवा निगमका कर्मचारीहरुको सेवा, शर्त सम्बन्धी विनियमावली
२.४ सुशासन (व्यवस्थापन तथा सञ्चालन) ऐन, २०६४ र सुशासन (व्यवस्थापन तथा सञ्चालन) नियमावली, २०६५
२.५ सार्वजनिक खरिद ऐन, २०६३

खण्ड (ख) :- व्यवस्थापन (५० अङ्क)

3. General Management (1 X 10) + (2 X 5) = 20 Marks

3.1 Modern Approaches to Management
3.2 Motivation, Leadership, Control, Coordination and Team Work
3.3 Role of Manager and Managerial Functions
3.4 Managerial Decision Making and Problem Solving
3.5 Managing Workforce Diversity
3.6 Succession Planning
3.7 Quality management and TQM Techniques

4. Organizational Change and Development (1 X 10=10 Marks)

4.1 Concept of Organizational Change
4.2 Forces of Organizational Change
4.3 Resistance to Change and Overcoming the Resistance to Change
4.4 Concept and Characteristics of Organizational Development

4.5 General Concept and Dimensions of Development
4.6 Project Management: Use of Network Models like CPM, PERT, Manpower Planning and Resource Scheduling, Project Monitoring and Control, Project Cycle

5. Application of IT in Office Management (2 X 5=10 Marks)

5.1 Basic Knowledge of IT
5.2 Role of IT in Employee and Organizational Performance
5.3 Use of IT in HRM and Accounting System of Nepal Airlines Corporation

6. Management Information System (MIS) (1X 10 =10 Marks)

6.1 Information and Decision Making
6.2 Role and Importance of MIS
6.3 Impact of Information System in the Organization and the Society
6.4 MIS as a Tool for Management Process

Paper II
Subject: Service Related

Full Marks: 100 (Multiple Choice Questions 50x2)
Time: 45 Min.

1. FUNDAMENTALS (12x2=24 Marks)

a. Historical development: Classes of computer, historical development of computers, generation of electronics computers.
b. Computer systems and organization: Computer hardware, computer software.
c. Circuit elements: functional behavior of resistors, capacitors and inductor: Voltage and current sources.
d. Series and parallel circuits: Kirchhoff's law, Network analysis. Single phase AC circuit analysis. Power and energy in AC Circuits, Three phase circuits analysis – basics.
e. Introduction to instrumentation: The oscilloscope and its operation, digital voltmeter, ammeter, ohmmeter.
f. Circuit concepts: diodes and diode circuit, semi conductor devices.
g. Engineering Static: Equivalent force systems; equilibrium, friction, cables and center of gravity.
h. Engineering Dynamics: Velocity, acceleration and momentum; Newton's second law of motion, The moment law, work and energy.
i. Strength of Materials: Concepts of stress, strain and stress- strain diagram; Hook's law.
j. Thermodynamics: Properties of substances; first law of thermodynamics; Entropy and second
    a. law of thermodynamics; Thermodynamics cycles, gas compression and refrigeration and gas turbine engines – axial and centrifugal flow gas turbines.
k. Fluid Mechanics: Introductory concepts; Fluid in motion; Continuity equation; Mass conservation' Viscosity, Bernoulli's equation, Boundary layer; Laminar and turbulent flow.
l. Heat Transfer: Steady state and transition; heat conduction; Heat transfer by radiation; convective heat transfer, free and forced convection.
m. Engineering Drawing: Machine drawings; electrical and electronics diagram, Basic drawing concepts, different types of projections.

2. MECHANICAL (60 Marks)

2.1. Materials / Workshop Technology (15x2=30 Marks)

a. Workshop Technology: Bench tools and basic hand operations (Eg. Hacksaws, bench vices, hand drills, taps and dies, hand shears, rules, tapes and squares, soldering and brazing equipment, rivets types, scribing layout patterns, shearing and cutting sheet metal, riveting). Measuring and gaging.
b. Material properties: Tool materials, low/medium and high carbon steels, hot and cold rolled
    a. steels, alloy steels carbide and ceramic materials. Heat treatment methods for steels: hardening, tempering, annealing, normalizing, quenching. Aluminum alloys and its properties, heat treatment of Aluminum alloys. Other non ferrous materials such as brass, bronze.
c. Sheet metal work: Tools, marketing and layout, bending and rolling operations.
d. Engineering Mechanics: Velocity and acceleration, Newton's law of motion, Newton's law of gravitation, work done by force, kinetic energy of a particle. Principle of work and energy: appellation, power and efficiency potential energy, conservation, impulsive motion and impact.

e. Strength of Material: Concept of stress. Axial Loading, normal stress, shearing stress, bearing stress. Application to simple structures.

f. Stress and strain: Axial loading deformations; concept of strain. Normal strain under axial loading. Stress strain diagram, Hooks law, Modulus of elasticity. Elastic and plastic behavior. Deformation under axial load, Temperature effects. Poisson's Ratio. Shearing strain.

g. Torsion: Stress and deformations a uniform shaft, shear stresses and angle of twist: Elastic range.

h. Pure bending: Beam stresses in pure bending. Stresses and deformation in the elastic range.

2.2. Thermodynamics/ Heat Transfer/ Heat Engine (6x2=12 Marks)

a. Thermodynamics properties: Closed system, open system, working substance, pure substance: Properties and state. First law of thermodynamics/ Second law of thermodynamics. Properties of an ideal gas, liquids and vapors.

b. Refrigeration: Air Compressors. Refrigeration and air conditioning.

c. Heat Engines: gas turbines and its principles, theory.

d. Heat Transfer: Modes of heat transfer, conduction/ convective/ radiation heat transfer.

2.3. Instrumentation and measurement (5x2=10 Marks)

a. Measurement: Fundamentals of measurement. Sensors, transducers, resistance gages, thermistors and thermocouples, capacitate transducers, photoelectric transducers, piezoelectric transducers.

b. Measurement of force and torque, Pressure measurement, Measurement of fluid flow.

c. Temperature measurement, Motion measurement.

2.4. Machine construction (4x2=8 Marks)

a. Loading tensile: compressive, shearing, bending, bearing, torsion, common types of failure: failures related to loading types, Impact and plastic deformation effect, cyclic loading.

b. Ball and roller bearings: Construction and types, friction and lubrication of ball bearing, bearing material.

3. AERONAUTICAL (8x2=16 Marks)

a. Aircraft wing: Concept: basic structure, types of wing, flaps, slot, slat, aileron, spoiler aspect ratio, span.

b. Airfoil: Concepts: vortex generator, boundary layer, laminar and turbulent flow. Angle of incidence, lift, drag, lift/drag ratio, different types of airfoils.

c. Flight control surface: Concept: different types of flight control surfaces, axis of rotation.

d. Basic theory of flights: General basic concepts, stall buffeting, center of gravity, center of pressure, straight level flight, subsonic, transonic and supersonic flight.

e. Propulsion: General concepts of gas turbine engine, jet engine, turboprop engine and Bernoulli principal.

f. Gas Turbines: Compressors, turbines, Diffusers, compression, ration, combustion system compressor stall.

g. Atmosphere: General idea on different layers of atmosphere. Compressibility and incompressibility. Effects of temp, density and pressure on air viscosity.