

Nepal Airlines Corporation
Syllabus for Senior Technician (Grade - V)
Aircraft Maintenance Service (A & C)
Open Competition

Stages and Procedure of Examination System

First Stage: Written Examination - Full Marks 200

Weightage Allocation and Marks Distribution

S.No.	Paper	Subject	Time	Full Mark	Section	Marks
1	I	General Knowledge, Institutional Awareness and Office Management	3 Hrs.	100	Section "A" General Knowledge	MCQs 25x2=50
					Section "B" Institutional Awareness and Office Management	Short Questions 10x5=50
2	II	Service Related	45 Min.	100	Multiple Choice Questions	50x2=100

Second Stage - Interview

Individual Interview

Full Marks - 30

दृष्टव्य :

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

Paper I

Subject: General Knowledge, Institutional Awareness and Office Management

Full Marks: 100

Time: 3hrs.

खण्ड (क) सामान्य ज्ञान- (वस्तुगत बहुवैकल्पिक प्रश्न २५x२=५० अङ्क)

१. सामान्य ज्ञान

- १.१ विश्वको भूगोल - महादेश, महासागर, ध्रुव, अक्षांश, देशान्तर, समय, दुरी, पर्वतश्रृंखला, भुकम्प, ज्वालामुखी, नदी, हिमनदी, ताल, जलवायु
- १.२ नेपालको भूगोल - धरातलिय स्वरूप, किसिम, विशेषता, जलवायु, हावापानी, जनजीवन
- १.३ नेपालको प्राकृतिक स्रोत र साधनहरु सम्बन्धी जानकारी
- १.४ नेपालको ईतिहास - नेपालको ईतिहासका महत्वपूर्ण घटनाहरु
- १.५ नेपाली समाजका परम्परा, सामाजिक मूल्य र मान्यता, कला, संस्कृति, रितिरिवाज, धर्म, जातजाति र भाषा भाषी, जनसंख्या
- १.६ नेपालको राजनैतिक विभाजन, संघ प्रदेश र स्थानीय तह सम्बन्धी सामान्य जानकारी
- १.७ नेपालको संविधान (भाग १ र ३) तथा अनुसूची १ देखि ९ सम्म
- १.८ मानव जीवनमा प्रत्यक्ष प्रभाव पार्ने विज्ञानका प्रमुख आविष्कार
- १.९ राष्ट्रिय तथा अन्तर्राष्ट्रिय महत्वपूर्ण समसामयिक घटनाहरु
- १.१० विभिन्न आधारभूत वैज्ञानिक परिमाण र तिनको मापन (Measurement) CGS, MKS, FPS, SI System) सम्बन्धी ज्ञान
- १.११ दूरसञ्चार सेवा तथा सूचना प्रविधिसँग सम्बन्धित नवीनतम प्रविधि, उपकरण तथा आविष्कार

खण्ड (ख) - संस्थागत ज्ञान र कार्यालय व्यवस्थापन (विषयगत १० प्रश्न X ५=५० अङ्क)

२. संस्थागत ज्ञान (३० अङ्क)

- २.१ नेपालमा हवाई यातायातको विकासक्रम, नेपाल वायुसेवा निगमको परिचय, उद्देश्य र कार्यक्षेत्र
- २.२ नेपाल वायुसेवा निगमको कर्मचारीहरुको सेवा, शर्त सम्बन्धी विनियमावलीको विदा, आचरण तथा अनुशासन तथा विभागीय कारबाही सम्बन्धी सामान्य जानकारी
- २.३ भ्रष्टाचार निवारण ऐन, २०५९ को भ्रष्टाचार कसूर र सजाय सम्बन्धी परिच्छेद
- २.४ संस्कृति, पर्यटन तथा नागरिक उड्डयन मन्त्रालयको काम, कर्तव्य र अधिकार
- २.५ नेपाल नागरिक उड्डयन प्राधिकरणको काम, कर्तव्य र अधिकार

३. कार्यालय व्यवस्थापन सम्बन्धी (२० अङ्क)

- ३.१ कार्यालय व्यवस्थापनको अवधारणा र यसका पक्षहरु
- ३.२ कार्यालयमा प्रयोग हुने अत्यावश्यक सामग्रीहरु र तिनको प्रयोग

- ३.३ दर्ता, चलानी, फाइलिङ्ग, टिप्पणी र पत्र व्यवहार सम्बन्धी जानकारी
- ३.४ प्रतिवेदनका प्रकार र प्रतिवेदन लेखन
- ३.५ कार्यालयमा प्राप्त हुने गुनासाहरु र सोको सुनुवाइ
- ३.६ बजारीकरणका विधि र प्रविधिहरु (Marketing Tools & Techniques, Sales Promotion Strategy, Customer Attraction, Satisfaction and Retention)
- ३.७ सार्वजनिक सम्बन्ध र सञ्चार सीप (Public Relation and Communication Skills)
- ३.८ जिन्सी व्यवस्थापन (Inventory Management)
- ३.९ कार्यक्षेत्रमा समूह कार्य (Group/Team Work) र सकारात्मक धारणा (Positive Attitude)

Paper II

Service Related

Full Mark: 100 (Multiple Choice Questions 50x2)

Time: 45 minutes

Subject-Service Related

Part 1 - Fundamentals (15x2=30 Marks)

- 1.1. **Arithmetic:** Fractions, decimals, percentages, ratio, proportion, variation, power, roots and logarithms.
- 1.2. **Algebra:** Addition, subtraction, multiplication and division of like unlike terms, simple equations, transpositions of formulae
- 1.3. **Geometry and Mensuration:** Lines, angles, regular plane figures, regular solids. Areas of plane figures and surfaces of regular solids. Volumes of cubes, prisms and cylinders
- 1.4. **Trigonometry:** Sine, cosine and tangent ratios, Solution of right-angled triangles using trigonometrical ratios.
- 1.5. **Graphs:** Construction and interpretation of graphs of linear, simple exponential, sine and cosine functions.
- 1.6. **Vectors:** Vector and scalar quantities, summation and resolution of vector quantities.
- 1.7. **Mechanics:** U.S. British and metric systems of measurement the S.I. System and methods of conversion: measurement tolerances, mass, weight, moments, centre of gravity. Dynamics: force, speed, velocity, angular velocity, acceleration, inertia, momentum, torque, work, energy and power, Newton's Laws of Motion.
- 1.8. **Fluid-mechanics:** Pressure, density, specific gravity, Pascal's principle, Archimedes' principle Properties of fluids, Bernoulli's Theorem, Venturi meter, steady and unsteady flow, potential and kinetic energy effects in fluid flow.
- 1.9. **Heat and Thermodynamics:** Thermometers and temperature scales Celsius, Fahrenheit, Rankin and Kelvin. Conversion between scales, Quantity of heat: units of heat (calories, B.T.U., C.H.U.), heat capacity, specific heat. Heat transfer convection, radiation and conduction, expansion of solids and liquids: coefficient of linear expansion of solids, bi-metallic strips, elementary thermodynamics, first and second laws, mechanical equivalent of heat, humidity, absolute and relative, vapor pressure, Gases; Charles' and Boyle's Laws, internal energy of a gas, specific heat of gas, relationship between internal energy and heat.
- 1.10. **Electricity and Magnetism** Fundamentals, atoms and electrons, conductors and insulators electric currents, electromotive forces, difference of potential; electrical units; power; work and energy Ohm's Law, specific resistance series, parallel and combined DC circuits Kirchhoff's Laws, the Wheatstone bridge, Electromagnetic Induction: Faraday's Laws, Lenz's magnitude and direction of induced EMF, generators, inducting coils, Inductance and capacitance: mutual inductance, self inductance, unit of capacitance, specific inductive capacity, condensers, dielectric strength, losses and efficiency, Simple A.C. principles

generation, measurement of A.C. current, voltage and frequency simple transformers and rectifiers.

1.11. Basic Computer knowledge

Part 2 - Workshop Practice (6x2=12 Marks)

- 2.1. Workshop Standards:** Workshop safety, care of tools, dimensions, workmanship.
- 2.2. Basic Tools:** Hand tools for driving, cutting and shaping, Spanners and wrenches torque wrenches. Grinding and broaching.
- 2.3. Measurement:** Rules, dividers, caliper, micrometers, vernier gauges, dial gauges, thread gauges, marking out.
- 2.4. Technical Drawing:** Orthographic projection first angle and third angle, isometric and oblique projection. Dimensioning standard symbols, Representation of machine unit.
- 2.5. Wires and Cables:** Standard wire gauges: U.S., U.K. and metric, wire ropes: types, splicing, swaging, and fittings. Turn-buckles and tensioning devices: locking and safety.

Part - 3 Material Science (7x2=14 Marks)

- 3.1. Metals and Alloys:** Pure metals, metallic alloys, carbon additions to iron, cast and wrought forms of steel.
- 3.2. Mechanical Properties of Metals:** Elasticity, hardness, ductility, behavior under stress and strain, tensile test, hardness, fatigue.
- 3.3. Steel:** Type of steel, classification of steels, heat treatment, surface hardening.
- 3.4. Aluminum Alloys:** Properties of aluminum and its alloys, heat treat corrosion protection.
- 3.5. Non-ferrous Alloys:** Utilization and properties of magnesium alloys, nickel alloys, brasses, bronzes, titanium alloys.
- 3.6. Joining of Metals:** Welding-gas arc and resistance brazing and silver soldering, adhesive bonding.
- 3.7. Non-Destructive Testing:** Types of defects, Penetrate dye and electromagnetic methods, elementary principles of ultrasonic, eddy-current methods.
- 3.8. Corrosion Protection:** Causes and types of corrosion, protection of metals by anodizing, plating, coating and painting.
- 4.9. Non-metallic Materials:** Properties and utilization of wood, glue, fabric, dope, paint, rubber, plastics, glass, fiberglass and textiles on aircraft, structural composite materials.

Part 4-General Knowledge of Aircraft (6x2=12 Marks)

- 4.1. **Flight:** Theory of flight, fixed wings and rotary-wings: advantages and disadvantages.
- 4.2. **Fixed-wing flight:** Gliders and aeroplanes, biplanes and monoplanes, single-engines and multi engine aircraft. Aircraft shapes for particular purposes
- 4.3. **Rotary-wing Flight:** Autogiro and helicopters, general principles of rotorcraft
- 4.4. **Propulsion:** Types of engine: Basic principles of piston and turbo engines elementary principles of pulsejets ramjets and rockets.
- 4.5. **Air-conditioning Systems:** Heating and ventilating systems, Air-sources: types of compressors and blowers, air bleeds, Silencers and coolers, Flow and pressure controls; flow control valves, pressure controllers, outflow valves, sensing and control devices, Temperature and humidity control: heat sources-compression, combustion heaters. Cooling systems: heat exchangers air-cycle coolers, vapor cycle coolers.

Part 5-Piston Engines Theory (7x2=14 Marks)

- 5.1. **Piston Engine Theory:** Four stroke cycle-bore, stroke, compression ratio, mean effective pressure, engine efficiency, and mechanical volumetric and total, Determination of horsepower, performance.
- 5.2. **Configuration and Construction:** Inline, horizontally-opposed and radial engines, number of cylinders, cooling methods, construction.
- 5.3. **Lubrication:** Oil specifications, oil supply system, Engine oil system, pressure regulation, filter and chip detectors.
- 5.4. **Fuels and Fuel System:** Fuel specifications: octane and performance numbers, additives, tank and fuel system layouts: types of tanks, venting tank pumps, quantity and flow indicating Refueling defuelling: over-wing and under-wing system, filtration, fire explosion precautions. Protection from ice vapor locking and micro-biological contamination.
- 5.5. **Carburetion and supercharging:** float-types, carburetors: principles, construction control devices. Fuel injection system; principles, types, construction, control devices
- 5.6. **Ignition:** Magneto systems: polar indicator and rotating armature type, low tension ignition systems, installing and timing magnetos, spark plugs: types, construction, cleaning, testing.
- 5.7. **Engine Accessories:** Gear-boxes, pumps, generators, etc. Engine starting system, Engine instrumentation: tachometers, pressure and temperature indicators.

Part 6-Gas Turbine Engines (9x2=18 Marks)

- 6.1. **Turbine Engine Theory:** Constant pressure cycle: effect of altitude, temperature and forward speed on performance, engine efficiency-thermal propulsive and overall performance.

- 6.2. **Compressors:** Principles: impulse and reacting blading, blade shrouds, turbine efficiency, construction, materials, balance, surging and stalling, Intakes and castings: pressure recovery, bleeds, anti-icing.
- 6.3. **Turbines:** Principles: impulse and reaction blading, blade shrouds, turbine efficiency, Construction: materials creep, cooling of discs and blades, bearings and balance.
- 6.4. **Fuels and Fuel System:** Fuel specifications: kerosene, wide cut, additives, tank and fuel system layouts: types of tanks, venting tank pumps, quantity and flow indication, fire explosion precautions, Protection from ice. Vapor locking and micro-biological contamination.
- 6.5. **Combustion:** Principles of continuous combustion, pipe, cannular and annular combustion chambers, combustion efficiency, type of fuel nozzles.
- 6.6. **Engine Accessories:** Gear-boxes, pumps, generators, etc. Engine starting system, Engine instrumentation: tachometers, pressure and temperature indicators.