

नेपाल सरकार  
गृह मन्त्रालय  
नेपाल प्रहरी प्रधान कार्यालय  
(मानवश्रोत विकास विभाग, भर्ना छनौट शाखा)  
नक्साल, काठमाण्डौ ।

प्राविधिक प्रहरी निरीक्षक (ईलेक्ट्रिकल इन्जिनियर) पदको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

सेवा: नेपाल प्रहरी

उपसमूह: इन्जिनियरिङ, भौतिक पूर्वाधार तर्फ

समूह: प्राविधिक प्रहरी

श्रेणी: राजपत्राङ्कित तृतीय

**परीक्षा योजना (Examination Scheme)**

क्र.सं.	परीक्षा चरण	विवरण	पूर्णाङ्क
१.	प्रथम चरण	प्रारम्भिक तथा विस्तृत स्वास्थ्य परीक्षण	-
२.	द्वितीय चरण	लिखित परीक्षा	२००
३.	तृतीय चरण	विशेष स्वास्थ्य परीक्षण	-
४.	चतुर्थ चरण	अन्तरवार्ता	३०

**प्रथम चरण:-** प्रारम्भिक तथा विस्तृत स्वास्थ्य परीक्षण

- प्रहरी सेवाको पदमा नियुक्ति र बढुवा गर्दा अपनाउनु पर्ने सामान्य सिद्धान्त, २०६९ को अनुसूची-६ र ८ बमोजिम हुने ।

**द्वितीय चरण:-** लिखित परीक्षा योजना (Written Examination Scheme)

पत्र	विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	प्रश्न संख्या अङ्कभार	समय
प्रथम (Paper I)	Professional and Service Specific Test (PSST)	१००	४०	वस्तुगत बहुवैकल्पिक प्रश्न (Multiple Choice)	१०० प्रश्न×१ अंक = १००	१ घण्टा १५ मिनेट
द्वितीय (Paper II)		१००	४०	विषयगत (Subjective)	<u>छोटो उत्तर</u> ४ प्रश्न×५ अंक = २० <u>लामो उत्तर</u> ८ प्रश्न ×१० अंक = ८०	३ घण्टा

**तृतीय चरण:-** विशेष स्वास्थ्य परीक्षण

- प्रहरी सेवाको पदमा नियुक्ति र बढुवा गर्दा अपनाउनु पर्ने सामान्य सिद्धान्त, २०६९ को अनुसूची-९ बमोजिम हुने ।

**चतुर्थ चरण:- अन्तरवार्ता (Interview)**

विषय	पूर्णाङ्क	परीक्षा प्रणाली
अन्तरवार्ता	३०	मौखिक

**द्रष्टव्य:**

१. यो पाठ्यक्रमको योजना अनुसार दुई पत्रको लिखित परीक्षा हुनेछ ।
२. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।
३. पाठ्यक्रमको प्रथम र द्वितीय पत्रको विषयवस्तु एउटै हुनेछ ।
४. प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
५. लिखित परीक्षाको प्रथम तथा द्वितीय पत्रको पाठ्यक्रमका इकाइहरूको प्रश्नहरूको संख्या निम्नानुसार हुनेछ ।

लिखित परीक्षाका खण्ड	खण्ड-क (A)										खण्ड-ख (B)										खण्ड-ग(C)	
प्रथम पत्रका इकाइ	1	2	3	4	5	6	7	8	9	10	-										1	
प्रथम पत्रका प्रश्न संख्या	9	9	9	9	9	9	9	9	9	9	-										10	
द्वितीय पत्रका खण्ड	खण्ड-क (A)										खण्ड-ख (B)										खण्ड-ग (C)	
द्वितीय पत्रका इकाइ	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	
द्वितीय पत्रका प्रश्न संख्या	छोटो	-										2										2
	लामो	-										8										-

६. यस पाठ्यक्रममा जे सुकै कुरा लेखिएको भए तापनि पाठ्यक्रममा परेका ऐन नियमहरू तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा रहेको सम्झनु पर्छ ।
७. वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरूको उत्तर सही दिएमा प्रत्येक सही उत्तर बापत २ (दुई) अंक दिईने छ भने गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २०% अंक कट्टा गरिने छ । तर उत्तर नदिएमा त्यस बापत अंक दिईने छैन र अंक कट्टा पनि गरिने छैन ।
८. द्वितीय पत्रको विषयगत प्रश्नका लागि तोकिएका १० अङ्कका प्रश्नहरूको हकमा १० अङ्कको एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरू (Short notes) सोध्न सकिनेछ ।
९. द्वितीय पत्रको पाठ्यक्रमलाई ३ वटा खण्डमा विभाजन गरिएको छ । ३ वटा खण्डको लागि ३ वटै उत्तर पुस्तिका दिईनेछ र परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरूको उत्तर सोही खण्डको उत्तर पुस्तिकामा लेख्नुपर्नेछ ।

**पाठ्यक्रम लागू मिति:- २०८२/१२/०९ गते ।**

## लिखित परीक्षा (Written Examination)

### **प्रथम र द्वितीय पत्र :- Professional and Service Specific Test (PSST)**

#### **खण्ड “क” (Section-A)**

#### **1. DC CIRCUIT ANALYSIS**

- 1.1 Circuit elements: Resistor, Inductor and Capacitor
- 1.2 Dependent and independent current source and voltage source
- 1.3 Ohms law, Kirchoff's law, nodal and mesh analysis
- 1.4 Series and parallel circuit, delta-star and star-delta transformation
- 1.5 Network Theorem: Thevenin's theorem, Nortons theorem, Superposition theorem, Reciprocity theorem and Maximum power transfer theorem.
- 1.6 Transient response of RLC circuit excited by DC source

#### **2. AC CIRCUIT ANALYSIS**

- 2.1 Alternating voltage and current, average and RMS value.
- 2.2 RLC series and parallel circuits, Phasor algebra
- 2.3 Concept of complex Impedance and Admittance
- 2.4 Resonance in series and parallel RLC circuit, bandwidth and effect of Q-factor
- 2.5 Active, Reactive and Apparent power
- 2.6 Transient response of RLC circuit excited by AC source
- 2.7 Fourier series and Fourier Transform
- 2.8 Two-port network: Z, Y, T and h parameters, T to II and II to T transformation, two-port network connection
- 2.9 Generation of three-phase voltages, star and delta connections, current and voltage relation in star and delta connections, three phase power measurement

#### **3. ELECTRICAL MACHINES**

- 3.1 Transformer: Constructional detail, Operating principle, Equivalent Circuit, Losses and efficiency, Voltage regulation, Exciting current harmonics, Transformer inrush current, Transformer tests, Auto transformer, Three phase transformer connections, Parallel operation.
- 3.2 DC Machine: Constructional detail, Operating principle of dc generator, Voltage build-up process, Types of dc generator, their characteristics and applications, Losses and efficiency, Armature reaction and commutation, Operating principle of dc motor, Back emf, Types of dc motor, their characteristics and applications, DC motors starter, Speed control of dc motor
- 3.3 Induction machine: Constructional detail, Operating principle of three phase induction motor, Equivalent circuit, Torque-speed characteristic, Losses and efficiency, Starting methods, Speed control of three phase induction motor, Induction motor tests, Induction generator, Single phase induction motors- types, characteristics and applications.
- 3.4 Synchronous machine: Constructional detail, Operating principle of synchronous generator, Armature reaction, Equivalent circuit, phasor diagram and power angle characteristics of cylindrical rotor machine and salient pole machine, Parallel operation of synchronous generators, Operating principle of synchronous motor, Starting methods, Effect of excitation on performance of synchronous motor, V and Inverted V curves.

#### **4. INSTRUMENTATION**

- 4.1 Transducers: Measurement of electrical, mechanical, thermal and hydraulic variables
- 4.2 Moving Coil and Moving Iron Instruments: Galvanometer, Ammeter, Voltmeter, Wattmeter, Watt-hour meter, Maximum Demand Meter, Frequency Meter and Power Factor Meter
- 4.3 Accuracy and Precision: Parallax, Absolute and Relative Errors
- 4.4 Measurement of low, medium, high resistances and Megger
- 4.5 DC and AC bridge circuits
- 4.6 Operational Amplifier and filters: Ideal Op-Am, Feedback Op-Am, Adder, Signal Amplification, attenuation, differentiation and integration
- 4.7 Oscilloscope: Operating principles, Analog and Digital Oscilloscope
- 4.8 Analog to Digital and Digital to Analog converters: Weighted resistor type and Ladder type D/A converters, Dual-ramp type and Successive approximation type A/D converters
- 4.9 Digital instrumentation: Fundamental principles, interfacing to the computers, Microprocessor based instrumentation
- 4.10 Instrument Transformers: Construction and Operating Principles of Measuring and Protection type CTs, Potential transformers

#### **5. GENERATION, TRANSMISSION AND DISTRIBUTION**

- 5.1 Hydroelectric Power Plants: Hydraulic to electrical energy conversion, output power equation, classification, elements of hydroelectric power plant and schematic layouts, site selection, classification of water turbines, working principle of different types of water turbines, physical characteristics and efficiencies, governing of water turbines, selection of water turbines, essential features of hydroelectric alternators, auxiliaries in hydroelectric plant, advantages and disadvantages of hydroelectric plants.
- 5.2 Steam power Plants: Elements of a steam power plant and their schematic arrangement; working principle, vibration monitoring, governing, cooling efficiency, alternators used for steam turbine driven units
- 5.3 Diesel Power Plants: Elements of a diesel power plant, schematic arrangement; working principle, efficiency, cooling, governing, speed control, application, performance and thermal efficiency, alternators used for diesel units, advantages and disadvantages of diesel plants.
- 5.4 Non-Conventional method of power generation: Concept of solar photovoltaic, wind and geothermal method of power generation and their importance
- 5.5 Power transmission system: Overhead and underground transmissions, advantages and limitations of high voltage transmission; choice of working voltage, conductor size and configuration, supports and cross arms, insulators used in overhead lines, vibration dampers sag tension calculation.
- 5.6 Power Distribution System: Voltage levels, primary and secondary distribution, radial and ring mains distribution, single phase and three phase ac distribution, pole/tower types, conductors and insulators used in distribution lines, distribution transformer and its accessories, protection coordination in distribution system.

#### **6. POWER SYSTEM ANALYSIS**

- 6.1 Transmission line parameters: Computation of series and shunt parameters of transmission line equivalent circuits, concept of GMD and GMR, proximity effect and skin effect.
- 6.2 Per unit system representation: Single line impedance and reactance diagrams
- 6.3 Transmission line performance: Lumped and distributed parameter modeling, ABCD parameters, efficiency & regulations calculations, Ferranti effect, surge impedance loading

- 6.4 Load flow: Y-bus of a power system network, Gauss-Seidal and Newton-Rapshon methods
- 6.5 Over voltages in transmission lines: Power frequency, switching and lightning over voltages, surge arrestors
- 6.6 VAR compensation: Real and reactive power flow through transmission line, series and shunt compensations
- 6.7 Fault calculations: Symmetrical components, grounded & ungrounded systems, L-G, L-L, L-L-G and 3-phase faults.
- 6.8 Stability studies: Steady state & transient stability limits, swing equations, equal area criterion, stability enhancement techniques.
- 6.9 Corona: corona inception voltage, power loss, waveform deformation, RI and AN due to corona

## **7. SWITCHGEAR AND PROTECTION**

- 7.1 Fuse: Types, characteristics and operating principles
- 7.2 Magnetic Contactors: Types, construction, operating principles
- 7.3 Isolators (Disconnecting switches): types, construction and operating principles
- 7.4 MCB and MCCB: Construction, operating principles, characteristics
- 7.5 Relays: Electromagnetic and Static Relays, Over current Relay, Impedance Relay, Directional Relay
- 7.6 Circuit Breakers: ACB, OCB, ABCB, VCB and SF6 CB; construction, operating principles and applications
- 7.7 Protection schemes: Over current, under voltage, differential, distance protection
- 7.8 Grounding: System and equipment grounding, electric shock, safe value of current and voltages, touch and step potentials, Ground Fault Current Interrupters

## **8. AUTOMATIC CONTROL SYSTEM**

- 8.1 Mathematical modeling: differential equation representation, transfer function notations and state space representations of a physical system.
- 8.2 Block diagram: block diagram representation of the control system components, signal flow graphs.
- 8.3 Time response: impulse response, step and ramp response analysis of a 1st and 2nd order systems, overshoot and damping concepts.
- 8.4 Steady state error: evaluation of the steady state error and error constants
- 8.5 Stability: Relative and absolute stability, Routh-Herwitz criterion.
- 8.6 Controllers: lead-lag and PID controllers.
- 8.7 Root locus: judging the relative stability and setting controller parameters of a close loop control system using root locus technique.
- 8.8 Frequency response: Polar and Bode plots, stability in frequency domain, gain margin and phase margins, controller parameters selection using frequency response.

## **9. BASIC ELECTRONICS**

- 9.1 Bi-polar junction transistor: construction, operating characteristics, use as amplifier and switch.
- 9.2 Logic circuit: Decimal, Binary and Hexadecimal system, logic gates, adder, Encoder, Decoder, Multiplexer, Demultiplexer.
- 9.3 Power Electronics Devices: Thyristor, Triac, MOSFET, UJT, GTO – Construction and their characteristics
- 9.4 Rectifier: Rectifier using diodes - half wave, full wave, single phase, three phase, capacitor and inductor filters, Controlled rectifier using thyristors - half wave, full wave, single phase, three phase.

- 9.5 DC chopper: Step down chopper, Step up chopper.
- 9.6 Inverter: Single phase voltage inverter, Three phase voltage inverter, current source inverter.
- 9.7 Cyclo-converter – Single phase and three phase.
- 9.8 AC voltage controller – with resistive load and inductive load.

## **10. UTILIZATION OF ELECTRICAL ENERGY**

- 10.1 Economic considerations: Cost classification; interest and depreciation
- 10.2 Load characteristics: load curves, load duration curve, demand factor; load factor, diversity factor, causes of low power factor and its disadvantages, power factor improvement and its economics
- 10.3 Plant use factor; load sharing between base load and peak load plants
- 10.4 Tariff: objective, factors affecting tariff, types of tariff
- 10.5 Illumination: Illumination and luminance, radiant efficiency, plane and solid angles, laws of illumination; polar curves, illumination requirement, design of indoor and out-door lighting scheme.
- 10.6 Lamps: Incandescent lamps, arc lamps, sodium discharge lamps, mercury fluorescent lamps, high pressure mercury vapor lamps
- 10.7 Electrical energy conservation and analysis.

## **खण्ड “ख” (Section-B)**

### **1. HYDRO POWER POLICY AND PLANNING**

- 1.1 History of power development in Nepal; hydro power potential; energy supply demand trends; challenges and prospects of hydropower development; role of government institutions; NEA and private sectors in power development; concept of deregulation and unbundling; Concept of independent regulatory commission; efforts towards power sector reform.
- 1.2 Salient features of various Nepalese power plants; current scenario of transmission and distribution networks and substations in Nepal.
- 1.3 Legal provisions:
  - 1.3.1 Electricity Act
  - 1.3.2 Electricity Regulation
  - 1.3.3 NEA Act
  - 1.3.4 Civil Service Act
  - 1.3.5 Civil Service Regulation
  - 1.3.6 Hydropower Development Policy

### **2. ECONOMICS OF POWER UTILIZATION**

- 2.1 Economic considerations: Cost classification; interest and depreciation
- 2.2 Demand characteristics: load curves, load duration curve, demand factor; load factor, diversity factor, causes of low power factor and its disadvantages, power factor improvement and its economics
- 2.3 Tariff: objective, factors affecting tariff, types of tariff
- 2.4 Illumination: Illumination and luminance, radiant efficiency, plane and solid angles, laws of illumination; polar curves, illumination requirement, design of indoor and out-door lighting scheme.

Incandescent lamps, arc lamps, sodium discharge lamps, mercury fluorescent lamps, high pressure mercury vapor lamps.

### **3. NETWORK ANALYSIS**

- 3.1 Ohms law, Kirchoff's law, nodal and mesh analysis
- 3.2 Series and parallel circuit, delta-star and star-delta transformation
- 3.3 Concept of complex Impedance and Admittance RLC series and parallel circuit
- 3.4 Network Theorem: Thevenin's theorem, Nortons theorem, Superposition theorem, Reciprocity theorem and Maximum power transfer theorem.
- 3.5 Resonance in series and parallel RLC circuit
- 3.6 Active, Reactive and Apparent power
- 3.7 Transient response of RLC circuit excited by DC and AC sources
- 3.8 Fourier analysis
- 3.9 Two-port network: Z, Y, T and h parameters, T to II and II to T transformation, two-port network connection
- 3.10 Three-phase circuit analysis, phase and line quantities

### **4. CONTROL SYSTEM**

- 4.1 Mathematical modeling: differential equation representation, transfer function notations and state space representations of physical systems, Block diagram algebra, signal flow graphs.
- 4.2 Transient and steady state response: impulse response, step and ramp response analysis of a 1st and 2nd order systems, overshoot and damping, steady state error and error constants
- 4.3 Effect of feedback on stability and steady state error
- 4.4 Stability: Relative and absolute stability, Routh -Herwitz criterion.
- 4.5 Root locus: Manual plotting and judging the relative stability using root locus technique.
- 4.6 Frequency response: Polar, and Bode plots, stability in frequency domain, gain margin and phase margins, Nyquist criterion for stability.
- 4.7 Root locus: Manual plotting and judging the relative stability using root locus technique.
- 4.8 Control system design: lead-lag and PID controllers and setting the controller parameters using Root locus and Bode plots.

### **5. STATIC AND DYNAMIC ELECTRICAL MACHINES**

- 5.1 Transformer: Working principle, Equivalent Circuit, Losses and efficiency, Voltage regulation, Transformer tests, Auto transformer, Three phase transformer connections, Parallel operation
- 5.2 DC Machine: Constructional detail, Operation in motoring and generating mode, Back emf in DC motor, Types of DC motor, their characteristics and applications, DC motor starter, Speed control of DC motor
- 5.3 Induction machine: Equivalent circuit, Torque-speed characteristic, Losses and efficiency, Starting

methods, Speed control of three phase induction motor, Induction motor tests, Single phase induction motors- types, characteristics and applications

- 5.4 Synchronous machine: Salient pole and cylindrical rotor construction, generating and motoring principle, phasor diagram and power angle characteristics, Parallel operation of synchronous generators, Starting methods for synchronous motor, Effect of excitation, V and Inverted V curves, Synchronous condenser

## **6. ELECTRICAL SUPPLY SYSTEMS**

- 6.1 Power Plants: components of hydro power plant, Steam power Plants and Diesel Power Plants; Turbine classifications, governing systems, Plant use factor; load sharing between base load and peak load plants
- 6.2 Transmission system: Overhead and underground transmissions, EHV AC and HVDC Transmission.
- 6.3 Electrical and Mechanical design of Overhead AC transmission: Selections of conductor size and configuration, supports and cross arms, insulators, sag and tension calculation.
- 6.4 Power Distribution System: primary and secondary distribution, Distribution network layouts, protection coordination in distribution system.

## **7. POWER SYSTEM ANALYSIS**

- 7.1 Computation of transmission line parameters, GMD and GMR, proximity effect and skin effect.
- 7.2 Transmission line performance: Per unit system representation, Single line diagram, Lumped and distributed parameter modeling, ABCD parameters, efficiency & regulations calculations, Ferranti effect, surge impedance loading
- 7.3 Load flow: Basic Load flow equation, Gauss-Seidal and Newton-Raphson methods
- 7.4 Over voltages in transmission lines: Power frequency, switching and lightning over voltages, surge arrestors
- 7.5 VAR compensation: Real and reactive power flow through transmission line, series and shunt compensations
- 7.6 Fault calculations: Symmetrical and unsymmetrical faults
- 7.7 Power system stability studies: Steady state & transient stability limits, swing equations, equal area criterion, stability enhancement techniques.
- 7.8 Corona: corona inception voltage, power loss, waveform deformation, RI and AN due to corona

## **8. MEASUREMENTS AND INSTRUMENTATION**

- 8.1 Accuracy, Precision, Absolute and Relative Errors, Parallax
- 8.2 Deflection type measuring instruments: Galvanometer, Ammeter, Voltmeter, Wattmeter, Watt-hour meter, Maximum Demand Meter, Frequency Meter
- 8.3 Instrument Transformers: Operating Principles of Measuring and Protection type CTs, Potential

transformers

- 8.4 Transducers: Tachometer, potentiometer, Measurement of electrical, mechanical, thermal and hydraulic variables
- 8.5 Measurement of low medium and high resistances by Ohmmeter method, Meggers and DC bridges
- 8.6 Measurement of inductance, capacitance and frequency by AC bridge circuits
- 8.7 Operational Amplifier: Signal Amplification, attenuation, differentiation, integration and adder
- 8.8 Operating principles of Analog and Digital Oscilloscope
- 8.9 Analog to Digital and Digital to Analog converters
- 8.10 Digital instrumentation: Fundamental principles, interfacing to the computers, Microprocessor based instrumentation

## **9. POWER SYSTEM PROTECTION**

- 9.1 Fuse, Magnetic Contactors, Isolators, MCB and MCCB: characteristics and operating principles
- 9.2 Relays: Electromagnetic and Static Relays, Over current Relay, Impedance Relay, Directional Relay
- 9.3 Circuit Breakers: ACB, OCB, ABCB, VCB and SF6 CB; construction, operating principles and applications
- 9.4 Protection schemes: Over current, under voltage, differential, distance protection
- 9.5 Grounding: System and equipment grounding, electric shock, safe value of current and voltages, touch and step potentials, Ground Fault Current Interrupters

## **10. POWER ELECTRONICS**

- 10.1 Devices: Power Transistor, Power Diodes, Thyristor, Triac, MOSFET, UJT, GTO – Construction and their characteristics
- 10.2 Rectifier: Rectifier using diodes - half wave, full wave, single phase, three phase, capacitor and inductor filters, Controlled rectifier using thyristors - half wave, full wave, single phase, three phase.
- 10.3 DC chopper: Step down chopper, Step up chopper.
- 10.4 Inverter: Single phase voltage inverter, Three phase voltage inverter, current source inverter.
- 10.5 Cyclo-converter – Single phase and three phase.
- 10.6 AC voltage controller – with resistive load and inductive load.

## खण्ड “ग” (Section-C)

### १. सामान्य ज्ञान तथा नेपाल प्रहरी सेवा सम्बन्धी

- क. नेपालको भूगोल सम्बन्धी सामान्य जानकारी (भौगोलिक अवस्था, स्वरूप, किसिम र विशेषताहरू, हावापानी किसिम र विशेषता, जल सम्पदा: स्थिति र महत्व, वन सम्पदा: अवस्था र महत्व, संरक्षण क्षेत्रहरू तथा वन विनाशका कारण र संरक्षणका उपायहरू, नेपालका प्रमुख हिमशिखरहरू, तालतलैया, झरना, भञ्ज्याङ)
- ख. इतिहास र संस्कृति सम्बन्धी सामान्य जानकारी (आधुनिक नेपालको इतिहास (पृथ्वीनारायण शाह देखि हालसम्म), नेपालको सांस्कृतिक, धार्मिक एवं मौलिक परम्परा, जातजाति, भाषाभाषी, कला र साहित्य सम्बन्धी सामान्य जानकारी ।
- ग. नेपालको वर्तमान संविधान २०७२ का मुख्य-मुख्य व्यवस्थाहरू
- घ. जनसंख्या र वातावरण सम्बन्धी सामान्य जानकारी (जनसंख्या, शहरीकरण, बसोवास (बँसाईसराई), जैविक विविधता, जलवायु परिवर्तन, वातावरण तथा प्रदूषण)
- ङ. समसामयिक घटना तथा नविनतम् विषयवस्तुहरू: (राष्ट्रिय तथा अन्तराष्ट्रिय महत्वका राजनैतिक, सामाजिक, आर्थिक, वैज्ञानिक, सांस्कृतिक, खेलकूद, पुरस्कार, कला साहित्य, संगित सम्बन्धी)
- च. नेपाल प्रहरीको पृष्ठभूमि (वि.स. २००७ साल देखि हालसम्म) र वर्तमान अवस्था
- छ. प्रहरी ऐन, २०१२ र प्रहरी नियमावली, २०७१ (संशोधन सहित) का मुख्य-मुख्य व्यवस्थाहरू (संगठनात्मक स्वरूप, सेवाको प्रकार, दर्ज्यानी चिन्ह, पद तथा श्रेणी सेवा, शर्त र सुविधा, प्रहरी आचरण, नियुक्ति र अवकाश, प्रहरी कर्मचारीको काम-कर्तव्य अधिकार, नेपाल प्रहरीमा प्राविधिक प्रहरी कर्मचारीको महत्व र आवश्यकता, नेपाल प्रहरी कार्यालयको स्थापना र कार्यालय प्रमुख सम्बन्धी व्यवस्था)
- ज. विविध:- सुरक्षा समिति (केन्द्र, प्रदेश र जिल्ला), नेपाल प्रहरी र अन्य सुरक्षा निकायहरू (नेपाली सेना, सशत्रु प्रहरी बल नेपाल र राष्ट्रिय अनुसन्धान विभाग) संगको सम्बन्ध, अपराध परिचय, महत्व र प्रविधिको प्रयोग, विपद व्यवस्थापनमा नेपाल प्रहरी, सार्क, संयुक्त राष्ट्रसंघ, इन्टरपोल सम्बन्धी जानकारी ।

## लिखित परीक्षाको नमूना प्रश्नपत्र

### वस्तुगत बहुवैकल्पिक प्रश्न (Multiple Choice Question)

1. The emf equation of a transformer is:

- A.  $E = 4.44fN\phi_m$
- B.  $E = 2.22fN\phi_m$
- C.  $E = 1.11fN\phi_m$
- D.  $E = 0.44fN\phi_m$

2. The main advantage of diesel power plants is:

- A. Low initial cost
- B. High efficiency at small loads
- C. Quick starting
- D. All of the above

3. Mesh analysis is mainly based on:

- A. KCL
- B. KVL
- C. Ohm's law
- D. Faraday's law

4. In star connection:

- A. Line voltage = Phase voltage
- B. Line voltage =  $\sqrt{3} \times$  Phase voltage
- C. Phase voltage =  $\sqrt{3} \times$  Line voltage
- D. Line current =  $\sqrt{3} \times$  Phase current

### छोटो प्रश्न (Short Question)

1. Write factors affecting transient stability.
2. Explain different types of protection used in power system.

### लामो प्रश्न (Long Question)

1. What types of Bus-bar arrangements are used in a sub-station? Describe briefly the types of bus-bar arrangement with line diagram.
2. State the condition for proper operation of two transformers in parallel, giving reasons for impositions of each of these conditions.

-समाप्त-