नेपाल विद्युत प्राधिकरण

प्राविधिक सेवा, मेकानिकल समूह, तह-५, सुपरभाइजर पदको
खुल्ला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

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

पत्र	विषय	पूर्णांङ्क	उत्तिर्णाङ्क	परीक्षा प्रणाली		प्रश्न संख्या	प्रति प्रश्न अंकभार	समय
प्रथम	आधारभूत सामान्य ज्ञान र सेवा सम्बन्धी	१००	४०	वस्तुगत वहु बैकल्पिक प्रश्न	खण्ड (क) आधारभूत सामान्य ज्ञान	२०	२	४५ मिनेट
					खण्ड (ख) सेवा सम्बन्धी	३०	२	
द्वितीय	सेवा सम्बन्धी	१००	४०	विषयगत प्रश्न	छोटो उत्तर आउने प्रश्न	१०	५	२ घण्टा ३० मिनेट
					लामो उत्तर आउने प्रश्न	५	१०	

२. प्रथमपत्रको खण्ड क सबै समुहको लागि एउटै हुनेछ । प्रथमपत्रको खण्ड क समाप्त भएपछि एकै सिटिङ्ग खण्ड ख को परीक्षा हुनेछ । प्रथमपत्रको खण्ड ख र द्वितीयपत्रको पाठ्यक्रम एउटै हुनेछ ।

३. वस्तुगत प्रश्नमा प्रत्येक प्रश्नका चार वटा सम्भाव्य उत्तर दिइने छ । जस मध्ये एउटा सही उत्तर लेख्नु पर्नेछ । गलत उत्तर बापत प्रति गलत उत्तर २० प्रतिशतका दरले अंक घटाइनेछ ।

४. प्रथमपत्र र द्वितीयपत्रको परीक्षा फरक फरक हुनेछ ।

५. परीक्षाको माध्यम नेपाली वा अंग्रेजी भाषा हुनेछ ।

६. सामान्यत: प्रत्येक इकाईबाट प्रश्नहरु सोधिनेछन् । इकाईको अंकभार तोकिए बमोजिम हुनेछ । लामो उत्तर दिनुपर्ने प्रश्न एकै वा खण्ड खण्ड गरी (दुइ वा सो भन्दा बढी) सोध्न सकिनेछ ।

प्रथमपत्र:

खण्ड (क) आधारभूत सामान्य ज्ञान (प्राविधिक सेवा, तह-५ का सबै समूहका लागि):

१ नेपालको भूगोल: धरातलीय स्वरुपको किसिम र विशेषता, नदीनाला, तालतलैया र खनिज पदार्थ, राजनैतिक विभाजन (संघ,प्रदेश तथा स्थानीय तह)

२ नेपाल विद्युत प्राधिकरण सम्बन्धि जानकारी: स्थापना, नेपाल विद्युत प्राधिकरणका व्यवसाय/निर्देशनालयहरु, प्राधिकरणको काम, कर्तव्य र अधिकार, संचालक समिति

३ दक्षिण एशियाली क्षेत्रीय सहयोग संगठन (SAARC) बारे सामान्य जानकारी

४ राष्ट्रिय महत्वका समसामयिक घटना तथा नविनतम गतिविधिहरु ।

५ सामान्य गणितिय अभ्यास: अनुपात, भिन्न, प्रतिशत, औषत, अंकगणितिय तर्क, नाफा-नोक्सान, श्रेणीक्रम ।

६ विद्युत चोरी नियन्त्रण ऐन, २०५८ अनुसार विद्युत चोरी मानिने अवस्था, विद्युत चोरी नियन्त्रण नियमावली, २०५९ अनुसार विद्युत आपूर्ति बन्द गर्न सक्ने, पून: जडान गर्ने अवस्था र पुरस्कार व्यवस्था ।

७ विद्युत वितरण विनियमावली, २०६९ को विद्युत लाईन एवं मिटर जडान सम्बन्धी व्यवस्था र मिटर जाँच तथा मिटर रिडिङ्ग सम्बन्धी व्यवस्था ।

प्रथमपत्र खण्ड ख र द्वितीयपत्रको पाठ्यक्रम (मेकानिकल समूह)

1. SAFETY PRACTICES **[2x2=4, 1x5=5]**

1.1. Importance of Safety

1.2. Types of Safety

1.1.1. Personal Safety

1.1.2. Machine's Safety

1.1.3. Tools Safety

1.1.4. Workplace Safety

1.3. Knowledge of Industrial safety & Hygiene

1.4. Fire fighting

1.4.1. Firefighting Equipment

1.4.2. Classification of fire
1.4.3. Application of DCP and CO_2 in firefighting, chemical form
1.5. Safety rules, tools & devices

2. GENERAL CONCEPT [4x2=8, 2x5=10]

2.1 Diesel power plant and hydropower plant
2.1.1 General concept
2.1.2 Classification
2.1.3 Advantages and disadvantages
2.2 Important of Earthling and of Electrical and Mechanical Equipment.
2.3 Measuring tool and equipment
2.3.1 Metric, FPS, SI Unit
2.3.2 Conversion of unit
2.3.3 Fundamental & derived unit
2.3.4 Area, Perimeter, Weight, Density
2.3.5 Measuring Voltage, Current, Power and Energy
2.4 General ideal of fuse MCB and MCCB protection
2.5 Physical properties of Metal and difference between carbon steel and cast iron

3. OPERATION AND MAINTENANCE [5x2=10, 1x5=5, 2x10=20]

3.1 operation and maintenance planning and concept of various maintenance system
3.2 General operational rules, assignment, duties and communication, supervision, inspection and recording
3.2 Prerequisite for starting and stopping of generator in hydro and thermal station
3.3 Maintenance of runner, guide vanes and guide bearing
3.4 Maintenance of different gate and their operating device
3.5 concept and Maintenance of
3.5.1 Governor oil system
3.5.2 Lubricating oil system
3.5.3 Generator cooling system
3.5.2 Air-conditioning system and ventilation system
3.5.5 Compressed air System
3.5.6 Dewatering system of Power station
3.6 Condition monitoring and troubleshooting in power plant
3.7 record keeping of operation and maintenance work and data keeping.

4. **WORKSHOP PRACTICE [4X2=8, 1x5=5, 1x10=10]**

4.1. Welding
4.1.1. Arc welding - Principle, Tools, Equipment, Welding procedure.
4.1.2. Oxy-acetylene welding - Principle, Tools, Equipment, Welding procedure.
4.1.3 Type of Electrode and their application and care
4.1.4 Welding defect, causes and remedies and testing of welding defects.
4.1.5. Soldering & Brazing -Principle, Tools, Equipment, Procedure.
4.1.6. Safety Precaution in welding work.
4.3. Type of machine tools and equipment used in mechanical works shop
4.4 types of fits, uses of fits and tolerance
4.5 Type of non-destructive testing
4.6. Sheet metal and plumbing
4.6.1. Marking, Cutting, Folding, Bending, Joining & Soldering of Sheet Metal
4.6.2. Marking, Cutting, Bending, Threading, Joining and Sealing of Pipes
4.7. Basic Knowledge of lifting devices used in mechanical workshop including their operation
4.7.1. Chain hoist
4.7.2. Jacks
4.7.3. Gantry crane/ other cranes
4.7.4. Fork lift

5. HYDRAULIC, THERMODYNAMICS, I.C. ENGINES AND HYDRAULIC MACHINES. [5x2=10, 2x10=20]

5.1. Hydraulics and Hydraulic Turbines
- 5.1.1 Types of flow and basics of compressible and non-compressible flow
- 5.1.2 Frictional losses in flow, losses due to sudden enlargement and contraction.
- 5.1.1 Types of hydraulic turbines
- 5.1.2 Selection of Turbines with head and flow.
- 5.1.3 Function of runner, guide vanes, spiral casing, inlet valve, and shaft seal, guide bearing
- 5.1.4 Nozzles, Butterfly valve, needle vales, deflector and deflector servo mechanism
- 5.1.3 Governor and its function

5.2 Hydraulic pump and compressors
- 5.2.1 Different types of pumps and their selection and use.
- 5.2.2 Types of compressor and their use

5.3 Thermodynamics
- 5.3.1 Term used in thermodynamics
- 5.3.2 First law, Second law and Zeroth law of thermodynamics
- 5.3.3 Otto and Diesel cycle

5.4 IC Engines & automobiles
- 5.4.1 Difference between two stroke and four stroke engines
- 5.4.2 Difference between petrol and diesel engines
- 5.4.3 General concept of fuel system, Lubrication system, ignition system and cooling system in IC engines
- 5.4.4 Power train & braking system of automobiles and construction equipment

5.5 Governor in hydro and thermal power plant, speed drop and other parameters of governor
5.6 Different type of bearing, their application and replacement.
5.7 Working principle of hydraulic system of construction equipment.

6. FUELS AND LUBRICANTS [2x2=4, 2x5=10]

6.1. General knowledge on different types of fuels and lubricants used in machinery
6.2. Knowledge on application and changing interval of lubricants

7. KNOWLEDGE OF BASIC DRAWING [3x2=6, 1x5=5]

7.1. Scale & Dimensions
7.2. Symbols, Views
7.3. Parts and assembly drawing of joint
- 7.3.1. Permanent joint (Rivet and welding)
- 7.3.2. Temporary joint (Nut bolt, key and Spline joint)

8. AIR CONDITIONING [2x2=4, 1x5=5]

8.1 Introduction and layout of air-conditioning system
8.2 Introduction and function of different component of air-conditioning system
8.3 Type of refrigerant
8.4 Troubleshooting

9. INSTITUTIONAL KNOW-HOW [3x2=6, 1x5=5]

9.1 General knowledge of Nepal Electricity Authority
9.2 General knowledge regarding capacities of various power plants of Nepal and their locations
9.3 General knowledge on standard transmission and distribution voltage of Nepalese power system.

द्रष्टव्य: पाठ्यक्रममा राखिएका संविधान, ऐन, नियम र विनियमहरु परीक्षा हुनु भन्दा ३ महिना अगाडी सम्म संशोधन वा खारेज भई त्यसको सट्टा हाल प्रचलनमा रहेकालाई सोही अनुरुप पाठ्यक्रममा समावेश भएको मानिने छ ।

◆