

गण्डकी विश्वविद्यालय

जनशक्ति व्यवस्थापन समिति

प्राविधिक सहायक (४/५) तहको पाठ्यक्रम, २०८१

(विशेष आन्तरिक प्रतियोगिताका लागि मात्र)

विशेष आन्तरिक प्रतियोगिता अन्तर्गत प्राविधिक सहायक वा सो सरह (४/५) का सेवा समूहका पदहरूको लिखित परीक्षा तोकिएको पाठ्यक्रम भित्र रही देहायअनुसार सञ्चालन गरिने छ ।

क्र.सं.	पत्र	विषय	कुल अङ्क
१.	प्रथम पत्र	सम्बन्धित विषयगत ज्ञान वस्तुगत प्रश्न ।	३०
२.	द्वितीय पत्र	संविधान, ऐन नियम र विश्वविद्यालय सम्बन्धी ज्ञान विषयगत प्रश्न-१५ अङ्क	४५
		सम्बन्धित सेवा सम्बन्धी ज्ञान विषयगत पत्र-३० अङ्क	
जम्मा			७५

नोट:-

- १) परीक्षाको पुरा समय ३ घण्टाको हुनेछ। जसमध्ये वस्तुगत ३० मिनेटको हुनेछ। वस्तुगत पत्रको उत्तर पुस्तिका बुझाएपछि विषयगत प्रश्नपत्र उपलब्ध गराइने छ ।
- २) लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुन सक्नेछ ।
- ३) यस पाठ्यक्रममा जेसुकै लेखिएको भए तापनि पाठ्यक्रममा परेका ऐन, नियमहरू परीक्षाको मिति भन्दा १ महिना अगाडी (संशोधन भएका वा संशोधन भई हटाईएका वा थप संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।

Syllabus for Written Examination

Post: Electrician (5th level)

क) संविधान, ऐन नियम तथा सामान्य ज्ञान

१. नेपालको संविधान र यसको विकास क्रम (२००४ देखि २०७२ सम्म)
२. राष्ट्रिय तथा अन्तर्राष्ट्रिय समसामयिक घटनाक्रम, गतिविधि र प्रवृत्तिहरू
३. शिक्षा सम्बन्धी ऐन तथा नियमहरू (गण्डकी विश्वविद्यालय ऐन, २०७६, गण्डकी विश्वविद्यालयका नियमावलीहरू, विश्वविद्यालय अनुदान आयोग तथा उच्च शिक्षा, गण्डकी प्रदेश स्तरीय नीति तथा योजना)

1. Fundamentals on Electrical Engineering:

- (a) Concept of Electric charge, current, potential, EMF, conductor, semiconductor, insulator.
- (b) Series and parallel connection of resistance, inductance, and capacitance.
- (c) Ohm's laws, Kirchhoff's laws and its application.
- (d) Introduction to phase, phase difference, amplitude, average and rms values.
- (e) Generation of three phase voltage, star-delta/ delta-star connection.
- (f) Active and reactive power.
- (g) Heating effect of electric current.

2. Power Generation:

- (a) Sources of electrical energy, single line diagram of power supply system.

- (b) Hydroelectric power plant, its layout, main components, advantages and disadvantages, site selection, turbine types.
- (c) Substation types, substation equipment and their characteristics, bus bar and their arrangements.
- (d) Diesel generator plant, merit and demerits, characteristics.
- (e) Solar and wind power generation and its characteristics.
- (f) Automatic Voltage Regulator, Uninterrupted Power Supply.

3. **Transmission, Distribution and Consumer Services**

- (a) Single line diagrams of distribution system, installation, connection and protection of 11kV/400V distribution transformer, substation.
- (b) Handling electrical tools and equipment, selection of protective devices.
- (c) Transmission Lines: Necessity of high voltage transmission, line parameters, choice of voltage level, conductor spacing, voltage regulation, efficiency, sag, tension, clearance, supports, cross arms, insulating materials and their classification, Overhead Lines and underground cables.
- (d) Distribution System: Layout, voltage regulation, distribution transformer, single phase two wire configuration, three phase four wire configurations, conductor types, consumer supply connection, Energy meter.
- (e) Estimating and costing of distribution system for different electrical loads, load curve, load duration curve, load factor, diversity factor, plant factor, capacity factor, utilization factor.
- (f) Utilization of electrical energy on different sector, power factor and measures to correct low power factor.

4. **Electric Machines:**

- (a) Magnetic circuits, losses, hysteresis loop.
- (b) Transformer, its construction, basic principle, losses and efficiency, auto-transformer, colling of transformer, parallel operation, Buchholz protection.
- (c) DC Generator and types, characteristics, armature reaction, parallel operation.
- (d) DC and AC motors with their basic construction, working principles, characteristics, applications, speed control techniques.
- (e) Induction machines operating principle, torque - slip characteristics, speed control, starting techniques.
- (f) Synchronous machines basic construction, operating principle, alternator on no-load.
- (g) Black start units in power stations.

5. **Protection System and Repair/ Maintenance:**

- (a) Fuses: time-current and cut-off characteristics, types, rating, applications.
- (b) MCB, MCCB, ACB, VCB, SF6 circuit breakers, minimum oil circuit breaker.
- (c) Types of protective relays.
- (d) Lightning Arrestor - Characteristics; metal-oxide lightning arrestor – construction and operating principle; installation of building lightning arrestor.
- (e) Handling of ammeter, voltmeter, wattmeter, multi meter, insulation tester and earth tester, power analyzer, maximum demand meter, TOD meter.
- (f) Repair and maintenance of different electrical appliances, precautions in domestic, commercial, and industrial electrical installation.

6. **Electrical Safety Rules, Laws and Regulations:**

- (a) Effects of electric shocks, first aid requirements, safety and precaution against electric shocks.
- (b) Fire hazards and firefighting techniques.
- (c) Earthing of electrical equipment and its importance.
- (d) Concept of electrical energy development in Nepal, Rules for – consumer, standard voltage for distribution.
- (e) NEA distribution rules & regulations for 11kV and 400/ 230 V overhead line construction

standards.

(f) Electricity Act, 2009 and Electricity Regulation, 2010.

(g) Tariff structure for different consumer category.

7. Power Electronics:

(a) Concept of Diode, transistor, MOSFET, thyristor, rectifier and Inverter.

(b) Characteristics of power diode, power transistor.

(c) HVDC transmission line; advantage and disadvantages, application.