नेपाल सरकार
ऊर्जा जलस्रोत तथा सिंचाइ मन्त्रालय
वैकल्पिक ऊर्जा पर्वद्धन केन्द्र
प्राविधिक सेवा, पाँचां तह, प्राविधिक सहायक पदका प्रतियोगितात्मक परीक्षाको पाठ्यक्रम
एवं परीक्षा योजना

भाग १ : लिखित परीक्षा पूर्णाङ्क : २००

पत्र	विषय	पूर्णाङ्क	उतीर्णाङ्क	परीक्षा प्रणाली	प्रश्नसंख्या × अङ्क	समय
प्रथम	सामान्य ज्ञान	१००	४०	वस्तुगत	२५ प्रश्न ×२ अङ्क	२ घण्टा
				विषयगत	८ प्रश्न ×५ अङ्क १ प्रश्न ×१० अङ्क#	
द्वितीय	सेवा सम्बन्धी	१००	४०	वस्तुगत	२५ प्रश्न ×२ अङ्क#	२ घण्टा
				विषयगत	८ प्रश्न ×५ अङ्क १ प्रश्न ×१० अङ्क	

भाग २ : अन्तर्वार्ता पूर्णाङ्क : ३०

विषय	पूर्णाङ्क	परीक्षा प्रणाली
अन्तर्वार्ता #	३०	मौखिक

द्रष्टव्य :

१. यो परीक्षा योजनालाई भाग १ (लिखित परीक्षा) र भाग २ (अन्तर्वार्ता) गरी दुई भागमा विभाजन गरिएको छ ।
२. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।
३. वस्तुगत बहुवैकल्पिक **(Multiple Choice)** प्रश्नहरुको 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 ।
४. विषयगत प्रश्नमा प्रत्येक पत्र/विषयका प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरु हुनेछन् । परिक्षार्थीले प्रत्येक खण्डका प्रश्नहरुको उत्तर सोही खण्डका उत्तरपुस्तिकामा लेख्नपर्नेछ ।
५. यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकलेखिएकाभए तापनि पाठयक्रममा परेका कानून, ऐन, नियम तथा नीतिहरु परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई कायम रहेकालाई यस पाठक्रममा परेका सम्झन् पर्दछ ।
६. भाग १ को परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र भाग २ को परीक्षामा सम्मिलित गराइनेछ ।

प्रथम पत्र : सामान्य ज्ञान खण्ड (क)

१. नेपालको भौगोलिक, ऐतिहासिक, सामाजिक, आर्थिक र राजनैतिक अवस्था सम्वन्धी जानकारी
२. नेपालको प्राचीन इतिहास (लिच्छविकाल र मल्लकाल) र आधुनिक इतिहास (नेपालको एकीकरण देखि हालसम्म) को राजनीतिक घटनाक्रम, सामाजिक आर्थिक अवस्था
३. नेपालमा प्रचलित प्रमुख धर्म, जातजाति, भाषाभाषी र संस्कृति
४. चालु आवधिक योजनामा उर्जा नीति सम्बन्धी जानकारी
५. संयुक्त राष्ट्रसंघ, सार्क, बिमस्टेक, आसियान र युरोपियन संघ सम्वन्धी सामान्य जानकारी
६. दिगो विकास, वातावरण, प्रदुषण, जनसंख्या, शहरीकरण, बँसाईसराई, जलवायु परिवर्तन, जैविक विविधता, ऊर्जा संकट तथा ऊर्जा संरक्षण
७. ऊर्जाका किसिम, स्रोत र उपयोगिता एवं नेपालमा नवीकरणीय उर्जा प्रविधिको विकासक्रम तथा वैकल्पिक उर्जा पर्वद्धन केन्दको काम र कर्तव्य

प्रथम पत्र : नीति तथा कानून व्यवस्था खण्ड (ख)

१. नेपालको वर्तमान संविधान (भाग १,२,३,५ र अनुसूची १ देखि ९ सम्म मात्र)
२. भ्रष्टाचार निवारण ऐन, २०५९ (परिच्छेद २)
३. सार्वजनिक खरिद ऐन, २०६३ को (परिच्छेद १ र २)
४. मुलुकी देवानी संहिता २०७४, भाग ५ को परिच्छेद ६ र १८
५. नवीकरणीय ऊर्जा अनुदान नीति, २०७३ तथा नवीकरणीय ऊर्जा परिचालन कार्यविधि २०७३
६. वैकल्पिक ऊर्जा पर्वद्धन केन्द्र कर्मचारी सेवा शर्त नियमावली, २०६६

द्रष्टव्य : यस पत्रमा परीक्षामा यथासम्भव पाठ्यक्रमका सबै एकाईहरुबाट समान प्रश्नहरु सोधिनेछ ।

द्वितीय पत्र : सेवा सम्बन्धी

1. **Energy Resources**
   - 1.1 Perpetual, renewable and non-renewable energy resources
   - 1.2 Conventional and non-conventional; traditional and commercial
   - 1.3 Energy reserves and resources in Nepal
   - 1.4 Current status and importance of renewable energy resources in Nepal
2. **Construction Engineering and Construction Technology**
   - 2.1 Properties of building materials: physical, chemical, constituents, thermal
   - 2.2 Construction materials found in Nepal; suitability of different building materials for different zones, strength and quality production
   - 2.3 Rocks/stone: types of rocks, their characteristics and properties of good stone
   - 2.4 Metal and alloys: Ferrous metals and non-ferrous, steel (composition and properties); alloys (properties and uses); corrosion and its prevention
   - 2.5 Brick: types of bricks and sizes of bricks available in Nepal
   - 2.6 Lime and Surkhi: types, properties and its uses
   - 2.7 Timber and wood products: Structural classification -Soft wood and hard wood-defects in timber-seasoning of timber -preservation of timber, timber trees in Nepal, types and properties of wood
   - 2.8 Masonry: Classification-Stone masonry-Brick masonry -Laterite masonry composite masonry. Different types of stone masonry-General principles and specifications for stone masonry as per relevant codes
   - 2.9 Brick work: Brickwork preparation of trench plan methods of trench layout, different types of walls and their function, mortars for stone and brickwork, causes of dampness in building and remedies, terms used in brickwork (queen closer, king closer, meander, stretcher etc) different types of board, tools for laying bricks
   - 2.10 Cements: Composition, Compounds present, manufacturing methods-characteristics of cement, Types of cement-Properties of each-characteristics of cement-Tests on cement-Consistency test, fineness test. Sp. gravity test, setting time test, Soundness test. Puzzolona-definition-Common puzzolonas used as admixtures in cement

2.11 Aggregates: Sand: Sources of sand-River sand, Sea sand and pit sand-Limitations of mining of sand from rivers and sea shore-M-sand, alternatives of sand

2.12 Reinforced cement concrete-Qualities of materials-Types of reinforcement used characteristics of reinforcing material-waterproofing compounds

2.13 Concrete and reinforced concrete works: Constituents and properties of concrete, Water cement ratio, Grade and strength of concrete, concrete mix design, testing of concrete, preparation of mixing, placing compacting, curing and frameworks

2.14 Mortar: Preparation of lime and cement mortar-Proportions of mortar for various items of work-tests on cement mortar

2.15 Ornamental materials for finishing: Paints and Varnishes: Types – Constituents Preparation characteristics and application

2.16 Plastering work: function, preparation of mix, surface preparation, paints and white washes in walls and ceiling, stuff works.

2.17 Flooring: introduction, types of flooring (mud, brick, cement, flagstone, mosaic, floor-boards)

3. Roads and Bridges

3.1 Definition of road, Historical background, Classification of roads, Development of road network in Nepal, Road planning concept in Nepal, construction of small trails and used in rural areas, general design and layout construction of motorable road, types, construction and function of retaining wall, construction and function of drainage works use of bituminous materials in road,

3.2 General idea of construction equipment's and plants, Causes of damage to roads, road signs and signals

3.3 General idea of suspension bridge-layout, foundation etc. river training works and shoring in bridges

4. Surveying

4.1 Concept and purpose of surveying, principal of surveying, scale conventional signs in map principle of surveying classification of surveying, linear and angular measurement instruments, horizontal distance measurement.

4.2 Ranging out lines uses of water level, rubber tube level and builders level and field book. Different leveling instrument temporary adjustment, leveling procedure, types of leveling compass, its types, booking method, local attraction, methods of plane table, setting out instrument plane table introduction of theodolite and its uses

4.3 Different types of surveys used in road and irrigation work

5. Estimation and Costing: Purpose, Types and Methods of estimates; Units of measurements and modes of payment of various items of work and materials; Standard estimate formats of government of Nepal, Rate analysis and Norms (rate analysis norms prepared by Ministry of Works and Transport and the district rates prescribed by district development committee), Standard Rate analysis and Norms, preparing bill of quantities, muster roll, contract system, safety of construction site, storing of materials, purchase and receive materials, specifications (understanding, purpose, types and necessity), valuation (concept, purpose and methods)

6. Drawing : Concept, aims, used and importance of drawing, Drawing tools and instruments and their uses, Drafting techniques and methods in common practice, Introduction to Computer Aided Drafting (CAD) Software

7. Basic Electrical and Electronics

7.1 Current, voltage and resistance, types of electrical measuring equipments, electric field, capacitors, electromagnetic inductance and application, electric circuit (series, parallel and mixed circuits), applications of Ohm’s law and Kirchoff’s law, A.C. circuits -alternating current generation, ohmic resistance, inductive reactance, capacitance and impedance, electrical machines (transformer, A.C/D.C. motors, generators) -working principle, construction and types

7.2 Introduction to electronics and applications in different fields, active and passive components, voltage and current sources, semiconductor physics, behaviour functioning of P.N. junction, Diodes and applications, bipolar transistors and switching characteristics, injunction transistor, MOS transistors and switching characteristics, TTL logic circuits, NMOS/CMOS logic circuits, memory (RAM, DRAM, PROM, EPROM), operational amplifiers, filters, A/D converters, adders, oscillators, seven segment display, amplifier, heat sinks and relays

8. **Electronic Devices and Circuits**

8.1 Classification of materials (conductor, semiconductor and insulator), electrical properties and magnetic materials, rectifier, filter circuits, brief idea and typical applications of power diode, Zener diodes, Varactor diode, tunnel diode and point contact diode, transistor biasing and stablisation of operating point, switches and connectors, conventional representation of electric and electronic circuit elements

8.2 Electronic circuit design (single stage and multiple stage amplifier, voltage amplifier, feedback amplifier and power amplifier, differential and operational amplifiers), oscillators (negative and positive feedback), speed control of DC and AC motor by using thyristor, frequency response

9. **Computer and Digital Techniques**

9.1 Basic knowledge of computer hardware and software, networking internet, intranet, modems, computer protocols and basic computer architecture, applications and advantages of digital systems, number systems and conversion methods

9.2 Digital fundamentals -logic gates, flip-flop, codes and parity, arithmetic circuits, decoders, display devices and associated circuits, design system building blocks – half adder, full adder, encoder, decoder, multiplexer, de-multiplexer, memories, counters, shift registers, latches, clock, triggering, A/C and D/C converters, Boolean algebra

10. **Instrumentation and Control System**

10.1 Multimeter, oscilloscopes, signal generator, impedance bridges, transducers (strain guages, thermistor, piezoelectric tachometer, thermocoupler), open loop and closed loop control system, frequency response

10.2 Measuring instruments, moving coil meter, moving iron meter, frequency meter, energy meter, multimeter, clamp-on tester, megger

11. **Power supplies**

11.1 Single phase and three phase AC power supply systems, star/delta connection, rectifiers and filters, regulated power supply system, uninterruptible power supply systems

11.2 Basic knowledge of diesel/petrol/gas/thermal generators, solar power system, storage batteries, electric motors, DC supply, voltage and current regulators, inverters, isolation and power transformers, surge protectors, earthing system, lightning protection

द्रष्टव्य : यस पत्रमा परीक्षामा यथासम्भव पाठ्यक्रमका सबै एकाईहरुबाट समान प्रश्नहरु सोधिनेछ ।