नेपाल विद्युत् प्राधिकरण

प्राविधिक सेवा, कम्प्युटर ईन्जिनियरिङ्ग समूह, तह–७ ईन्जिनियर पदको

खुल्ला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

१. शैक्षिक योग्यता: प्रचलित कर्मचारी सेवा विनियमावलीमा व्यवस्था भए अनुसार ।

२. लिखित परीक्षाको विषय, पूर्णांङ्क, परीक्षा प्रणाली, प्रश्नसंख्या, अंकभार र समय निम्नानुसार हुनेछ ।

पत्र	विषय	पूर्णांङ्क	परीक्षा प्रणाली		प्रश्न संख्या	प्रति प्रश्न अंकभार	समय
प्रथम	कम्प्युटर ईन्जिनियरिंङ्ग **(I)**	३०	वस्तुगत वहुउत्तर		३०	१	३० मिनेट
द्वितीय	कम्प्युटर ईन्जिनियरिंङ्ग **(II)**	७०	विषयगत	छोटो उत्तर	८	५	२ घण्टा ३० मिनेट
				लामो उत्तर	३	१०	

३. वस्तुगत वहुउत्तर परीक्षा प्रणाली प्रश्नको उत्तर लेख्दा केरमेट गरेको, दोहोरो लेखेको, सच्याएको, निर्दिष्ट स्थानभन्दा अन्यत्र लेखेको वा उत्तर नै सारेकोलाई गल्ती मानिनेछ ।

४. वस्तुगत वहुउत्तर परीक्षा प्रणाली प्रश्नमा प्रत्येक गलत उत्तर वापत सो प्रश्न वापत पाउने अंकको ०.२ (बीस प्रतिशत २०%) का दरले सो बिषयमा पाएको कुल प्राप्तांकबाट घटाईनेछ ।

५. कालो/नीलो मसी मात्र भएको डटपेन/कलमले उत्तरको लागि निर्धारित कोठाका प्रश्नमा क,ख,ग,घ मध्ये एउटा मात्र सहि उत्तर स्पष्ट रुपले लेख्नूहोला । पेन्सिलले लेखेकोलाई मान्यता दिइने छैन ।

६. प्रथम र द्वितीयपत्रको परीक्षा २ पटक गरेर हुनेछ । प्रथमपत्रको परीक्षा सकिएपछि द्वितीयपत्रको परीक्षा तत्काल हुनेछ ।

७. द्वितीयपत्रको लिखित परीक्षाको माध्यम नेपाली वा अंग्रेजी भाषा हुनेछ ।

प्रथमपत्र र द्वितीयपत्रको पाठ्यक्रम विवरण

1. Digital Logic Fundamental

Digital and analog system, Numbering system, logic gates, Boolean algebra, Combinational logic circuits, Sequential logic circuits, arithmetic operator and circuits, decoders, multiplexers, demultiplexer, Flip Flops, Counters and registers, Memory devices.

2. Computer Architecture and organization

Basic computer organization and design, Computer Instruction, Timing and control, Execution of instruction, Input-output and Interrupt, Addressing modes, processor bus organization, stack organization, Microprocessor organization, RISC / CISC architecture, I/O devices, Asynchronous data transfer, DMA, I/O organization, memory system

3. Computer system software

Machine languages, Assembly language, Interpreters and Compilers

4. Operating system

Concept of process, preemptive and non- preemptive process, Symmetric Multiprocessing, parallel processing. Micro-kernels, Concurrency, Mutual Exclusion and synchronization, deadlock, Scheduling, Memory Management, Input/ Output and files: I/O devices and organization, Files and directories organization, file system implementation, different types of OS (DOS, UNIX, LINUX, WINDOWS), Distributed Systems: Distributed Message passing, RPC, Client/ Server architecture, Clusters, Security: Authentication and access authorization, system flows and attacks, trusted system.

5. Structure and object oriented programming

Types of data, data representation, data structure, arrays, operators, variables and assignments, control structures, procedure/function, Class definitions, encapsulation, inheritance, object composition, polymorphism, pattern and framework.

6. Fundamental of Software Engineering

Software Process: Software life cycle model, risk-driven approaches, software project management, Software requirements, Software design, Implementation, maintenance, SE issue (Formal issue, tools and environments for software engineering, role of programming paradigm, process maturity and improvement, ISO standards, CASE tools)

7. Computer Networks

OSI model,

Network layer: Services, datagram and virtual circuits, routing principles and algorithms, Internet protocol, IP addressing, IP transport, fragmentation and assembly, Internet Control Message Protocol, routing on the internet, routing information protocol, Open Shortest path first, routing intervals, IPv6.

Transport Layer: Principles, multiplexing and demultiplexing, UDP, TCP, flow control, principles of congestion control, TCP congestion control.

Application layer: Web and web caching, File transfer protocol, E-mail, Internet, Intranet, Domain Name Service, Socket programming.

Distributed system and clusters

8. Data Structures

Abstract data type, Time and space analysis of algorithms, Big oh and theta notations, Average, best and worst case analysis, linear data structures, binary tree, representations and traversals, Binary search trees, balancing trees, AVL trees, Greedy methods, priority queue search, Exhaustive search, Divide and conquer, dynamic programming, Recursion, Hashing, Graphs, digraphs, Sorting.

9. Database Management System

The relational model, ER model, SQL, Functional dependency and relational database design, file structure, Transaction management and concurrency control, Crash Recovery, query processing and optimization, indexing, distributed database systems and object oriented database system, data mining and data Warehousing, security Management system.

10. Power and Environmental Conditioning

Power requirements for computer installation, UPS, Environmental conditioning requirements for computer installation.

11. Economic and Financial Analysis

Methods of economic/financial analysis such as cost-benefit ratio, internal rate of return, net present worth, payback period, minimum attractive rate of return and their application, risk analysis, tariff structure.

12. Institutional Know-How

a) General knowledge of Nepal Electricity Authority, its organizational structure and function of various business groups.
b) General knowledge of various power plants of Nepal, their types, salient features and their geographical locations.
c) General knowledge on Nepalese Power Transmission System, Voltage levels and Lengths, export-import links for Power exchange with India.

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