

## चिलिमे जलविद्युत कम्पनी लिमिटेड

प्राविधिक सेवा, कम्प्युटर समूह, तह-७, कम्प्युटर ईन्जिनियर पदको  
खुला प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

- शैक्षिक योग्यता: चिलिमे जलविद्युत कम्पनी लिमिटेड कर्मचारी सेवा शर्त विनियमावलीमा व्यवस्था भए अनुसार ।
- लिखित परीक्षाको विषय, पूर्णाङ्क, परीक्षा प्रणाली, प्रश्न संख्या, अंकभार र समय निम्नानुसार हुनेछ ।

पत्र	विषय	परीक्षा प्रणाली	प्रश्न संख्या	प्रति प्रश्न अंकभार	पूर्णांक	समय	
प्रथम	सेवा सम्बन्धी जनरल सर्भे	वस्तुगत बहुउत्तर	३०	०.५	१५	३० मिनेट	
द्वितीय	सेवा सम्बन्धी	विषयगत	लामो उत्तर	२	१०	७०	२ घण्टा ३० मिनेट
			छोटो उत्तर	१०	५		
अन्तर्वार्ता					१५		

- वस्तुगत बहुउत्तर परीक्षा प्रणालीमा प्रत्येक पश्नका चार वटा सम्भाव्य उत्तर दिइने छ । प्रश्नको उत्तर लेख्दा केरमेट गरेको, दोहोरो लेखेको, सच्याएको, निर्दिष्ट स्थानभन्दा अन्यत्र लेखेको वा उत्तर नै सारेकोलाई गल्ती मानिनेछ ।
- वस्तुगत बहुउत्तरमा प्रत्येक गलत उत्तर वापत सो प्रश्न वापत पाउने अंकको ०.२ (बीस प्रतिशत २०%) का दरले सो विषयमा पाएको कूल प्राप्तांकबाट घटाइनेछ ।
- कालो/नीलो मसी मात्र भएको डटपेन/कलमले उत्तरको लागि निर्धारित कोठाका पश्नमा क,ख,ग,घ मध्ये एउटा मात्र सही उत्तर स्पष्ट रूपले लेख्नुहोला । पेन्सिलले लेखेकोलाई मान्यता दिइने छैन ।
- प्रत्येक पत्रको न्यूनतम ४० प्रतिशत उत्तीर्णाङ्क हुनेछ ।
- प्रथम र द्वितीयपत्रको परीक्षा २ पटक गरेर हुनेछ । प्रथम पत्रको परीक्षा सकिएपछि द्वितीयपत्रको परीक्षा तत्काल हुनेछ ।
- द्वितीयपत्रको लिखित परीक्षाको माध्यम नेपाली वा अंग्रेजी भाषा हुनेछ ।
- सामान्यतः प्रत्येक शिर्षकको अंकभार तोकिए बमोजिम हुनेछ ।

### प्रथमपत्र र द्वितीयपत्रको पाठ्यक्रम बिवरण:

#### 1. **Digital Logic Design [2X0.5]**

Number Systems and Codes, Boolean algebra and Logic Gates, Combinational & Sequential Logic Design, Digital Logic Families

#### 2. **Computer Architecture and organization [3X0.5]**

Difference between 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. **Operating system [2X0.5]**

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.

4. **Structure and object oriented programming [2X0.5]**

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.

5. **Software Engineering [2X0.5]**

Software Processes, Agile software development, Software Requirements, Requirements Engineering, System Models, Distributed Systems, Application Architecture, Rapid Software Development, Verification and Validation/Testing

6. **Data Communications and Computer Networks [3X0.5]**

Network fundamentals, Bandwidth and propagation delay, Latency and throughput, internet model, OSI model, Error detection and correction, Control and protocols, Point-to-point and multiple access protocols, Local area networks, connecting LANs (bridges).ATM networks, Network layer, internet protocols, Host-to-host delivery —routing (unicast, multicast) and addressing ,Link state and distance vector routing, Sub-netting and super-netting, End-to-end protocols — UDP, TCP,TCP sliding window, TCP adaptive timeout interval, Congestion control and quality of service

7. **Data Structures [2X0.5]**

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.

8. **Database Management System [2X0.5]**

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. .

9. **Artificial Intelligence [2X0.5]**

Natural language processing, Learning, planning, Game playing, automated reasoning, Machine learning Basics, Vision and robotics

**10. Theory of computation [2X0.5]**

Finate Automata, Context Free Grammars and Languages, Simplification of CFG, Chomsky normal form — Problems related to CNF and GNF, Pushdown Automata, Turning Machine, Introduction to Computational Complexity: Definitions-Time and Space complexity of TMs — complexity classes — introduction to NP-Hardness and NP-Completeness.

**11. Emerging technology [2X0.5]**

Simulation and modeling, Distributed and cloud computing, Big data, Internet of Things, Cryptography and network security, embedded system, Multimedia system

**12. Power and Environmental Conditioning [2X0.5]**

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

**13. Economic and Financial Analysis [2X0.5]**

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.

**14. Institutional Know-How [2X0.5]**

- General knowledge of Chilime Hydropower Company Limited, its organizational structure and function of various business groups.
- General knowledge of various power plants of Nepal, their types, salient features and their geographical locations.
- General knowledge on Nepalese Power Transmission System, Voltage levels and lengths, export-import links for Power exchange with India.

