

**काठमाडौं उपत्यका खानेपानी लिमिटेड**  
**प्राविधिक सेवा, सूचना प्रविधिसमूह, ५ तह, ओभरसियर(IT) पदको खुल्ला तथा समावेश र आन्तरीक**  
**प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम**

पाठ्यक्रमको रूपरेखा :- यस पाठ्यक्रमको आधारमानिम्नानुसार दुई चरणमा परीक्षालिइने छ :

प्रथम चरण :- लिखित परीक्षा पूर्णाङ्क :- २००  
द्वितीय चरण :- अन्तर्वार्ता पूर्णाङ्क :- २०

प्रथम चरण – लिखित परीक्षायोजना(Examination Scheme)

पत्र	विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	प्रश्न संख्या X अङ्कभार	समय
प्रथम	कम्प्युटर	१००	४०	वस्तुगत बहुउत्तर (Multiple Choice)	५० X २ = १००	१ घण्टा
द्वितीय	इन्जिनियरिङ्ग र KUKL सम्बन्धी	१००	४०	विषयगत (Subjective)	८ X ५ = ४० र ६ X १० = ६०	३ घण्टा

द्वितीय चरण

विषय	पूर्णाङ्क	परीक्षा प्रणाली
व्यक्तिगत अन्तर्वार्ता	२०	मौखिक

- लिखित परीक्षाको माध्यमभाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुन सक्नेछ।
- लिखित परीक्षाका प्रश्न संख्या र अंक भार निम्नानुसार हुनेछन्।

Course Unit	Topics	वस्तुगत बहुउत्तर (Multiple Choice) Marks	विषयगत (Subjective)
1	Computer Fundamental	5x2=10	10
2	Hardware Maintenance and Trouble Shooting	2x2=4	5
3	Operating System	5x2=10	10
4	Networking	8x2=16	5+10=15
5	Office Package (Word Processing, Spreadsheet and Presentation system )	5x2=10	10
6	Web Technology	3x2=6	5
7	Database Management System	5x2=10	5+10=15
8	Software Engineering	3x2=6	5
9	Relevant Laws and Agencies	3x2=6	5
10	Management Information System	3x2=6	5
11	Object Oriented and Data Structure	8x2=16	5+10=15
	Total:	50x2=100	100

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३. वस्तुगत बहुउत्तर (Multiple Choice) प्रश्नहरूको उत्तर सहीदिएमा प्रत्येक सही उत्तर बापत २ (दुई) अङ्क प्रदान गरिनेछ भने गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २० प्रतिशत अर्थात् ०.४ अङ्क घटा गरिनेछ । तर उत्तर नदिएमा त्यस बापत अङ्क दिइने छैन र अङ्क घटापनि गरिने छैन।
४. यस पाठ्यक्रममा जेसुकै लेखिएको भएतापनि पाठ्यक्रममा परेका ऐन, नियमहरू परीक्षाको मितिभन्दा ३ (तीन) महिना अगाडि (संशोधन भएका वा संशोधन भई हटाइएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा रहेको सम्झनु पर्दछ।
५. लिखित परीक्षाबाट छनौट भएका परीक्षार्थीहरूले मात्र अन्तर्वार्तामा भाग लिन पाउनेछन्।
६. पाठ्यक्रम लागु मिति २०७४ आश्विनदेखि

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सेवा (कम्प्युटर इन्जिनियरिङ्ग र KUKL) सम्बन्धि पाठ्यक्रम (50x 2 + 100 = 200 Marks)

**1. Computer Fundamentals**

- 1.1. Computer:- Introduction ; Characteristics, Types and Applications of Computer
- 1.2. Overview of a computer system:-
  - 1.2.1. Hardware
    - 1.2.1.1. Input Unit: Keyboard, Mouse and Scanner
    - 1.2.1.2. CPU: Arithmetic Logic Unit, Control Unit, Memory Unit
    - 1.2.1.3. Output Unit: Monitor, Printer, etc.
    - 1.2.1.4. Storage devices: Primary Memory (RAM, ROM, Cache, Register) & Auxiliary Memory (Floppy Disk, Hard Disk, Compact Disk, DVD, Flashdisk)
    - 1.2.1.5. Others: Network card, Modem, Sound card, etc.
  - 1.2.2. Software:- Definition, Types of Software and Programming language
- 1.3. Introduction to ASCII, Unicode standards and font types
- 1.4. Security
  141. Physical Security of Information Technology Infrastructure
  142. Digital security: Antivirus, Firewalls, Antispyware, User authentication types, IPS/IDS
  143. Common security threats: Social engineering, Malware, Phishing, Spyware, Viruses, Worms, Trojans, Distributed Denial of Services
- 1.5. Basic electronics
  151. Difference between vacuum tube and semiconductor
  152. Working principle and use of:- P-N junction diode, Zener diode, light emitting diode, Bipolar junction transistor
  153. Basic concept of integrated circuits and its use

**2. Hardware Maintenance and Troubleshooting**

- 2.1. Hardware Maintenance
  - 2.1.1. Configure and apply BIOS settings
  - 2.1.2. Motherboard components, their properties and purposes (RAM slots, Chipsets, Jumpers, CPU sockets, etc)
  - 2.1.3. Installing and configuring expansion cards (Sound cards, Network cards, Graphics cards, etc)
  - 2.1.4. Installing and configuring storage devices
  - 2.1.5. Types and features of display devices (CRT, LCD, LED, Plasma)
  - 2.1.6. Connector types (BNC, RJ45, HDMI) and associated cables.
  - 2.1.7. Installing and configuring various peripheral devices

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(Mouse, Keyboard, Scanner, Printer, Speaker)

2.2 Troubleshooting

2.2.1 Troubleshooting of computer and its peripherals (keyboard, mouse, printer, scanner, speaker)

2.2.2 Troubleshooting of connectivity (cables, network, etc)

2.2.3 Troubleshooting of memory, processor, storage, display

2.2.4 Troubleshooting of operating system and application software

**3. Operating System**

3.1. Introduction, Types and Functions of operating systems,

3.2. Basic components of the operating systems

3.3. Concept of file, folder, shortcut, desktop, etc.

3.4. Introduction to the Windows Family of Products and Unix Family of Products

3.5. Installation, backup, recovery and optimization of operating system

3.6. Managing information storage, disks and partitions

3.7. Managing Directory service, Users, Groups and Permissions

3.8. Managing Network Printing

3.9. Sharing file, folder, printer, application etc.

3.10. Installation and configuration of device drivers, applications, fonts

3.11. Identifying and managing Security Threats to Operating Systems

3.12. Process Management, Memory Management, I/O Management

**4. Networking**

4.1. Basic Networking: Definition, Types, Topologies

4.2. Client server and peer to peer network

4.3. Connectivity and media: Network cables and connectors

4.4. OSI Reference model

4.5. Common TCP and UDP ports, protocols, and their purpose (e.g. Http, Ftp etc.)

4.6. Network devices their functions, features and configuration. (Switch, Router, Access point, Modem, Firewall etc.)

4.7. Application of Network utilities (e.g. IPCONFIG, PING, TRACERT, NSLOOKUP)

4.8. Network Cabling and Cable Testing

4.9. Familiarity with IP Addressing, subnet mask, gateway, DNS, WINS, static and automatic address assignment

4.10. Data Encryption standards.

4.11. Multiplexing and multiple access technique, switching technique and system

**5. Office Package (Word Processing, Spreadsheet and Presentation System)**

5.1. Concept of Office Package

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- 5.2. Creating, Saving and Opening the documents
- 5.3. Editing and formatting (Text, Paragraph, Page, Cells, Rows, Columns, Worksheet, Slides etc.) of documents
- 5.4. Copying, Moving, Deleting Finding and Replacing, Bullets and Numbering, Tables, Borders and Shading, Indentation and Tab Setting, Columns, Header, Footer, Footnotes, Endnotes, Page Numbers, Page break, Section break, Graphics, Pictures, Charts, Word Art, Symbols, Creating and editing Charts
- 5.5. Mail Merge
- 5.6. AutoCorrect, Spelling and Grammar Checking, and Thesaurus
- 5.7. . Using Formula with Relative Cell and Absolute Cell Reference
- 5.8. Using Functions
- 5.9. Formatting Slides, Slide Show and Animations
- 5.10. Document Security
- 5.11. Document previewing and Printing
- 6. Web Technology**
  - 6.1. Introduction to Web Page and Content Management System
  - 6.2. Introduction to HTML
  - 6.3. HTML document
    - 6.3.1. HTML Tags
    - 6.3.2. Working with Text, Hyperlinks, Images, Lists, Forms, Tables, Frames, etc.
  - 6.4. Familiarity with Cascading Style Sheet, Rich Site Summary and social networking
  - 6.5. Concept of Web server and Proxy server
  - 6.6. Social media governance
  - 6.7. E-Commerce
- 7. Database Management System**
  - 7.1. Introduction to Database and Database Management System
  - 7.2. Database design and Normalization
  - 7.3. Basic concept of Tables, Fields, Records, Relationships and Indexing
  - 7.4. Introduction to database applications
  - 7.5. Common data types, Data models, Relational Database and its design**
  - 7.6. Familiarity with Structured Query Language statements for manipulating database objects and information from database
  - 7.7. Creating, modifying and deleting forms/reports
  - 7.8. Crash Recovery, Concurrency Control and Security
- 8. Software Engineering**
  - 8.1. Introduction to software engineering
  - 8.2. System Analysis and Design
  - 8.3. Software development lifecycle, software project management
  - 8.4. Software design, requirement analysis and specification
  - 8.5. Software reliability, testing and maintenance

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**9. Relevance Laws and Agencies**

- 9.1. Electronic Transaction Act, 2063
- 9.2. IT Policy and IT related agencies
- 9.3. Historical background and current Organization structure of Kathmandu Upatyaka Khanepani Limited (KUKL)

**10. Management Information System**

- 10.1 Introduction to Management Information System
- 10.2 Strategic Management of Business
- 10.3 Information security challenges in Enterprises
- 10.4 Information Technology Impact on society
- 10.5 Decision support systems and Knowledge Management and Decision making
- 10.6 Development and applications of MIS
- 10.7 Communication networks and Client server architecture
- 10.8 Data Warehouse and Data mining

**11. Object Oriented and Data structure**

- 11.1 Object Oriented Programming, C++ Language Basics
- 11.2 Object and Class, Overloading Operators, inheritance, and virtual function
- 11.3 Object Oriented Analysis and design, UML
- 11.4 Stack and Queue, Link list as an ADT, Recursion
- 11.5 Trees, Sorting, Search and Graph