

निजामती कर्मचारी अस्पताल
प्राविधिक सेवा, ईञ्जिनियरिङ एण्ड मेन्टेनेन्स समूह, कम्प्यूटर उपसमूह, कम्प्यूटर टेक्निसियन पद, पाँचौं तहको
खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम
यस पाठ्यक्रम योजनालाई दुई चरणमा विभाजन गरिएको छ :

प्रथम चरण :- लिखित परीक्षा (Written Examination)

पूर्णाङ्क :- २००

द्वितीय चरण :- (क) प्रयोगात्मक परीक्षा

पूर्णाङ्क :- ५०

(ख) अन्तर्वार्ता (Interview)

पूर्णाङ्क :- ३०

प्रथम चरण (First Phase) : परीक्षा योजना (Examination Scheme)

पत्र	विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली		प्रश्नसंख्या X अङ्क	समय
प्रथम	Technical Subject	१००	४०	वस्तुगत	बहुवैकल्पिक प्रश्न	५० प्रश्न x २ अङ्क	४५ मिनेट
द्वितीय		१००	४०	विषयगत		१० प्रश्न x १० अङ्क	३ घण्टा

द्वितीय चरण (Second Phase)

विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	समय
प्रयोगात्मक परीक्षा	५०	२५	प्रयोगात्मक	१ घण्टा
अन्तर्वार्ता	३०	-	मौखिक	

द्रष्टव्य :

- यो परीक्षा योजनालाई प्रथम चरण र द्वितीय चरण गरी दुई चरणमा विभाजन गरिएको छ ।
- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।
- प्रथम र द्वितीय पत्रको पत्रको विषयवस्तु एउटै हुनेछ ।
- प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै हुनेछ ।
- परीक्षामा सोधिने प्रश्नसंख्या, अङ्क र अङ्कभार यथासम्भव सम्बन्धित पत्र/विषयमा तोकिए अनुसार हुनेछ ।
- वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरूको 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 ।
- वस्तुगत बहुवैकल्पिक हुने परीक्षामा परीक्षार्थीले उत्तर लेख्दा अंग्रेजी ठूलो अक्षर (Capital letter) A, B, C, D मा लेख्नुपर्नेछ । सानो अक्षर (Small letter) a, b, c, d लेखेको वा अन्य कुनै सङ्केत गरेको भए सबै उत्तरपुस्तिका रद्द हुनेछ ।
- बहुवैकल्पिक प्रश्नहरू हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।
- विषयगत प्रश्नका लागि तोकिएका १० अङ्कका प्रश्नहरूको हकमा १० अङ्कको एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरू (Short notes) सोध्न सकिने छ ।
- विषयगत प्रश्नमा प्रत्येक पत्र/विषयका प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन् । परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरूको उत्तर सोही खण्डका उत्तरपुस्तिकामा लेख्नुपर्नेछ ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भए तापनि पाठ्यक्रममा परेका कानून, ऐन, नियम तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।
- पाठ्यक्रम लागू मिति :-

निजामती कर्मचारी अस्पताल
प्राविधिक सेवा, ईन्जिनियरिङ एण्ड मेन्टेनेन्स समूह, कम्प्यूटर उपसमूह, कम्प्यूटर टेक्निसियन पद, पाँचौं तहको
खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

Paper I and II: Technical subject

Section (A): 50 % Marks

1. Computer Fundamentals

- 1.1. Introduction, Characteristics, Types and Applications of Computer
- 1.2. Overview of a computer system:-
 - 1.2.1. Hardware: Input Unit, CPU and Output Unit, and Storage devices
 - 1.2.2. Software:- Definition and types of Software
- 1.3. Introduction to ASCII, Unicode standards and font types
- 1.4. Basic electronics and communication
 - 1.4.1. Difference between vacuum tube and semiconductor
 - 1.4.2. Basic concept of integrated circuits and its use
 - 1.4.3. Communication System: definition, types, and elements of communication system
- 1.5. Smart phone, tablets and computing devices

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, DVI) and associated cables
 - 2.1.7. Installing and configuring various peripheral devices (Mouse, Keyboard, Scanner, Printer, Speaker)
 - 2.1.8. Setting UPS and Power Backup
- 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
- 2.3. Data Backup and recovery: Concepts and Methods

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. Sharing file, folder, printer, application, etc.
- 3.9. Installation and configuration of device drivers, applications, fonts
- 3.10. Installation of Operating System in Server Setup

निजामती कर्मचारी अस्पताल
प्राविधिक सेवा, ईञ्जिनियरिङ एण्ड मेन्टेनेन्स समूह, कम्प्यूटर उपसमूह, कम्प्यूटर टेक्निसियन पद, पाँचौं तहको
खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

4. Networking

- 4.1. Basic Networking: definition, types, and 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, static and dynamic address assignment
- 4.10. Concept of Cloud based services (Drop box, Google Cloud, iCloud, etc.)

5. Computer Architecture

- 5.1. Basic Structures: sequential circuits, design procedure, state table and state diagram, Von Neumann / Harvard architecture, RISC/CISC architecture
- 5.2. Addressing methods and programs, representation of data, arithmetic operations, basic operational concepts, bus structures, instruction, cycle and excitation cycle
- 5.3. Processing Unit: instruction formats, arithmetic and logical instruction
- 5.4. Addressing modes
- 5.5. Input Output Organization : I/O programming , memory mapped I/O, basic interrupt system, DMA
- 5.6. Memory Systems

6. Database Management System

- 6.1. Introduction to Database and Database Management System
- 6.2. Database design and Normalization
- 6.3. Basic concept of Tables, Fields, Records, Relationships and Indexing
- 6.4. Introduction to database applications
- 6.5. Common data types
- 6.6. Familiarity with Structured Query Language statements for manipulating database objects and information from database
- 6.7. Creating, modifying and deleting forms/reports
- 6.8. Basics of MySQL and PostGres Database

Section (B): 50 % Marks

7. Application Package

- 7.1. Word Processing
 - 7.1.1. Concept of Word Processing
 - 7.1.2. Creating, Saving and Opening the documents
 - 7.1.3. Editing and formatting document: copying, moving, deleting, finding and replacing text; Bullets and Numbering; Tables, Borders and Shadings; Indentation and Tab Setting; Columns, Header, Footer, Page Numbers; References, Footnotes, and Endnotes; Page break and Section break; Graphics, Pictures, Charts, Word Art, Symbols & Organization Chart
 - 7.1.4. AutoCorrect, Spelling and Grammar Checking, and Thesaurus
 - 7.1.5. Mail Merge

निजामती कर्मचारी अस्पताल
प्राविधिक सेवा, ईजिनियरिङ एण्ड मेन्टेनेन्स समूह, कम्प्यूटर उपसमूह, कम्प्यूटर टेक्निसियन पद, पाँचौं तहको
खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

- 7.1.6. Document security
- 7.1.7. Document previewing and printing
- 7.2. Spreadsheet
 - 7.2.1. Concept of Electronic Spreadsheet
 - 7.2.2. Creating, Opening and Saving Work Book
 - 7.2.3. Editing, Copying, Moving, Deleting Cells/Rows/Columns/Range/Worksheets
 - 7.2.4. Formatting (Cells, Rows, Columns, Worksheets, etc.)
 - 7.2.5. Using Formula with Relative Cell and Absolute Cell Reference
 - 7.2.6. Using Functions
 - 7.2.7. Creating and editing Charts
 - 7.2.8. Inserting Header and Footer, Page Setting, Previewing and Printing
- 7.3. Presentation System
 - 7.3.1. Introduction to presentation applications
 - 7.3.2. Creating, Opening & Saving presentation
 - 7.3.3. Formatting Slides
 - 7.3.4. Slide Show and animation
 - 7.3.5. Inserting Built-in picture, Table, Chart, Graphs, and Organization Chart etc.
 - 7.3.6. Exporting and printing slides
- 8. **Programming Concept and Data Structure**
 - 8.1. Concept of Procedural Programming, Declarative Programming, Structural Programming and Object-Oriented Programming
 - 8.2. Concept of Algorithm, Flowchart and Pseudo code
 - 8.3. Concept of C programming, C++ Programming, JAVA Programming
 - 8.4. Basic Concept of control, loop, array and function
 - 8.5. Introduction of Data structure and Abstract data Type
 - 8.6. Linear data structures, Lists, Linked Lists, Stacks, Queues
 - 8.7. Recursive Algorithms
 - 8.8. Sorting Algorithms
- 9. **Web Technology, Social Media and Video Conference**
 - 9.1. Introduction to Web Page and Content Management System
 - 9.2. Introduction to HTML
 - 9.3. HTML document
 - 9.3.1. HTML Tags
 - 9.3.2. Working with Text, Hyperlinks, Images, Lists, Forms, Tables, Frames, etc.
 - 9.4. Familiarity with Cascading Style Sheet, Rich Site Summary and social networking
 - 9.5. Concept of Web server and Proxy server
 - 9.6. Use of Social Media in governance
 - 9.6.1. Introduction to Social Media
 - 9.6.2. Social Media Platforms
 - 9.6.3. Applications in government organizations
 - 9.6.4. Operating and Managing Social Media
 - 9.7. Use of Video Conference tools (Zoom, Meet, Team, etc.)
- 10. **Cyber Security**
 - 10.1. Introduction to Cyber Security
 - 10.2. Common security threats: Social engineering; Distributed Denial of Services; Malwares: Phishing, Spyware, Viruses, Worms, Trojans, etc.

निजामती कर्मचारी अस्पताल
प्राविधिक सेवा, ईजिनियरिङ एण्ड मेन्टेनेन्स समूह, कम्प्यूटर उपसमूह, कम्प्यूटर टेक्निसियन पद, पाँचौं तहको
खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

- 10.3. Identity and Access Management
- 10.4. Security Engineering: Firewalls, Router/switch security, IDS and IPS, Email Filtering, Vulnerability Scanning, Host based Security tools (use of antivirus software)
- 10.5. Cryptography: Encryption and decryption; Hashing; Digital Signature
- 10.6. Application Security
- 10.7. Business Continuity Planning
- 10.8. Introduction to Security Standards: ISO 27001

11. Software Engineering

- 11.1. Software Development Life Cycle; Software Process Model: Waterfall model, Prototyping model, Incremental model, Spiral model, Agile model, RAD model
- 11.2. Software Project management: Relationship to lifecycle, project planning, project control, project organization, risk management, cost models, configuration management, version control, quality assurance, metrics
- 11.3. Software requirements: Requirements analysis, analysis tools, requirements definition, requirements specification, static and dynamic specifications, requirements review
- 11.4. Software design: Design for reuse, design for change, design evaluation and validation
- 11.5. Implementation: Programming standards and procedures; modularity; Testing: unit testing, integration testing, regression testing, tools for testing
- 11.6. Maintenance: The maintenance problem, the nature of maintenance, planning for maintenance

12. Relevant Legislations and Institutions

- 12.1. ICT Policy, 2072
- 12.2. Electronic Transaction Act, 2063
- 12.3. Information Technology Emergency Response Team (ITERT) Operation and Management Directive, 2075
- 12.4. Government Website Development and Management Directive, 2078
- 12.5. Roles of related Institutions:
 - 12.5.1. Ministry of Communication and Information Technology
 - 12.5.2. Department of Information technology
 - 12.5.3. National Information Technology Center / Government Integrated Data Center
 - 12.5.4. Security Operation/Monitoring Center
- 12.6. General knowledge about Civil Service Hospital and its Bylaws

निजामती कर्मचारी अस्पताल
प्राविधिक सेवा, ईञ्जिनियरिङ एण्ड मेन्टेनेन्स समूह, कम्प्यूटर उपसमूह, कम्प्यूटर टेक्निसियन पद, पाँचौं तहको
खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

प्रयोगात्मक परीक्षामा यथासम्भव निम्नानुसार प्रश्नहरू सोधिनेछ ।

S. No.	Topics	No. of Questions	Marks	Time (Minutes)
1	Devnagari Typing	1	5	5
2	English Typing	1	5	5
3	Hardware maintenance and troubleshooting	1	10	15
4	Operating System	1	5	35
5	Networking	1	5	
6	Word processing	1	5	
7	Electronic Spreadsheet	1	5	
8	Web Technology	1	5	
9	Database Management System	1	5	60
Total		9	50	