

IT Tools & Network Basics (M1-R5.1)

Chapter 1 (Intro to Computer) & Chapter 2 (Operating System) — Master 25 MCQs & 10 Practical Tasks

Module: M1-R5.1

Total MCQs: 25 Questions

Practical Tasks: 10 Tasks

Target Exam: NIELIT O Level
2026

PART 1: 25 HIGH-YIELD OBJECTIVE MCQs (WITH EXPLANATIONS)

1. [Q1 (CPU Architecture)] Which component of the Central Processing Unit (CPU) is responsible for performing mathematical calculations and logical comparisons?

- A. Control Unit (CU)
- B. Arithmetic Logic Unit (ALU)
- C. Register Unit (RU)
- D. Cache Memory

✓ **Correct Answer: B (Arithmetic Logic Unit)**

Explanation: The ALU performs all basic arithmetic operations (+, -, *, /) and logical comparisons (AND, OR, NOT, relational decisions).

2. [Q2 (Primary Memory)] Which of the following computer memories is non-volatile and holds the initial startup instructions (BIOS/bootloader)?

- A. RAM (Random Access Memory)
- B. ROM (Read-Only Memory)
- C. Cache Memory
- D. Virtual Memory

✓ **Correct Answer: B (ROM - Read-Only Memory)**

Explanation: ROM retains its data even after power is turned off and holds BIOS/UEFI firmware needed to bootstrap the system.

3. [Q3 (Memory Hierarchy)] Which memory acts as an ultra-high-speed buffer between the CPU and the main memory (RAM) to speed up data access?

- A. Secondary Storage
- B. Cache Memory
- C. Flash Memory
- D. Virtual Memory

✓ **Correct Answer: B (Cache Memory)**

Explanation: Cache memory (L1, L2, L3) sits closest to the processor core and stores frequently used instructions to prevent CPU idle cycles.

4. [Q4 (Input Devices)] Which input device is widely used to evaluate objective multiple-choice answer sheets by sensing pen/pencil marks?

- A. OCR (Optical Character Recognition)
- B. OMR (Optical Mark Recognition)
- C. MICR (Magnetic Ink Character)
- D. Barcode Reader

✓ **Correct Answer: B (OMR - Optical Mark Recognition)**

Explanation: OMR technology uses light reflection to detect shaded marks on standardized examination sheets.

5. [Q5 (Banking Input)] Which input technology is primarily used by banks to automatically read and process bank cheques using special magnetic ink numbers?

- A. MICR (Magnetic Ink Character Recognition)
- B. OCR
- C. QR Code Scanner
- D. Smart Card Reader

✓ **Correct Answer: A (MICR)**

Explanation: MICR reads numbers printed with magnetic iron-oxide ink along the bottom of cheques for high-speed automated clearing.

6. [Q6 (Memory Units)] How many Bytes are there in 1 Kilobyte (KB) according to standard binary computer memory measurement?

- A. 1000 Bytes
- B. 1024 Bytes
- C. 512 Bytes
- D. 2048 Bytes

✓ **Correct Answer: B (1024 Bytes)**

Explanation: 1 Byte = 8 bits, 1 KB = 1024 Bytes (2^{10} Bytes), 1 MB = 1024 KB, 1 GB = 1024 MB, 1 TB = 1024 GB.

7. [Q7 (Language Translators)] Which language translator program converts the entire high-level source code into machine code in a single pass before execution?

- A. Interpreter
- B. Compiler
- C. Assembler
- D. Linker

✓ **Correct Answer: B (Compiler)**

Explanation: A Compiler translates full high-level source code into executable binary at once, while an Interpreter translates line-by-line.

8. [Q8 (Software Classification)] Which of the following is categorized as System Software rather than Application Software?

- A. Microsoft Word
- B. VLC Media Player
- C. Operating System
- D. Adobe Photoshop

✓ **Correct Answer: C (Operating System)**

Explanation: Operating Systems, device drivers, and utility programs manage system hardware directly and provide a runtime for applications.

9. [Q9 (Open Source Software)] Which of the following is a prominent example of Open Source Software (OSS)?

- A. Microsoft Windows 11
- B. LibreOffice
- C. Adobe Acrobat Reader
- D. Apple macOS

✓ **Correct Answer: B (LibreOffice)**

Explanation: LibreOffice and Linux are free, open-source software with openly published source code under GNU/LGPL licenses.

10. [Q10 (Hardware Concepts)] Standard Keyboard, Mouse, Light Pen, and Touchscreen are classified as which category of devices?

- A. Output Devices
- B. Input Devices
- C. Storage Devices
- D. Processing Units

✓ **Correct Answer: B (Input Devices)**

Explanation: Input devices feed raw data, commands, and user interaction signals into the computer.

11. [Q11 (Computer Generations)] The First Generation of computers (1940s-1950s) utilized which electronic component as their fundamental circuitry technology?

- A. Transistors
- B. Vacuum Tubes
- C. Integrated Circuits (ICs)
- D. Microprocessors

✓ **Correct Answer: B (Vacuum Tubes)**

Explanation: 1st Gen used Vacuum Tubes, 2nd Gen used Transistors, 3rd Gen used ICs, 4th Gen used Microprocessors (VLSI).

12. [Q12 (Storage Hierarchy)] Which of the following displays the exact ascending order of computer data storage units?

- A. Bit < Byte < KB < MB < GB < TB
- B. Byte < Bit < KB < GB < MB < TB
- C. Bit < Byte < MB < KB < TB < GB
- D. KB < MB < Byte < Bit < GB < TB

✓ **Correct Answer: A (Bit < Byte < KB < MB < GB < TB)**

Explanation: Bit is the smallest binary digit (0 or 1), 8 bits = 1 Byte, 1024 Bytes = 1 KB, 1024 KB = 1 MB, 1024 MB = 1 GB, 1024 GB = 1 TB.

13. [Q13 (Secondary Storage)] Which modern storage device utilizes non-volatile flash memory with no spinning disks or moving mechanical parts, offering faster read/write speeds?

- A. Hard Disk Drive (HDD)
- B. Solid State Drive (SSD)
- C. Compact Disc (CD-ROM)
- D. Magnetic Tape

✓ **Correct Answer: B (Solid State Drive - SSD)**

Explanation: SSDs use solid-state NAND flash memory, providing significantly faster speeds, silent operation, and shock resistance compared to HDDs.

14. [Q14 (OS Role & Functions)] What is the primary function and definition of an Operating System (OS)?

- A. To design graphics and spreadsheets
- B. To act as an intermediary interface between user/apps and hardware
- C. To convert AC to DC current
- D. To browse the web exclusively

✓ **Correct Answer: B (Intermediary Interface)**

Explanation: An OS manages computer hardware, processor scheduling, memory allocation, files, and I/O devices while providing common services to users.

15. [Q15 (User Interfaces)] Which user interface style relies on visual elements like windows, icons, menus, and pointers (WIMP) rather than typed text commands?

- A. CLI (Command Line Interface)
- B. GUI (Graphical User Interface)
- C. CUI (Character User Interface)
- D. TUI (Text User Interface)

✓ **Correct Answer: B (GUI - Graphical User Interface)**

Explanation: GUIs enable visual interaction using graphical icons and mouse pointers, making computers user-friendly.

16. [Q16 (Mobile Operating Systems)] The popular mobile operating system Android is built on top of the modified kernel of which operating system?

- A. Microsoft Windows NT
- B. Linux
- C. MS-DOS
- D. FreeBSD

✓ **Correct Answer: B (Linux)**

Explanation: Android is an open-source mobile OS developed by Google, based on a modified version of the Linux kernel.

17. [Q17 (Windows Shortcuts)] In Windows Operating System, which keyboard shortcut combination opens File Explorer directly?

- A. Win + E
- B. Win + D
- C. Win + R
- D. Win + L

✓ **Correct Answer: A (Win + E)**

Explanation: Win+E launches File Explorer. (Win+D minimizes to desktop, Win+R opens Run, Win+L locks the PC).

18. [Q18 (Task Manager)] Which keyboard shortcut combination directly opens the Task Manager in Windows without showing an intermediate menu screen?

- A. Ctrl + Alt + Delete
- B. Ctrl + Shift + Esc
- C. Alt + F4
- D. Alt + Tab

✓ **Correct Answer: B (Ctrl + Shift + Esc)**

Explanation: Ctrl+Shift+Esc directly opens Task Manager without routing to the Windows security options menu.

19. [Q19 (File Extensions)] Which file extension represents the default open-standard document format created by LibreOffice Writer?

- A. .docx
- B. .odt
- C. .xlsx
- D. .pdf

✓ **Correct Answer: B (.odt - OpenDocument Text)**

Explanation: .odt is the default document extension for LibreOffice Writer. (.docx is MS Word, .xlsx is Excel).

20. [Q20 (Print Management)] The background software process in an Operating System that manages and temporarily queues print jobs sent to the printer is known as:

- A. Print Spooler
- B. Task Scheduler
- C. Clipboard Manager
- D. Disk Defragmenter

✓ **Correct Answer: A (Print Spooler)**

Explanation: The Print Spooler manages print jobs sent from applications and buffers them until the physical printer is ready.

21. [Q21 (Linux Commands)] In Linux/Unix command-line interface, which command displays the full absolute path of the current directory you are working in?

- A. cd
- B. pwd
- C. ls
- D. whoami

✓ **Correct Answer: B (pwd - Print Working Directory)**

Explanation: `pwd` outputs the current working directory path (e.g. /home/user/documents).

22. [Q22 (Linux Directory Creation)] Which terminal command is used to create a new folder or directory in Linux/Unix operating systems?

- A. newdir
- B. mkdir
- C. rmdir
- D. touch

✓ **Correct Answer: B (mkdir - Make Directory)**

Explanation: `mkdir` creates new directories in Linux, Unix, and Windows command lines.

23. [Q23 (Desktop GUI)] The prominent horizontal bar usually at the bottom of the Windows desktop that contains the Start button, active task icons, and system notification tray is called:

- A. Title Bar
- B. Taskbar
- C. Status Bar
- D. Ribbon Bar

✓ **Correct Answer: B (Taskbar)**

Explanation: The Taskbar hosts the Start button, running application tabs, search box, and system notification area/clock.

24. [Q24 (Types of OS)] An Operating System built specifically to process external events and sensors within strict, guaranteed real-time deadlines (used in avionics, robotics) is called:

- A. Batch Processing System
- B. Real-Time Operating System (RTOS)
- C. Time-Sharing System
- D. Network OS

✓ **Correct Answer: B (RTOS - Real-Time Operating System)**

Explanation: An RTOS guarantees task execution within precise deadlines, crucial for robotics, medical devices, and aviation.

25. [Q25 (System Configuration)] Which central component in Windows allows users to manage hardware devices, configure date & time, customize display settings, and adjust network connections?

- A. Notepad
- B. Control Panel / Windows Settings
- C. Paint 3D
- D. Recycle Bin

✓ **Correct Answer: B (Control Panel / Windows Settings)**

Explanation: Control Panel and Settings provide management tools for device drivers, user accounts, display resolutions, and network configurations.

PART 2: 10 PRACTICAL TASKS & LAB EXAM SOLUTIONS

Task 1: Directory Hierarchy Creation in Linux CLI

Aim: Create a multi-level directory structure for an IT training center in a single command, navigate into subdirectories, and verify the directory tree.

```
# 1. Create nested directory hierarchy in one command
mkdir -p NIELIT/M1_R5/{Assignments,Practicals,Notes} NIELIT/M2_R5/{HTML,CSS,JS}

# 2. View directory structure recursively
ls -R NIELIT

# 3. Navigate into Practical and verify current path
cd NIELIT/M1_R5/Practicals && pwd
```

Key Takeaways: Tested Concepts: `mkdir -p` (parent directories), `brace expansion {...}`, `cd`, `pwd`, `ls -R`.

Task 2: File Creation, Content Editing & Redirection

Aim: Create two text files containing computer features, write content using `cat` / `echo`, and concatenate them into a single consolidated file.

```
# 1. Create file 1 with echo and output redirection
echo -e 'Computer Features:\n1. High Speed\n2. Accuracy' > part1.txt

# 2. Create file 2 with multi-line cat
cat << 'EOF' > part2.txt
3. Diligence & Versatility
4. Huge Storage Capacity
EOF

# 3. Concatenate/Merge into summary.txt
cat part1.txt part2.txt > computer_summary.txt && cat computer_summary.txt
```

Key Takeaways: Tested Concepts: `echo`, `cat`, `output redirection (>)`, `append (>>)`, `heredoc (<< EOF)`.

Task 3: File Copying, Moving, Renaming & Deletion

Aim: Copy a document to an assignment folder, rename it, make a backup copy, and safely remove the original temporary file.

```
# 1. Copy file to target folder
cp computer_summary.txt NIELIT/M1_R5/Assignments/

# 2. Rename the file inside Assignments to Chapter1_Notes.txt
mv NIELIT/M1_R5/Assignments/computer_summary.txt NIELIT/M1_R5/Assignments/Chapter1_Notes.txt

# 3. Backup and clean up original
mkdir -p Backup && cp NIELIT/M1_R5/Assignments/Chapter1_Notes.txt Backup/
rm computer_summary.txt
```

Key Takeaways: Tested Concepts: `cp` (copy), `mv` (rename/move), `rm` (remove), `directory management`.

Task 4: Hardware & Operating System Specifications Inspection

Aim: Inspect computer CPU architecture, installed RAM, hard disk partitions, and Operating System details using CLI in Linux and Windows.

```
# --- Linux (Terminal) ---
lscpu                # CPU architecture & cores
free -h              # RAM usage (Total, Used, Available)
df -h                 # Disk partition usage
uname -a              # OS Kernel & Architecture

# --- Windows (Command Prompt / Run) ---
msinfo32              # Opens System Information GUI
systeminfo | findstr /C:"OS Name" /C:"Total Physical Memory"
```

Key Takeaways: Tested Concepts: RAM units (GB/MB), CPU models, OS kernel inspection, disk partitions.

Task 5: Linux File Permissions & Access Control (chmod, ls -l)

Aim: Create a shell script, inspect its permissions in long listing format, and assign Read, Write, and Execute permissions using octal notation.

```
# 1. Create a sample script
echo "echo 'NIELIT O Level Practical Lab'" > run_lab.sh

# 2. Check default permissions
ls -l run_lab.sh      # Outputs e.g. -rw-r--r--

# 3. Assign Owner=rwx (7), Group=rx (5), Others=r (4)
chmod 754 run_lab.sh

# 4. Or make directly executable for current user
chmod +x run_lab.sh && ./run_lab.sh
```

Key Takeaways: Tested Concepts: ls -l permission strings, Octal notation (r=4, w=2, x=1), chmod command.

Task 6: Viewing, Filtering & Counting File Contents (head, tail, wc, grep)

Aim: Given a list of computer storage terms, view the first 4 lines, last 3 lines, count total words/lines, and filter matching keywords.

```
# 1. Create list of 10 terms
cat << 'EOF' > memory.txt
RAM (Volatile), ROM (Non-Volatile), Cache Memory, SSD Flash, HDD Magnetic, Tape Drive
EOF

# 2. View top 4 lines & bottom 3 lines
head -n 4 memory.txt && tail -n 3 memory.txt

# 3. Count lines, words & filter keywords
wc memory.txt && grep -i 'Memory' memory.txt
```

Key Takeaways: Tested Concepts: head, tail, wc (word count: lines/words/bytes), grep (case-insensitive filter).

Task 7: File Compression & Archiving (ZIP & TAR)

Aim: Compress a folder of lab documents into .tar.gz and .zip archives, verify the archive, and extract to a destination directory.

```
# 1. Create sample folder with files
mkdir -p LabDocs && echo 'Doc 1' > LabDocs/d1.txt && echo 'Doc 2' > LabDocs/d2.txt

# 2. Create TAR archive (.tar.gz)
tar -czvf LabDocs_Backup.tar.gz LabDocs/

# 3. Create ZIP archive (.zip)
zip -r LabDocs_Backup.zip LabDocs/

# 4. Extract TAR to target directory
mkdir -p Restored && tar -xzf LabDocs_Backup.tar.gz -C Restored/
```

Key Takeaways: Tested Concepts: Archiving (tar -cvf), Compression (gzip/zip), Extraction (tar -xvf/unzip).

Task 8: Process Monitoring & Termination (ps, top, kill)

Aim: Launch a background process, inspect its Process ID (PID) and resource usage, and terminate it gracefully.

```
# 1. Launch a background task (&)
sleep 300 & # Returns PID e.g. [1] 23456

# 2. Search for running process in process table
ps aux | grep 'sleep'

# 3. Open real-time process monitor (press 'q' to quit)
top

# 4. Terminate process using PID
kill 23456 # Or: killall sleep
```

Key Takeaways: Tested Concepts: Background jobs (&), PID inspection, ps aux, top monitor, kill/killall signals.

Task 9: Windows File Attributes via CMD (attrib, dir /a)

Aim: In Windows Command Prompt, set a sensitive document as Hidden and Read-Only, verify attribute protection, and remove the attributes.

```
:: 1. Create a test directory and file
mkdir C:\NIELIT_Lab && cd C:\NIELIT_Lab
echo Confidential Exam Data > secret.txt

:: 2. Set attributes to Hidden (+h) and Read-Only (+r)
attrib +h +r secret.txt

:: 3. Normal dir won't show it; use /a to view hidden files
dir /a

:: 4. Remove attributes
attrib -h -r secret.txt
```

Key Takeaways: Tested Concepts: attrib command (+h, -h, +r, -r), dir /a (hidden files), file write protection.

Task 10: OS GUI Settings, Shortcuts & Printer Queue Management

Aim: Perform essential system setting adjustments, keyboard navigation shortcuts, and printer spooler queue management in Windows GUI.

- Win + E : Opens Windows File Explorer directly.
- Ctrl + Shift + Esc : Directly launches Windows Task Manager.
- Win + R : Opens Run dialog (Type 'control' for Control Panel, 'calc' for Calculator).
- Win + D : Minimizes all open windows to show Desktop.
- Mouse Settings : Settings -> Devices -> Mouse -> Switch primary button / cursor speed.
- Date & Time : Settings -> Time & Language -> Configure 24h/12h format & Time zone.
- Printer Spooler : Run 'control printers' -> Right click Printer -> 'See what\'s printing'.

Key Takeaways: Tested Concepts: Windows shortcut keys, Control Panel, Mouse/Display settings, Print Spooler.

PART 3: QUICK REVISION COMMAND & SHORTCUT CHEAT SHEET

Command / Shortcut	Operating System	Purpose / Function	Example Usage
pwd	Linux CLI	Print current working directory path	pwd
mkdir -p	Linux CLI	Create nested directory structure	mkdir -p A/B/C
ls -l / ls -a	Linux CLI	Long list / show hidden files	ls -la
cat f1 f2 > f3	Linux CLI	Concatenate/Merge multiple files	cat a.txt b.txt > all.txt
chmod 755	Linux CLI	Modify file permissions (rwxr-xr-x)	chmod +x script.sh
head -n / tail -n	Linux CLI	View top / bottom N lines of file	head -n 5 log.txt
grep -i	Linux CLI	Search keyword in files (case insensitive)	grep -i 'RAM' notes.txt
wc -l	Linux CLI	Count total number of lines in a file	wc -l data.txt
tar -czvf	Linux CLI	Create compressed tar.gz archive	tar -czvf bkp.tar.gz dir/
ps aux kill PID	Linux CLI	Inspect active processes & terminate PID	kill 1234
attrib +h +r	Windows CMD	Set file as Hidden and Read-Only	attrib +h +r file.txt
Win + E	Windows GUI	Open File Explorer directly	Shortcut Key
Ctrl + Shift + Esc	Windows GUI	Directly launch Task Manager	Shortcut Key
Win + R	Windows GUI	Open Run Dialog Box	Run 'msinfo32' or 'control'