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FREE EBOOK

COMPUTER AND OFFICE SKILLS

Computer Fundamentals Study Book

The complete study notes, practice questions and glossary for
Computer Fundamentals

INSIDE THIS BOOK

- Introduction to Computers
- Parts of a Computer
- Input and Output Devices
- Memory and Storage Devices
- Bits, Bytes and Number Systems
- ...and 2 more chapters, practice questions and a glossary

Beginner

New computer users, students of class 6 and above, and adults learning for work

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Computer Fundamentals Study Book

Learn how a computer works, from its parts and devices to memory units, number systems, software, operating systems and file management.

WHO IT IS FOR	New computer users, students of class 6 and above, and adults learning for work
LEVEL	Beginner
SUBJECT AREA	Computer and office skills
WHAT IS INSIDE	7 chapters, practice questions with answers, and a glossary

HOW TO USE IT

Read one chapter at a time and try the examples as you go: on a computer, at your workbench or in your notebook. The boxes give tips, safety points and short activities. When you finish, test yourself with the practice questions and check your answers at the end. Words you may not know are explained in the glossary.



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What you will find inside

1	Introduction to Computers	4
2	Parts of a Computer	6
3	Input and Output Devices	8
4	Memory and Storage Devices	10
5	Bits, Bytes and Number Systems	12
6	Software and Operating Systems	15
7	File Management Concepts	17
	Practice questions	19
	Answers	24
	Glossary	26

Introduction to Computers

What a computer does

A computer is an electronic machine that accepts data, processes it according to a set of instructions called a program, stores it, and produces useful results. The data can be numbers, text, pictures, sound or video.

Every task a computer does follows the same basic cycle:

1. **Input:** data enters the computer, for example when Priya types the marks of her classmates into a spreadsheet.
2. **Processing:** the computer works on the data, such as adding the marks and calculating the average.
3. **Output:** the result is shown on the screen or printed on paper, such as a mark sheet.
4. **Storage:** the data and the results are saved so they can be used again later.

Data is raw facts, such as 78, 85 and 91. Information is processed data that has meaning, such as "Class average: 84.67 marks".

Characteristics of a computer

- **Speed:** a modern processor can carry out billions of simple operations every second.
- **Accuracy:** when the data and the program are correct, the result is correct. Most so-called computer errors are really human errors in the data or the instructions. This idea is called GIGO: Garbage In, Garbage Out.
- **Storage:** a computer can store a huge amount of data and find any part of it in seconds.
- **Diligence:** a computer does not get tired or bored. The ten-thousandth calculation is done as carefully as the first.
- **Versatility:** the same computer can be used to type a letter, prepare a GST invoice, edit photos and attend an online class.
- **No judgement of its own:** a computer cannot think or decide like a human being. It only follows instructions. Even artificial intelligence (AI) tools work by following

programs and patterns learned from data; they do not have human understanding or feelings.

Types of computers

Type	Where you see it
Desktop	Offices, computer labs, shop billing counters
Laptop	Portable work and study
Tablet and smartphone	Messages, apps, UPI payments, photos
Server	Runs websites, email and banking systems for many users at once
Supercomputer	Weather forecasting and scientific research, such as India's PARAM series built by C-DAC
Embedded computer	Inside washing machines, ATMs, cars and microwave ovens

Hardware and software

Hardware is every physical part of a computer that you can see and touch: the keyboard, mouse, monitor, printer and the parts inside the cabinet. **Software** is the set of programs that tell the hardware what to do, such as Windows, Microsoft Word or a web browser.

Neither is useful alone. Hardware without software is like a music player with no songs, and software cannot run without hardware. In the coming lessons you will study both in detail.

KEY POINTS

- A computer accepts input, processes it, produces output and stores results.
- Data is raw facts; information is processed data with meaning.
- GIGO means wrong input gives wrong output.
- Hardware is the physical machine; software is the set of programs that run on it.

TRY THESE EXERCISES

1. List ten machines at home or in your neighbourhood that contain a computer, such as an ATM, a washing machine or a smartphone, and write beside each one its type: desktop, laptop, tablet or smartphone, server, supercomputer or embedded computer.
2. Take one everyday job, such as preparing a mark sheet for five classmates, and write in your notebook exactly what happens at each of the four stages: input, processing, output and storage.
3. Make a two-column table headed Hardware and Software and fill it with at least eight items you can see or use on the computer in front of you.

CHAPTER 2

Parts of a Computer

The system unit

On a desktop computer, the main parts are kept inside a metal or plastic box called the cabinet or system unit. Many people in India call the whole cabinet the "CPU", but strictly speaking the CPU is one small chip inside it. In a laptop, all the same parts are packed into the thin body under the keyboard.

The CPU: the brain of the computer

The Central Processing Unit (CPU), also called the processor, carries out the instructions of every program. It has three main parts:

- **Arithmetic Logic Unit (ALU):** does arithmetic such as addition and subtraction, and logical comparisons such as "is 45 greater than 33?".
- **Control Unit (CU):** directs the flow of data and instructions between the CPU, memory and devices, much like a traffic police officer at a busy crossing.
- **Registers:** tiny, very fast storage locations inside the CPU that hold the data being worked on at that moment.

A processor's clock speed is measured in gigahertz (GHz). Modern processors also have several **cores**; a quad-core processor has four cores and can work on several tasks at the same time. Intel and AMD make most desktop and laptop processors, while most phones use ARM-based chips.

Other main parts

- **Motherboard:** the main circuit board. The CPU, memory, storage drives and expansion cards all connect to it.
- **RAM:** the temporary working memory that holds the programs you are using right now.
- **Storage drive:** a hard disk drive (HDD) or solid state drive (SSD) that keeps the operating system, software and your files even when the power is off.
- **Power supply (SMPS):** the switched-mode power supply converts AC mains electricity (230 volts in India) into the low-voltage DC power the parts need.
- **Graphics processor (GPU):** creates the picture on the monitor. It may be built into the processor or fitted as a separate graphics card for gaming, video editing and design work.
- **Cooling:** fans and heat sinks carry heat away. A fan clogged with dust can make a computer slow down or shut itself off.

Ports and connectors

Devices connected outside the cabinet, such as the keyboard and printer, are called **peripherals**. They plug into ports.

Port	Common use
USB (Type-A and Type-C)	Keyboard, mouse, pen drive, printer, phone charging
HDMI	Monitor, TV or projector; carries video and audio
VGA	Older monitors and projectors; video only
Ethernet (RJ-45)	Wired network or internet cable
3.5 mm audio jack	Headphones, speakers, microphone

A UPS (Uninterruptible Power Supply) gives a few minutes of battery power during a power cut, so you can save your work and shut down safely.

KEY POINTS

- The CPU carries out instructions; its parts are the ALU, the Control Unit and registers.
- The motherboard is the main circuit board that connects every part.
- The SMPS converts AC mains power into low-voltage DC.
- Peripherals connect through ports such as USB and HDMI.

TRY THESE EXERCISES

1. Look at the back panel of a desktop cabinet or the sides of a laptop, draw a labelled sketch of every port you can find (USB, HDMI, VGA, Ethernet, audio jack), and write one device that plugs into each.
2. On a Windows computer, open Settings, then System, then About, and note the processor name and the installed RAM; then open Task Manager with Ctrl + Shift + Esc (click More details if it shows only a short list of apps), go to the Performance tab, click CPU and note its base speed in GHz and the number of cores.
3. Write which part of the computer does each of these jobs: does arithmetic and comparisons, directs the flow of data, holds the programs in use, converts AC mains to DC, creates the picture on the monitor, and carries heat away.

CHAPTER 3

Input and Output Devices

Input devices

An input device sends data or commands into the computer.

- **Keyboard:** the most common input device. The standard English layout is called QWERTY after the first six letters of its top letter row. It also has function keys (F1 to F12) and often a numeric keypad.
- **Mouse:** a pointing device. You click, double-click, right-click (to open a shortcut menu), drag and scroll. Laptops also have a built-in touchpad that does the same job.
- **Scanner:** converts printed pages and photographs into digital images.
- **Microphone and webcam:** capture sound and video for online classes and video calls.
- **Barcode reader:** reads the striped codes on products at supermarket billing counters.
- **Biometric scanner:** reads fingerprints, faces or the iris of the eye. It is used for office attendance and for Aadhaar-based identity checks.

- **Joystick and game controller:** used to play games and in some simulators.

Special reading devices: OCR, OMR and MICR

These three are often asked about in examinations, so learn them carefully.

- **OCR (Optical Character Recognition):** software, usually used with a scanner or a phone camera, that reads printed text in an image and turns it into editable text.
- **OMR (Optical Mark Recognition):** reads filled-in bubbles or marks on answer sheets, as used in many competitive examinations and surveys.
- **MICR (Magnetic Ink Character Recognition):** reads the special characters printed in magnetic ink along the bottom of bank cheques, such as the cheque number and the code that identifies the bank branch.

Output devices

An output device shows, prints or plays the results of processing.

- **Monitor:** shows text and pictures. Screen size is measured diagonally in inches, and sharpness depends on resolution, for example 1920 x 1080 pixels (Full HD).
- **Speakers and headphones:** play sound.
- **Projector:** shows the screen on a wall or large screen in classrooms and meetings.
- **Plotter:** prints large drawings such as building plans and engineering designs.

Printers

- **Inkjet printers** spray tiny drops of ink and are popular for colour printing at home.
- **Laser printers** use toner powder and a laser beam; they print text quickly and sharply, so offices prefer them.
- **Dot matrix printers** are impact printers: pins strike an inked ribbon. They are noisy, but are still used for multi-part forms with carbon copies and for printing bank passbooks.

Devices that do both

Some devices work as both input and output devices. A **touchscreen** shows output and also takes your touch as input. A **headset with a microphone** plays sound and records your voice. A **multifunction printer** prints (output) and also scans (input).

Output on the screen is called a soft copy. Output printed on paper is called a hard copy.

KEY POINTS

- Input devices send data in; output devices show, print or play results.
- OCR reads printed text, OMR reads marked bubbles, and MICR reads cheque characters.
- Dot matrix printers are impact printers; inkjet and laser printers are not.
- A touchscreen is both an input and an output device.

TRY THESE EXERCISES

1. Go around your computer lab or home and make a table of every device you find, marking each one as input, output or both; for example, a multifunction printer is both.
2. Use an OCR feature, such as Google Lens on an Android phone or Live Text on an iPhone, to copy the text from a printed page, paste it into a document, and correct any words it read wrongly.
3. Open Settings, then System, then Display, note the screen resolution of your monitor, and compare it with Full HD (1920 x 1080 pixels).

CHAPTER 4

Memory and Storage Devices

Primary memory

Primary memory is the memory the CPU can use directly. It is fast but comparatively small.

- **RAM (Random Access Memory)** is the working memory. When you open a program or a file, it is loaded into RAM. RAM is **volatile**: everything in it is lost when the power goes off. That is why you must save your work. More RAM lets more programs run smoothly at the same time.
- **ROM (Read Only Memory)** is **non-volatile**: its contents stay when the power is off. It holds the firmware that starts the computer. In modern computers this firmware (BIOS or UEFI) is kept on a flash memory chip on the motherboard so that it can be updated.
- **Cache memory** is a small, very fast memory between the CPU and RAM. It keeps copies of data the CPU uses often, so the CPU does not have to wait for RAM. Processors have cache in levels called L1, L2 and L3.

The fastest storage of all is the set of **registers** inside the CPU. As we move from registers to cache, RAM and then storage drives, memory becomes larger and cheaper per gigabyte, but slower.

Secondary storage

Secondary storage keeps data permanently, until you delete it, even with the power off.

- **Hard disk drive (HDD):** stores data magnetically on spinning disks called platters, read by a moving head. It gives large capacity at a low cost, but it is slower than an SSD and can be damaged if dropped while running.
- **Solid state drive (SSD):** stores data on flash memory chips with no moving parts. It starts the computer and opens programs much faster, is silent and uses less power. NVMe SSDs are faster than SATA SSDs.
- **Pen drive and memory card:** small, portable flash storage. Phones and cameras use SD and microSD cards.
- **Optical discs:** read with a laser. A CD holds about 700 MB, a single-layer DVD about 4.7 GB and a single-layer Blu-ray disc about 25 GB. They are less common today.
- **Cloud storage:** your files are kept on a provider's servers on the internet, such as Google Drive, OneDrive or DigiLocker, and you need an internet connection to reach them.

Storage	Technology	Moving parts
HDD	Magnetic	Yes
SSD	Flash memory	No
Pen drive	Flash memory	No
DVD	Optical (laser)	Yes, the disc spins in a drive

Taking care of your data

- Save often with **Ctrl + S**, because RAM forgets everything in a power cut.
- Keep important files in at least two places, for example an external drive and cloud storage. A popular rule is 3-2-1: three copies, on two different kinds of storage, with one copy kept away from home or office.
- Use "Safely Remove" or "Eject" before pulling out a pen drive.
- Scan pen drives from other computers for viruses before opening files.

KEY POINTS

- RAM is volatile working memory; ROM is non-volatile and holds start-up firmware.
- Cache sits between the CPU and RAM to speed up access.
- HDDs store data magnetically; SSDs and pen drives use flash memory.
- Always keep a backup of important files in more than one place.

TRY THESE EXERCISES

1. Open File Explorer with Windows key + E, click This PC, and write down the letter, total size and free space of every drive; then work out roughly what percentage of drive C: is still free.
2. Open Task Manager with Ctrl + Shift + Esc (click More details if it shows only a short list of apps), go to the Performance tab and click Memory to see how much RAM is installed and how much is in use; open three or four apps and watch the in-use figure rise, then close them and watch it fall.
3. Plan a 3-2-1 backup for your own important files: write which three copies you would keep, on which two kinds of storage, and where you would keep the copy that stays away from home.

CHAPTER 5

Bits, Bytes and Number Systems

Why computers use binary

The electronic circuits in a computer have two states: on and off. These are written as 1 and 0. A single binary digit is called a **bit**, the smallest unit of data. Every number, letter, picture and song in a computer is finally stored as a pattern of bits.

Memory units

- 1 **nibble** = 4 bits
- 1 **byte** = 8 bits (enough to store one English letter in ASCII)

Unit	Equal to
1 Kilobyte (KB)	1024 bytes
1 Megabyte (MB)	1024 KB

Unit	Equal to
1 Gigabyte (GB)	1024 MB
1 Terabyte (TB)	1024 GB
1 Petabyte (PB)	1024 TB

Computer courses and Windows count 1 KB as 1024 bytes. Storage makers count 1 KB as 1000 bytes, so a "1 TB" hard disk holds 1,000,000,000,000 bytes and Windows shows it as about 931 GB. Nothing is missing; the two methods simply count differently.

Number systems

System	Base	Digits used
Decimal	10	0 to 9
Binary	2	0 and 1
Octal	8	0 to 7
Hexadecimal	16	0 to 9 and A to F (A = 10, B = 11 ... F = 15)

Binary to decimal

In binary, each place value is a power of 2: 1, 2, 4, 8, 16, 32 and so on, starting from the right. Add the place values wherever there is a 1.

```

Binary:      1   1   0   1
Place value: 8   4   2   1
Total:       8 + 4 + 0 + 1 = 13

```

Decimal to binary

Divide the number by 2 again and again, writing down each remainder. Then read the remainders from bottom to top.

```

13 / 2 = 6   remainder 1
 6 / 2 = 3   remainder 0
 3 / 2 = 1   remainder 1
 1 / 2 = 0   remainder 1
Read upwards: 1101

```

Hexadecimal shortcut

One hexadecimal digit stands for exactly 4 bits, so long binary numbers are easy to write in hex. For example, 1010 is A and 1111 is F, so 1010 1111 is AF in hex, which is 175 in decimal. Web designers use hex colour codes such as #FF0000 for pure red.

Characters are numbers too

Text is stored by giving every character a number. In **ASCII**, capital A is 65, small a is 97 and the digit 0 is 48. ASCII covers only English letters, digits and common symbols, so **Unicode** was created to include the characters of almost every script in the world, including Devanagari. That is how Hindi text can be stored, searched and shared on computers and phones.

KEY POINTS

- 8 bits make a byte and 4 bits make a nibble.
- In the binary convention, each unit (KB, MB, GB, TB) is 1024 times the one before it.
- Binary is base 2, octal base 8, decimal base 10 and hexadecimal base 16.
- 1101 in binary is 13 in decimal; one hex digit equals 4 bits.
- ASCII codes English characters; Unicode covers scripts such as Devanagari.

TRY THESE EXERCISES

1. Convert the decimal numbers 9, 25, 47 and 100 into binary by repeated division by 2, then check each answer by converting it back to decimal using place values.
2. Open the Windows Calculator, choose Programmer from its menu button (the three lines at the top-left), type a decimal number and read its HEX, OCT and BIN values; use it to check the conversions you did by hand.
3. Write your first name in capital letters and work out the ASCII code of each letter, remembering that A is 65 and each following letter is one more (B is 66, C is 67 and so on).

Software and Operating Systems

Types of software

System software runs and manages the computer itself:

- the **operating system**, such as Windows;
- **device drivers**, small programs that let the operating system control a device such as a printer or webcam;
- **utility programs**, such as antivirus, disk cleanup, backup and file compression tools.

Application software helps the user do a particular job: Microsoft Word for documents, Excel for calculations, TallyPrime for accounts, a web browser for the internet, or a UPI app for payments.

Programming software helps people write programs. Programs written in high-level languages must be translated into machine code:

- a **compiler** translates the whole program before it runs (C and C++ are usually compiled);
- an **interpreter** translates and runs the program one statement at a time (Python is usually run by an interpreter);
- an **assembler** converts assembly language into machine code.

Software licences

- **Proprietary software** belongs to a company, which sells a licence or subscription and keeps the source code private. Examples: Windows, Microsoft 365, TallyPrime.
- **Open-source software** shares its source code so that anyone can study, change and share it. Examples: Linux, LibreOffice, Mozilla Firefox.
- **Freeware** is free to use, but its source code is not shared, for example Adobe Acrobat Reader.
- **Shareware or trial software** can be used free for a limited period or with limited features.

Pirated or "cracked" software is illegal to use and often hides viruses or other malware.

What an operating system does

The operating system (OS) is the most important system software. It manages the hardware and gives other programs a platform to run on. Its main functions are:

1. **Process management:** decides which program uses the CPU and when, so that many programs can run together (multitasking).
2. **Memory management:** gives each program its share of RAM and takes it back when the program closes.
3. **File management:** organises files and folders on drives.
4. **Device management:** controls devices through their drivers.
5. **Security:** protects the computer with user accounts, passwords and permissions.
6. **User interface:** lets you give commands, either through a GUI (graphical user interface with windows, icons and a mouse) or a CLI (command-line interface, where you type commands, as in Command Prompt or a Linux terminal).

Common operating systems include Windows, macOS and Linux (for example Ubuntu) on computers, and Android and iOS on phones.

How a computer starts

When you press the power button, the firmware (BIOS or UEFI) runs a quick check of the hardware called **POST** (Power-On Self-Test). It then finds the boot loader on the storage drive, which loads the operating system into RAM, and the login screen appears. Starting a computer from the off state is a **cold boot**; restarting it while it is on is a **warm boot**. Always shut down from the Start menu instead of switching off the power directly.

KEY POINTS

- System software runs the computer; application software does tasks for the user.
- A compiler translates the whole program first; an interpreter works one statement at a time.
- Open-source software shares its source code; proprietary software does not.
- The OS manages processes, memory, files, devices, security and the user interface.
- POST is the hardware check the firmware runs at start-up.

TRY THESE EXERCISES

1. Open the Start menu, look through the full list of installed apps, and sort ten of them into system software (including utilities) and application software in a two-column table.
2. Open Settings, then System, then About, and write down the edition and version of Windows installed; then name one open-source program you could use instead of a proprietary office suite and one open-source web browser.
3. Hold the Shift key while you click Shut down in the Start menu, so that Windows shuts down fully instead of using Fast Startup; switch the computer on again (a cold boot) and note in order what appears until the sign-in screen, such as a maker's or Windows logo, spinning dots and the lock screen, then match each stage as best you can to POST, the boot loader and the operating system loading.

CHAPTER 7

File Management Concepts

Files and folders

A **file** is a named collection of related data stored on a drive, such as a letter, a photo, a song or a program. A **folder** (also called a directory) is a container that holds files and other folders. A folder inside another folder is a **subfolder**. Together they form a tree-like structure that starts at the top level of a drive, called the **root**.

File names and extensions

A file name has two parts: the name and the **extension**, which comes after the last full stop. In `GST-Invoice-April.pdf`, the name is "GST-Invoice-April" and the extension is ".pdf". The extension tells the operating system what type of file it is and which program should open it.

Extension	File type	Usually opened with
.docx	Word document	Microsoft Word
.xlsx	Excel workbook	Microsoft Excel
.pptx	PowerPoint presentation	Microsoft PowerPoint
.pdf	Portable Document Format	A PDF reader or web browser

Extension	File type	Usually opened with
.txt	Plain text	Notepad
.jpg, .png	Pictures	Photos app
.mp3, .mp4	Audio, video	Media player
.zip	Compressed folder	File Explorer
.exe	Program	Windows runs it directly

Naming rules in Windows

A Windows file name cannot contain these nine characters: \ / : * ? " < > |

Spaces, hyphens and underscores are allowed. Choose names that describe the content. Writing dates as year-month-day, such as "2026-04-15 Rent Receipt.pdf", makes files sort in date order automatically.

Drives and paths

Windows gives each drive a letter. The drive where Windows is installed is usually C:, and other drives such as a second partition, a DVD drive or a pen drive get letters like D: and E:. The **path** of a file is its complete address, listing every folder from the drive down to the file:

```
C:\Users\Aman\Documents\Accounts\GST-Invoice-April.pdf
```

Windows separates folders in a path with a backslash. Web addresses, Linux and macOS use a forward slash instead.

Common file operations

- **Create and save:** "Save" stores changes in the same file; "Save As" creates a new copy with a new name or location.
- **Rename:** change the name without changing the content.
- **Copy:** makes a duplicate; the original stays where it was.
- **Move (cut):** transfers the file to a new location; the original location no longer has it.
- **Delete and restore:** files deleted normally from the computer's own drive go to the Recycle Bin and can be restored from there until it is emptied.
- **Compress:** a zip file packs many files into one file, usually smaller, that is easier to email or upload.

Every file also has **properties**, such as its size, type, the date it was created and modified, and attributes like read-only (cannot be changed) and hidden (not shown normally).

Make one folder for each subject, client or year, and keep everything in it. A good folder plan saves a lot of searching later.

KEY POINTS

- A file holds data; a folder holds files and other folders.
- The extension after the last full stop tells the file type.
- A path is the full address of a file or folder, such as C:\Users\Aman\Documents.
- Copy keeps the original; move takes it away from the old location.

TRY THESE EXERCISES

1. In your Documents folder, create a folder for this course with a subfolder for each subject, such as Fundamentals, Word and Excel; open one subfolder, click an empty part of the address bar to see its full path, and copy that path into your notebook.
2. Create a text file in Notepad and save it with a date-first name such as 2026-04-15 Practice Notes.txt; then rename it, copy it to a second folder, move that copy to a third folder, delete the moved copy, and restore it from the Recycle Bin.
3. While renaming a practice file, try to type a question mark or a colon in its name and write down the message Windows shows; then list from memory the nine characters a Windows file name cannot contain.

CHECK YOURSELF

Practice questions

Choose the best answer for each question. The answers, with a short explanation, are in the next chapter.

1. What is the correct order of the basic steps a computer follows to complete a task?

- | | |
|------------------------------|------------------------------|
| a) Output, input, processing | b) Input, processing, output |
| c) Processing, input, output | d) Input, output, processing |

2. What does the term GIGO mean?

- a) A computer can correct wrong data on its own
- b) The computer works faster when it has more storage
- c) If the input data is wrong, the output will also be wrong
- d) Output must always be printed on paper

3. Which of the following is information rather than raw data?

- a) Class average: 84.67 marks
- b) 78
- c) 85, 91, 78
- d) Priya

4. Which type of computer is built into devices such as washing machines, ATMs and microwave ovens?

- a) Supercomputer
- b) Server
- c) Laptop
- d) Embedded computer

5. Which characteristic of a computer means it does not get tired or lose concentration, even after doing the same work many times?

- a) Diligence
- b) Versatility
- c) Speed
- d) Storage

6. Which part of the CPU performs arithmetic and logical operations?

- a) Arithmetic Logic Unit (ALU)
- b) Control Unit (CU)
- c) Motherboard
- d) SMPS

7. What is the main job of the Control Unit (CU) in a CPU?

- a) It stores files permanently when the power is off
- b) It converts AC mains power into DC power
- c) It directs and coordinates the flow of data and instructions
- d) It displays the output on the monitor

8. What does the SMPS in a desktop computer do?

- a) It converts AC mains electricity into the low-voltage DC power the parts need
- b) It stores data while the computer is switched off
- c) It connects the computer to the internet
- d) It translates programs into machine code

9. What is the main circuit board of a computer, to which the CPU, RAM and storage drives connect, called?

- a) Graphics card
- b) Hard disk
- c) Heat sink
- d) Motherboard

- 10. Which port is commonly used to connect a monitor or TV and carries both video and audio?**
- a) VGA
 - b) Ethernet (RJ-45)
 - c) HDMI
 - d) 3.5 mm audio jack
- 11. Which device reads the special characters printed in magnetic ink at the bottom of bank cheques?**
- a) OMR reader
 - b) MICR reader
 - c) Barcode reader
 - d) Plotter
- 12. Which technology is used to read filled-in bubbles on examination answer sheets?**
- a) OCR
 - b) MICR
 - c) OMR
 - d) GPU
- 13. Which type of printer is an impact printer that is still used for multi-part carbon forms and bank passbooks?**
- a) Laser printer
 - b) Inkjet printer
 - c) Thermal printer
 - d) Dot matrix printer
- 14. Which of these devices works as both an input and an output device?**
- a) Scanner
 - b) Speaker
 - c) Touchscreen
 - d) Projector
- 15. What does OCR software do?**
- a) It reads magnetic ink characters on cheques
 - b) It reads marks on answer sheets
 - c) It prints large engineering drawings
 - d) It converts printed text in a scanned image into editable text
- 16. Which memory loses its contents when the computer is switched off?**
- a) ROM
 - b) SSD
 - c) Hard disk
 - d) RAM
- 17. Which type of memory is non-volatile and holds the start-up firmware of a computer?**
- a) RAM
 - b) ROM
 - c) Cache
 - d) Registers

18. Why does a CPU use cache memory?

- a) To keep frequently used data close to the CPU for faster access
- b) To store files permanently when the power is off
- c) To increase the size of the hard disk
- d) To connect the computer to a network

19. Which statement about a solid state drive (SSD) is correct?

- a) It stores data on flash memory chips and has no moving parts
- b) It stores data on spinning magnetic platters
- c) It loses all its data when the computer is switched off
- d) It can be read but never written to

20. About how much data can a single-layer DVD hold?

- a) About 4.7 GB
- b) About 700 MB
- c) About 25 GB
- d) About 1.44 MB

21. How many bits make one byte?

- a) 4
- b) 16
- c) 8
- d) 1024

22. In the binary convention used in computer courses and by Windows, 1 KB is equal to how much?

- a) 1024 bits
- b) 1024 bytes
- c) 1000 bits
- d) 512 bytes

23. What is the binary number 1101 in decimal?

- a) 11
- b) 13
- c) 15
- d) 9

24. What is the decimal number 10 written in binary?

- a) 1100
- b) 1001
- c) 0110
- d) 1010

25. What decimal value does the hexadecimal digit F stand for?

- a) 15
- b) 16
- c) 14
- d) 10

26. What is a group of 4 bits called?

- a) Byte
- b) Kilobit
- c) Word
- d) Nibble

27. Which of these is an example of system software?

- a) A word processor
- b) A spreadsheet program
- c) A printer device driver
- d) A video game

28. How does a compiler differ from an interpreter?

- a) A compiler runs programs one line at a time, while an interpreter translates the whole program first
- b) A compiler translates the whole program before it runs, while an interpreter works one statement at a time
- c) A compiler is hardware, while an interpreter is software
- d) A compiler can only translate assembly language

29. Which of these is open-source software?

- a) Microsoft Word
- b) LibreOffice
- c) TallyPrime
- d) Windows 11

30. What is POST, which runs when a computer is switched on?

- a) A quick hardware check run by the firmware before the operating system loads
- b) A program that sends email
- c) The process of shutting down the computer safely
- d) A type of printer port

31. Which of these is an example of a command-line interface?

- a) File Explorer
- b) The Start menu
- c) Command Prompt
- d) Desktop icons

32. In the file name Report-March.docx, what is ".docx"?

- a) The folder name
- b) The file extension
- c) The drive letter
- d) The file path

33. Which of these characters is not allowed in a Windows file name?

- a) Hyphen (-)
- b) Underscore (_)
- c) Space
- d) Question mark (?)

34. What is the difference between copying and moving a file?

- a) Copying deletes the original; moving keeps it
- b) Copying works only on pen drives; moving works only on hard disks
- c) Copying leaves the original in place and makes a duplicate; moving takes the file away from its old location
- d) There is no difference between them

35. Which file extension is used for a compressed archive that can hold many files in one?

- a) .exe
- c) .txt

- b) .zip
- d) .png

ANSWER KEY

Answers

1. **(b) Input, processing, output.** Data is first entered (input), then worked on (processing), and finally the result is shown or printed (output). Storage keeps the data and results for later use.
2. **(c) If the input data is wrong, the output will also be wrong.** GIGO stands for Garbage In, Garbage Out. A computer processes exactly what it is given, so incorrect input leads to incorrect results.
3. **(a) Class average: 84.67 marks.**
Information is data that has been processed and given meaning. The class average is the result of processing the individual marks, which are raw data.
4. **(d) Embedded computer.** An embedded computer is a small computer built inside another device to control it, such as the controller in a washing machine.
5. **(a) Diligence.** Diligence means the computer works with the same care on the ten-thousandth task as on the first. Versatility means it can do many different kinds of work.
6. **(a) Arithmetic Logic Unit (ALU).** The ALU carries out calculations such as addition and comparisons such as greater than or equal to. The Control Unit directs the work but does not calculate.
7. **(c) It directs and coordinates the flow of data and instructions.** The Control Unit manages the movement of data and instructions between the CPU, memory and devices, telling each part what to do and when.
8. **(a) It converts AC mains electricity into the low-voltage DC power the parts need.**
The switched-mode power supply (SMPS) changes AC mains power into the steady low-voltage DC power used by the motherboard, drives and other parts.
9. **(d) Motherboard.** The motherboard is the main circuit board. Every other internal part connects to it, directly or through cables.
10. **(c) HDMI.** HDMI carries both picture and sound over one cable. VGA carries video only, and Ethernet is used for network connections.
11. **(b) MICR reader.** MICR stands for Magnetic Ink Character Recognition. Banks use it to read the cheque number and branch code printed in magnetic ink.

- 12. (c) OMR.** Optical Mark Recognition (OMR) detects the marks or filled bubbles on specially printed sheets, as used in many competitive examinations.
- 13. (d) Dot matrix printer.** A dot matrix printer prints by striking pins against an inked ribbon, so the impact can also mark carbon copies. Laser, inkjet and thermal printers do not strike the paper.
- 14. (c) Touchscreen.** A touchscreen displays output and also accepts touch input. A scanner is input only, while speakers and projectors are output only.
- 15. (d) It converts printed text in a scanned image into editable text.** Optical Character Recognition (OCR) recognises the letters in an image of a printed page and turns them into text that can be edited.
- 16. (d) RAM.** RAM is volatile memory, so its contents disappear without power. ROM, SSDs and hard disks are non-volatile and keep their data.
- 17. (b) ROM.** ROM keeps its contents without power and holds the firmware (BIOS or UEFI) that starts the computer. RAM, cache and registers are all volatile.
- 18. (a) To keep frequently used data close to the CPU for faster access.** Cache is a small, very fast memory between the CPU and RAM. Keeping often-used data there saves the CPU from waiting for slower RAM.
- 19. (a) It stores data on flash memory chips and has no moving parts.** An SSD uses flash memory, so it has no moving parts and is much faster than a hard disk. Spinning magnetic platters are found in an HDD.
- 20. (a) About 4.7 GB.** A single-layer DVD holds about 4.7 GB. A CD holds about 700 MB and a single-layer Blu-ray disc about 25 GB.
- 21. (c) 8.** One byte is a group of 8 bits. A group of 4 bits is called a nibble.
- 22. (b) 1024 bytes.** In the binary convention each unit is 1024 times the previous one, so 1 KB is 1024 bytes. Storage makers often use 1000 bytes instead.
- 23. (b) 13.** The place values are 8, 4, 2 and 1, so 1101 is $8 + 4 + 0 + 1 = 13$.
- 24. (d) 1010.** 10 is $8 + 2$, so the binary digits are 1 (8), 0 (4), 1 (2) and 0 (1), giving 1010.
- 25. (a) 15.** Hexadecimal uses A to F for the values 10 to 15, so F stands for 15.
- 26. (d) Nibble.** A nibble is 4 bits, which is half of a byte. One hexadecimal digit represents exactly one nibble.
- 27. (c) A printer device driver.** A device driver lets the operating system control a piece of hardware, so it is system software. Word processors, spreadsheets and games are application software.
- 28. (b) A compiler translates the whole program before it runs, while an interpreter works one statement at a time.** A compiler converts the complete program into machine code before execution. An interpreter translates and runs each statement in turn.
- 29. (b) LibreOffice.** LibreOffice publishes its source code for anyone to study and change. Microsoft Word, TallyPrime and Windows are proprietary.

30. (a) **A quick hardware check run by the firmware before the operating system loads.** POST stands for Power-On Self-Test. The BIOS or UEFI firmware checks the main hardware before loading the operating system.
31. (c) **Command Prompt.** In Command Prompt you type commands as text. File Explorer, the Start menu and desktop icons are parts of the graphical user interface.
32. (b) **The file extension.** The extension is the part after the last full stop. It tells Windows that the file is a Word document.
33. (d) **Question mark (?).** Windows does not allow the characters \ / : * ? " < > | in file names. Hyphens, underscores and spaces are allowed.
34. (c) **Copying leaves the original in place and makes a duplicate; moving takes the file away from its old location.** A copy creates a second identical file while the original stays. A move transfers the file, so it no longer exists in the old place.
35. (b) **.zip.** A zip file packs one or more files into a single, usually smaller file. Windows can open and extract zip files without extra software.

WORD LIST

Glossary

ALU

The Arithmetic Logic Unit, the part of the CPU that does arithmetic such as addition and logical comparisons such as checking whether one number is greater than another.

ASCII

American Standard Code for Information Interchange, a character code that gives each English letter, digit and common symbol a number from 0 to 127, such as 65 for capital A and 97 for small a.

Binary

The base-2 number system, which uses only the digits 0 and 1 and is how computers store all data.

BIOS and UEFI

The Basic Input/Output System and its modern replacement, the Unified Extensible Firmware Interface: firmware kept on a chip on the motherboard that checks the hardware and starts loading the operating system when the computer is switched on.

Bit

The smallest unit of data, a single binary digit that is either 0 or 1.

Byte

A group of 8 bits, enough to store one English character in ASCII.

Cache memory

A small, very fast memory between the CPU and RAM that keeps copies of the data the CPU uses most often.

Compiler

A program that translates a whole program written in a high-level language such as C into machine code before it runs.

CPU

The Central Processing Unit, or processor, the chip that carries out the instructions of every program.

File extension

The letters after the last full stop in a file name, such as pdf or docx, which tell the operating system what type of file it is.

GIGO

Short for Garbage In, Garbage Out, the idea that wrong input data or wrong instructions give wrong results.

Hardware

All the physical parts of a computer that you can see and touch, such as the keyboard, monitor and motherboard.

Hexadecimal

The base-16 number system, which uses the digits 0 to 9 and the letters A to F, where one digit stands for exactly 4 bits.

Interpreter

A program that translates and runs a program one statement at a time instead of translating the whole program first.

Motherboard

The main circuit board of a computer, to which the CPU, memory, storage drives and expansion cards all connect.

OCR

Optical Character Recognition, software that reads printed text in a scanned image or photo and turns it into editable text.

Open-source software

Software whose source code is shared so that anyone can study, change and share it, such as Linux, LibreOffice and Mozilla Firefox.

Operating system

The main system software, such as Windows, macOS, Linux or Android, that manages the hardware and gives other programs a platform to run on.

Path

The complete address of a file or folder, listing every folder from the drive down to it, such as C:\Users\Aman\Documents.

POST

The Power-On Self-Test, a quick check of the hardware that the firmware runs every time the computer starts.

RAM

Random Access Memory, the volatile working memory that holds the programs and files in use and loses its contents when the power goes off.

ROM

Read Only Memory, non-volatile memory whose contents stay when the power is off and which holds the start-up firmware.

Software

The programs that tell the hardware what to do, such as Windows, Microsoft Word or a web browser.

SSD

A solid state drive, a storage device that keeps data on flash memory chips with no moving parts and works much faster than a hard disk drive.

Unicode

The international character-coding standard that covers the characters of almost every script in the world, including Devanagari.



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