ZAHID NOTES • KHYBER PAKHTUNKHWA

9th Class Computer Science Notes Khyber Pakhtunkhwa (KPK) Full Book Notes

Complete chapter-wise study notes, key terms and original practice questions for Class 9 Computer Science.

About these notes

These notes follow the six chapters of the Khyber Pakhtunkhwa Textbook Board book *A Textbook of Computer Science for Grade IX*:
1. Fundamentals of Computer • 2. Fundamentals of Operating System • 3. Office Automation • 4. Data Communication • 5. Computer Networks • 6. Computer Security and Ethics.

Each chapter contains study notes, key terms, and original practice questions (multiple-choice, short and long questions) written for these notes, with an MCQ answer key at the end of the book.

About the KPK paper (third-party reproduction, not officially confirmed): The BISE Peshawar Class 9 Computer Science theory paper (2025) was 55 marks in 2 hours 30 minutes — Section A: 11 multiple-choice questions (11 marks); Section B: 9 short questions, attempt any 7, 4 marks each (28 marks); Section C: 3 long questions, attempt any 2, 8 marks each (16 marks). A practical examination also exists (practical notebook work in Chapters 1, 2, 4 and 5); its marks are not printed here because they could not be confirmed from an official KPK source. Please check the current model paper on your own board's official website (for example bisep.edu.pk for Peshawar) before your examination.

For students of the Boards of Intermediate and Secondary Education of Khyber Pakhtunkhwa — Peshawar, Mardan, Swat, Abbottabad, Bannu, Kohat, Malakand and D.I. Khan. The book is English-medium.

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End MCQ Answer Key (all chapters)

How to use these notes

- Read the study notes of one chapter first, and learn the key terms at the end of the chapter.
- Then try the practice questions without looking at the notes. Check your MCQs against the answer key at the end.
- For short and long questions, write full answers in your own words — that is how you will answer in the examination.
- Practise the office tools (word processor, spreadsheet, Inpage) on a real computer. The practical examination tests what you can do, not only what you can write.

Chapter weightage (National Curriculum, 2009)

The curriculum weightage for Class 9 Computer Science is: Chapter 1 — 15%, Chapter 2 — 15%, Chapter 3 — 25%, Chapter 4 — 20%, Chapter 5 — 15%, Chapter 6 — 10%. Office Automation (Chapter 3) carries the most weight, so give it extra revision time.

Note: All practice questions in this book are original questions written for these notes. They are practice material, not past papers, and no question in this book is presented as an official board question.

Chapter 1: Fundamentals of Computer

A computer is an electronic machine that accepts data, processes it according to instructions, stores the results and gives useful output. This chapter explains what a computer is, how it works, the parts it is made of, and the programs that make it useful.

1.1 What is a computer?

- A computer is an electronic device that takes input (data), processes it, stores it and produces output (information).
- Data means raw facts and figures, such as numbers and names. Information is data that has been processed into a useful form, such as a result or a report.
- A computer works very fast, works accurately, can store large amounts of data, and can do the same work again and again without getting tired.
- Computers are used in schools, offices, hospitals, banks, shops and homes — for learning, keeping records, communication and entertainment.

1.2 Basic operations of a computer

- Every computer follows the input–process–output cycle: it takes input, processes it, and gives output. Storage keeps data and programs for later use.
- Input devices send data into the computer: keyboard, mouse, scanner, microphone and camera.
- Processing is done by the Central Processing Unit (CPU). The CPU has a Control Unit (CU), which directs all operations, and an Arithmetic Logic Unit (ALU), which does calculations and logical comparisons.
- Output devices present results to the user: monitor, printer and speakers. Storage devices — hard disk, SSD and USB drive — keep data for a long time.

1.3 Computer hardware

- Hardware is the physical part of a computer — everything you can touch, such as the keyboard, monitor, processor, memory and storage devices.
- The motherboard is the main circuit board inside the computer. The processor, memory and other parts are connected to it.
- Ports are connection points on the computer where devices such as a mouse, keyboard, printer or USB drive are attached.
- Expansion slots are places on the motherboard where extra cards can be fitted. Expansion cards — such as a graphics card, sound card or network card — add new abilities to the computer.

1.4 Computer software

- Software is the set of programs and instructions that tells the hardware what to do. Without software, hardware cannot do any useful work.
- System software manages the hardware and provides a platform for other programs. The operating system is the main example.
- Application software helps the user do a task — word processing, spreadsheets, web browsing and drawing programs are examples.
- Open source software can be used and changed freely, and its source code is available to everyone. Shareware can be tried free for a short time and then must be paid for. Freeware is free to use but its source code is not shared.

1.5 Types of computers

- Microcomputers are small computers for one user at a time — desktop computers, laptops, tablets and smartphones.
- Minicomputers are medium-sized computers used by small organisations to serve many users at once.
- Mainframe computers are large, powerful machines used by banks, airlines and large organisations to process huge amounts of data.
- Supercomputers are the fastest and most powerful computers. They are used for weather forecasting, scientific research and other very large calculations.

Key terms

- CPU — Central Processing Unit. CU — Control Unit. ALU — Arithmetic Logic Unit.
- RAM — Random Access Memory (temporary). ROM — Read Only Memory (permanent start-up instructions).
- Hardware — physical parts of a computer. Software — programs and instructions. Data — raw facts. Information — processed, useful data.
- Port — a connection point for devices. Expansion card — a card fitted into an expansion slot to add a new ability.

Chapter 1: Fundamentals of Computer — Practice Questions

Multiple-Choice Questions

Q1. What is the main function of the Control Unit?

(A) To do calculations (B) To direct all operations of the computer (C) To store data permanently (D) To print results

Q2. Which of these is an input device?

(A) Printer (B) Monitor (C) Scanner (D) Speaker

Q3. Data that has been processed into a useful form is called:

(A) software (B) hardware (C) information (D) memory

Q4. Which memory loses its contents when the power is switched off?

(A) ROM (B) Hard disk (C) RAM (D) USB drive

Q5. An expansion card is fitted into:

(A) a port (B) an expansion slot (C) the monitor (D) the keyboard

Q6. Which of these is system software?

(A) Spreadsheet (B) Web browser (C) Operating system (D) Word processor

Q7. Freeware is software that is:

(A) free to use (B) sold only in shops (C) never updated (D) written in Urdu

Q8. Which computer is used for weather forecasting?

(A) Microcomputer (B) Minicomputer (C) Mainframe computer (D) Supercomputer

Q9. The ALU performs:

(A) printing (B) calculations and logical comparisons (C) storing data (D) controlling devices

Q10. Which device gives output in printed form?

(A) Keyboard (B) Mouse (C) Printer (D) Scanner

Short Questions

Q1. Define a computer.

Q2. What is the difference between data and information?

Q3. State the functions of the Control Unit and the Arithmetic Logic Unit.

Q4. What is an expansion slot? Give one example of an expansion card.

Q5. What is the difference between shareware and freeware?

Long Questions

Q1. Explain the input–process–output cycle of a computer with an example from everyday life.

Q2. Describe the main types of computers (micro, mini, mainframe and supercomputer) and give one use of each.

> Write each answer in your own words, in full sentences. For long questions, give an introduction, the main points with examples, and a short conclusion.

Chapter 2: Fundamentals of Operating System

An operating system is the most important program in a computer. It manages the hardware, runs other programs, and gives the user a way to control the computer. This chapter explains what an operating system does, its types, and how to use and install one.

2.1 Introduction to the operating system

- An operating system (OS) is system software that manages the computer hardware and provides services for other programs.
- The operating system starts working as soon as the computer is switched on and keeps running until it is switched off.
- The main objective of an operating system is to make the computer easy to use and to use its resources — processor, memory and devices — efficiently.
- Without an operating system, the user would have to control every part of the hardware directly, which would be very difficult.

2.2 Functions of the operating system

- Processor management: the operating system decides which program uses the processor and for how long.
- Memory management: it gives memory to programs while they run and takes it back when they finish.
- File management: it organises data into files and folders, and keeps track of where each file is stored.
- Device management: it controls input and output devices through small programs called drivers. It also provides the user interface and protects the computer from unauthorised access.

2.3 Common types of operating system

- A single-user operating system allows only one user at a time, such as Windows on a home computer.
- A multi-user operating system allows many users to work at the same time, such as a system on a large office server.
- A single-tasking operating system runs one program at a time; a multi-tasking operating system runs several programs at the same time.
- Other types include batch operating systems, real-time operating systems (used in machines that must respond instantly), network operating systems and distributed operating systems.

2.4 Classification and examples

- Operating systems are classified by the number of users, the number of tasks, and the way they are used.
- Desktop and laptop operating systems include Microsoft Windows, macOS and Linux.
- Mobile operating systems include Android and iOS, used on smartphones and tablets.
- Each operating system has its own look and its own programs, but all of them do the same basic jobs: manage hardware, run programs and help the user.

2.5 Getting started with a GUI operating system

- A Graphical User Interface (GUI) lets the user control the computer with windows, icons, menus and a mouse pointer instead of typed commands.
- The desktop is the main screen. It shows icons — small pictures that stand for programs, files and folders.
- A file is a collection of stored data, such as a document or a picture. A folder is a container that holds files and other folders.
- Files and folders can be created, renamed, copied, moved and deleted. Keeping them in named folders makes data easy to find.

2.6 System installation

- Installing an operating system means copying its files onto the computer and setting it up for use, for example installing Windows 10.
- Before installation, important data should be saved (backed up), because installation can erase the disk.
- After installation, device drivers are installed so that the printer, sound and display work correctly.
- An antivirus program should be installed and kept updated. Windows Defender is the built-in antivirus and security program of Windows 10.

Key terms

- Operating system — system software that manages hardware and runs other programs. GUI — Graphical User Interface.
- Driver — a small program that lets the operating system control a device. File — stored data. Folder — a container for files.
- Multi-tasking — running several programs at the same time. Multi-user — many users working at the same time.
- Windows Defender — the built-in antivirus and security program of Windows 10.

Chapter 2: Fundamentals of Operating System — Practice Questions

Multiple-Choice Questions

Q1. The operating system is an example of:

(A) application software (B) system software (C) freeware (D) hardware

Q2. Which function gives memory to a running program?

(A) File management (B) Memory management (C) Device management (D) Printing

Q3. An operating system that allows many users at the same time is called:

(A) single-user (B) multi-user (C) single-tasking (D) real-time

Q4. Which of these is a mobile operating system?

(A) Windows (B) Linux (C) Android (D) macOS

Q5. In a GUI, a small picture that stands for a program is called:

(A) a driver (B) an icon (C) a folder (D) a window

Q6. A folder is used to:

(A) print documents (B) hold files and other folders (C) run the processor (D) store power

Q7. A driver is a program that:

(A) lets the operating system control a device (B) deletes all files (C) draws pictures (D) connects to the internet

Q8. Windows Defender is:

(A) a word processor (B) the built-in antivirus of Windows 10 (C) a web browser (D) a spreadsheet

Q9. Multi-tasking means:

(A) one user only (B) several programs running at the same time (C) one program only (D) no programs running

Q10. Before installing an operating system, important data should be:

(A) deleted (B) backed up (C) printed (D) hidden

Short Questions

Q1. Define an operating system.

Q2. State two objectives of an operating system.

Q3. What is the difference between single-user and multi-user operating systems?

Q4. What is a GUI? Give two examples of GUI elements.

Q5. What is Windows Defender?

Long Questions

Q1. Explain any four functions of an operating system, with a short example of each.

Q2. Describe the types of operating systems and give one example of each type.

> Write each answer in your own words, in full sentences. For long questions, give an introduction, the main points with examples, and a short conclusion.

Chapter 3: Office Automation

Office automation means using computer programs to do office work — writing letters, keeping records, making tables and preparing presentations — quickly and neatly. This chapter explains the main office tools: the word processor, the spreadsheet, the Urdu editor Inpage, and presentation software.

3.1 What is office automation?

- Office automation is the use of computer software to do routine office work faster, more accurately and with less paper.
- An office automation package usually contains a word processor, a spreadsheet program, a presentation program and a database program.
- Office automation saves time, reduces mistakes, makes documents easy to change and share, and keeps records in one place.
- It is used in schools, offices, banks and government departments for letters, reports, results, accounts and presentations.

3.2 Word processor

- A word processor is a program for creating and editing documents, such as letters, applications and reports. Microsoft Word is a common example.
- To manage a document means to create it, open it, save it, print it and close it. Documents are saved as files so they can be opened again later.
- Text can be inserted, deleted, copied, moved and edited. The ribbon gives commands for formatting text, paragraphs and pages.
- Formatting includes changing the font, size and colour of text, making it bold or italic, and aligning paragraphs. Tables, pictures, WordArt, page breaks, section breaks and hyperlinks can be inserted, and page margins can be changed.

3.3 Spreadsheets

- A spreadsheet is a program that organises data in rows and columns. The place where a row and a column meet is called a cell.
- Each cell has an address, such as A1 or C5, made from its column letter and row number.
- Formulas and functions do calculations automatically. A formula starts with = , for example =A1+A2. Functions such as SUM, AVERAGE, MAX and MIN work on a range of cells.
- Data can be formatted, sorted and shown as charts. AutoFill fills a series of values, such as dates or numbers, automatically. The formula bar shows the contents of the selected cell.

3.4 Urdu editor — Inpage

- Inpage is a popular Urdu editor used in Pakistan for typing and printing Urdu documents, books and newspapers.
- Urdu is written from right to left, and Inpage is designed for this: it places Urdu letters correctly and joins them in the proper shape.
- To manage a document in Inpage means to create it, save it, open it, and print it, just as in a word processor.
- Text in Inpage can be formatted — font, size and style can be changed — and pictures and tables can be added to a page.

3.5 Presentation software

- Presentation software is used to make slides for a talk, a lesson or a meeting. Microsoft PowerPoint is a common example.
- Each slide can hold a title, text, pictures, tables and charts. Slides are shown one after another during a presentation.
- Slide design means choosing a layout, colours and fonts that are clear and easy to read from a distance.
- Animation moves objects on a slide, and transitions control how one slide changes to the next. Both should be used simply, so the audience listens to the speaker, not the effects.

Key terms

- Office automation — using software to do office work quickly and neatly. Word processor — a program for writing documents.
- Cell — the place where a row and a column meet in a spreadsheet. Cell address — the column letter and row number of a cell, e.g. A1.
- Formula — a calculation in a spreadsheet, starting with = . Function — a ready-made calculation such as SUM or AVERAGE.
- AutoFill — fills a series of values automatically. Formula bar — shows the contents of the selected cell.
- Inpage — an Urdu editor used for Urdu documents. Slide — one page of a presentation.

Chapter 3: Office Automation — Practice Questions

Multiple-Choice Questions

Q1. Office automation is best described as:

(A) playing games (B) using software to do office work (C) repairing computers (D) writing programs

Q2. Which program is used to write a letter?

(A) Spreadsheet (B) Word processor (C) Presentation software (D) Antivirus

Q3. In a spreadsheet, the address of the cell in column C and row 5 is:

(A) 5C (B) C5 (C) C-5 (D) 5-C

Q4. A spreadsheet formula must start with:

(A) + (B) = (C) * (D) #

Q5. Which function adds a range of numbers?

(A) AVERAGE (B) MAX (C) SUM (D) MIN

Q6. AutoFill is used to:

(A) fill a series of values automatically (B) print a document (C) delete a file (D) draw a picture

Q7. The formula bar shows:

(A) the date (B) the contents of the selected cell (C) the page number (D) the printer name

Q8. Inpage is mainly used for:

(A) English letters (B) Urdu documents (C) calculations (D) presentations

Q9. In a presentation, animation is used to:

(A) move objects on a slide (B) print slides (C) save a file (D) open a folder

Q10. Which is NOT an office automation tool?

(A) Word processor (B) Spreadsheet (C) Operating system (D) Presentation software

Short Questions

Q1. Define office automation and give two benefits.

Q2. What is a word processor? Name two things that can be inserted into a document.

Q3. What is a cell address? Give an example.

Q4. Write the formula to add the numbers in cells A1 to A5.

Q5. What is Inpage used for?

Long Questions

Q1. Explain the main features of a word processor, including managing a document, formatting text and inserting objects.

Q2. Describe a spreadsheet: cells and cell addresses, formulas and functions, and charts. Give one example of each.

> Write each answer in your own words, in full sentences. For long questions, give an introduction, the main points with examples, and a short conclusion.

Chapter 4: Data Communication

Data communication is the exchange of data between two or more devices. When you send a message, open a web page or print to a shared printer, data travels from one device to another. This chapter explains the parts of a communication system, how data travels, and the devices that carry it.

4.1 Basic terms of data communication

- Data communication is the exchange of data between two devices through a transmission medium.
- A communication system has five parts: the sender (who sends the data), the receiver (who receives it), the message (the data itself), the medium (the path it travels on), and the protocol (the rules for the exchange).
- A protocol is a set of rules that both devices follow so that they understand each other, just as two people must speak the same language to talk.
- Data can be sent as text, numbers, pictures, sound or video. Before sending, it is changed into signals that can travel through the medium.

4.2 Characteristics of a good communication system

- Delivery: the data must reach the correct receiver and no one else.
- Accuracy: the data must arrive without errors or changes.
- Timeliness: the data must arrive on time; late data, such as a delayed voice call, is not useful.
- Jitter: the time between arriving data packets should be even, so that sound and video play smoothly.

4.3 Transmission modes

- Transmission mode means the direction in which data can flow between two devices.
- Simplex mode: data flows in one direction only, for example a keyboard sending data to a computer, or a television broadcast.
- Half-duplex mode: data can flow in both directions, but only one way at a time, for example a walkie-talkie — one person speaks while the other listens.
- Full-duplex mode: data can flow in both directions at the same time, for example a telephone call or a video call.

4.4 Synchronous and asynchronous transmission

- In synchronous transmission, data is sent in a continuous stream, timed by a clock signal. It is fast and is used for large amounts of data.
- In asynchronous transmission, data is sent one character at a time, with start and stop bits marking each character. It is slower but simpler.
- Synchronous transmission is used between computers and networks; asynchronous transmission is used for simple devices such as keyboards.
- The choice depends on speed, cost and the amount of data to be sent.

4.5 Transmission media

- A transmission medium is the physical path through which data travels from sender to receiver.
- Guided media carry signals through a cable. Twisted-pair cable is used in telephone lines and local networks; coaxial cable is used for cable television; fibre-optic cable carries light signals over long distances at very high speed.
- Unguided media carry signals through the air without a cable: radio waves, microwaves, infrared and satellite links.
- Guided media are usually faster and more secure; unguided media are easier to set up and can reach places where cables cannot go.

4.6 Transmission impairments

- Transmission impairments are problems that damage the signal while it travels.
- Attenuation is the loss of signal strength over distance; a weak signal must be boosted by a repeater.
- Noise is unwanted extra signals that mix with the real signal, for example from nearby electrical equipment.
- Distortion changes the shape of the signal, so the receiver may read it wrongly. Good cables, shielding and error-checking help reduce these problems.

4.7 Communication devices

- A modem changes digital signals from a computer into analogue signals for a telephone line, and back again — it modulates and demodulates.
- A Network Interface Card (NIC) is fitted inside a computer and connects it to a network by cable or by Wi-Fi.
- A router connects different networks together and chooses the best path for data, for example between a home network and the internet.
- A switch connects devices inside one network and sends data only to the device it is meant for. An access point lets wireless devices join a wired network.

4.8 Data transmission terminologies

- Bandwidth is the amount of data that can travel through a channel in one second, measured in bits per second (bps). More bandwidth means faster transfer.
- Bit rate is the number of bits sent per second. Baud rate is the number of signal changes per second; they are not the same thing.
- Latency is the time a signal takes to travel from sender to receiver. Low latency is important for calls and games.
- Signal-to-noise ratio compares the strength of the real signal with the noise; a higher ratio means a clearer signal. A communication channel is the path, with its own bandwidth and speed, that carries the data.

Key terms

- Sender — the device that sends data. Receiver — the device that receives data. Medium — the path data travels on. Protocol — rules for communication.
- Simplex — one direction only. Half-duplex — both directions, one at a time. Full-duplex — both directions at once.
- Guided media — cables (twisted pair, coaxial, fibre optic). Unguided media — wireless (radio, microwave, infrared, satellite).
- Modem — changes digital signals to analogue and back. NIC — connects a computer to a network. Router — connects networks. Switch — connects devices in one network.
- Bandwidth — data per second. Attenuation — loss of signal strength. Noise — unwanted signals. Latency — travel time of a signal.

Chapter 4: Data Communication — Practice Questions

Multiple-Choice Questions

Q1. The five parts of a communication system include:

(A) sender, receiver, message, medium, protocol (B) mouse, keyboard, monitor, printer, speaker (C) CPU, RAM, ROM, hard disk, SSD (D) input, output, storage, processing, control

Q2. A protocol is:

(A) a cable (B) a set of rules for communication (C) a storage device (D) an output device

Q3. In simplex mode, data flows:

(A) in both directions at once (B) in one direction only (C) in both directions, one at a time (D) nowhere

Q4. A walkie-talkie is an example of:

(A) simplex (B) half-duplex (C) full-duplex (D) no transmission

Q5. Which medium carries light signals at very high speed?

(A) Twisted-pair cable (B) Coaxial cable (C) Fibre-optic cable (D) Infrared

Q6. The loss of signal strength over distance is called:

(A) noise (B) distortion (C) attenuation (D) jitter

Q7. A modem is used to:

(A) print documents (B) change digital signals to analogue and back (C) store data (D) draw pictures

Q8. Which device connects different networks together?

(A) Switch (B) NIC (C) Router (D) Access point

Q9. Bandwidth is measured in:

(A) bits per second (B) metres per second (C) bytes per minute (D) signals per hour

Q10. Low latency is most important for:

(A) printing a letter (B) voice calls and online games (C) saving a file (D) typing a document

Short Questions

Q1. Define data communication and name its five parts.

Q2. What is a protocol? Why is it needed?

Q3. What is the difference between simplex and full-duplex transmission? Give one example of each.

Q4. Name two guided media and two unguided media.

Q5. What is attenuation? How can it be reduced?

Long Questions

Q1. Explain the components of a communication system and the four characteristics of a good communication system.

Q2. Describe guided and unguided transmission media, giving examples and one advantage of each.

> Write each answer in your own words, in full sentences. For long questions, give an introduction, the main points with examples, and a short conclusion.

Chapter 5: Computer Networks

A computer network connects two or more computers so that they can share data, programs and devices such as printers. Schools, offices and homes all use networks, and the internet is the largest network of all. This chapter explains the types of networks, their shapes, and how they are organised.

5.1 What is a computer network?

- A computer network is a group of two or more computers connected together so that they can share data and resources.
- Networks let users share a printer, share files, send messages and use the same internet connection.
- A network saves money, because one printer or one internet connection can serve many computers.
- Networks also make communication easy: users can send email, share documents and work together from different computers.

5.2 Types of networks

- A Personal Area Network (PAN) connects devices around one person, such as a phone, a laptop and wireless earphones, usually by Bluetooth.
- A Local Area Network (LAN) connects computers in a small area, such as one room, one building or one school.
- A Metropolitan Area Network (MAN) connects computers across a city, for example the branches of a bank in one city.
- A Wide Area Network (WAN) connects computers over a large area — a country or the whole world. The internet is the largest WAN.

5.3 Network topologies

- Topology is the physical arrangement — the shape — in which computers are connected in a network.
- In a bus topology, all computers share one cable. It is cheap and simple, but if the main cable breaks, the whole network stops.
- In a star topology, every computer is connected to a central device, such as a switch. If one computer fails, the rest keep working; but if the central device fails, the whole network stops.
- In a ring topology, computers are connected in a circle and data travels around the ring. In a mesh topology, every computer is connected to every other computer, which is fast and reliable but expensive.

5.4 Network models

- A network model describes how computers in a network relate to each other.
- In the client-server model, one powerful computer (the server) provides services and data, and other computers (the clients) request them. A school server holding student records is an example.
- In the peer-to-peer model, all computers are equal: each one can share its files and printers with the others, and no single computer controls the network.
- Client-server networks are better for large organisations; peer-to-peer networks suit small groups of computers.

5.5 Uses and services of networks

- File sharing: users on a network can open and use files stored on another computer.
- Resource sharing: many users can share one printer, one scanner or one internet connection.
- Communication: email, messaging and video calls let people work together from different places.
- Central backup: important data can be copied to one safe place on the network, so nothing is lost if one computer fails.

5.6 The internet and intranet

- The internet is a worldwide network of networks. It connects millions of computers and lets people share information anywhere in the world.
- Common internet services are the World Wide Web, email, video calls, online learning and online shopping.
- An intranet is a private network inside one organisation, such as a school or a company. Only its own members can use it.
- An intranet uses the same technology as the internet, but its information is kept private and is not open to the public.

Key terms

- Network — computers connected to share data and resources. LAN — Local Area Network. MAN — Metropolitan Area Network. WAN — Wide Area Network. PAN — Personal Area Network.
- Topology — the shape of a network. Bus, star, ring and mesh — the four common topologies.
- Server — a computer that provides services. Client — a computer that requests services. Peer-to-peer — all computers equal.
- Internet — the worldwide network of networks. Intranet — a private network inside one organisation.

Chapter 5: Computer Networks — Practice Questions

Multiple-Choice Questions

Q1. A network is mainly used to:

(A) share data and resources (B) increase electricity use (C) make computers slower (D) print money

Q2. Which network covers a single building or school?

(A) WAN (B) MAN (C) LAN (D) PAN

Q3. The internet is an example of a:

(A) LAN (B) MAN (C) PAN (D) WAN

Q4. In a star topology, all computers connect to:

(A) one shared cable (B) a central device (C) each other directly (D) a printer

Q5. If the main cable of a bus network breaks:

(A) nothing happens (B) the whole network stops (C) only one computer stops (D) the network gets faster

Q6. In the client-server model, the server:

(A) requests services (B) provides services and data (C) is always a laptop (D) cannot store data

Q7. Which topology connects every computer to every other computer?

(A) Bus (B) Star (C) Ring (D) Mesh

Q8. An intranet is:

(A) open to everyone (B) a private network inside one organisation (C) the same as the internet (D) a type of cable

Q9. Sharing one printer among many computers is an example of:

(A) resource sharing (B) data loss (C) topology (D) protocol

Q10. Bluetooth is commonly used for a:

(A) WAN (B) MAN (C) PAN (D) LAN

Short Questions

Q1. Define a computer network and give two benefits.

Q2. What is the difference between a LAN and a WAN?

Q3. What is network topology? Name the four common topologies.

Q4. What is the difference between the client-server model and the peer-to-peer model?

Q5. What is an intranet? How is it different from the internet?

Long Questions

Q1. Explain the four types of networks (PAN, LAN, MAN, WAN) with one example of each.

Q2. Describe the bus, star, ring and mesh topologies, giving one advantage and one disadvantage of each.

> Write each answer in your own words, in full sentences. For long questions, give an introduction, the main points with examples, and a short conclusion.

Chapter 6: Computer Security and Ethics

Computers hold our photos, messages, school records and money details, so they must be protected. This chapter explains the dangers — viruses, hackers and cybercrime — how to stay safe, and how to use a computer honestly and responsibly.

6.1 Importance of computer security

- Computer security means protecting computers, networks and data from damage, theft and unauthorised use.
- Security is important because computers store personal information, school records, photos and money details that must not fall into wrong hands.
- Without security, data can be stolen, changed or destroyed, and a computer can be used to attack others.
- Good security protects the user, the computer and the data — and it protects other people too.

6.2 Cybercrime, hackers and crackers

- Cybercrime is a crime committed with a computer or over a network, such as stealing data, cheating people online, or damaging a website.
- A hacker is a person who enters a computer system without permission. Some hackers test security to help fix it; most cause harm.
- A cracker is a person who breaks into systems to steal, damage or commit crime. The word is used for hackers with criminal intent.
- Cybercrime is against the law in Pakistan. The Prevention of Electronic Crimes Act deals with such crimes.

6.3 Malware and its types

- Malware is short for malicious software — programs made to harm a computer or steal its data.
- A virus is a program that attaches itself to other programs and spreads when they are run. It can delete or damage files.
- A worm copies itself and spreads from one computer to another over a network, without needing a host program.
- A Trojan horse pretends to be a useful program but secretly harms the computer. Spyware secretly watches what the user does and steals information such as passwords. Ransomware locks the user's files and demands money to unlock them.

6.4 How malware spreads and its symptoms

- Malware spreads through infected USB drives, email attachments, fake downloads, and unsafe websites.
- Common symptoms of a malware attack are: the computer becomes slow, strange messages or pop-ups appear, files disappear or change, and programs open or close by themselves.
- Malware can also send emails or messages from the user's account without the user knowing.
- If these signs appear, the computer should be scanned with an updated antivirus and the suspicious program or file removed.

6.5 Protecting a computer from malware

- Install a good antivirus program, keep it updated, and scan the computer regularly.
- Keep the operating system and programs updated, because updates fix security weaknesses.
- Do not open email attachments or download programs from unknown or untrusted sources.
- Use strong passwords, back up important files, and do not plug in unknown USB drives. A firewall blocks unwanted connections to the computer.

6.6 Authentication and authorisation

- Authentication means proving who you are — for example by typing a password, a PIN, or using a fingerprint or face scan.
- Authorisation means deciding what an authenticated user is allowed to do — for example, a student may read a file but not delete it.
- Authorised access is access given with permission; unauthorised access is entering a system without permission, which is illegal.
- Strong authentication uses more than one method: something you know (a password), something you have (a phone code), or something you are (a fingerprint). Using two methods together is called two-factor or multimodal authentication.

6.7 Computer ethics

- Computer ethics are the rules of right and wrong behaviour when using computers.
- Ethical use means: respect other people's privacy, do not copy software or other people's work without permission (software piracy), and do not spread false or harmful material.
- Areas of computer ethics include privacy (keeping personal information safe), intellectual property (respecting copyright), honesty, and responsibility for what we share online.
- Good manners online — called netiquette — include being polite, not sending hurtful messages, and thinking before sharing anything.

Key terms

- Computer security — protecting computers and data from damage, theft and unauthorised use. Cybercrime — crime committed with a computer or network.
- Hacker — a person who enters a system without permission. Cracker — a hacker with criminal intent.
- Malware — malicious software. Virus, worm, Trojan horse, spyware, ransomware — types of malware.
- Antivirus — software that finds and removes malware. Firewall — blocks unwanted connections. Backup — a copy of important data kept safely.
- Authentication — proving who you are. Authorisation — deciding what you are allowed to do. Two-factor authentication — using two methods to prove identity.
- Ethics — rules of right and wrong behaviour. Software piracy — copying software without permission. Netiquette — good manners online.

Chapter 6: Computer Security and Ethics — Practice Questions

Multiple-Choice Questions

Q1. Computer security means protecting computers from:

(A) damage, theft and unauthorised use (B) dust only (C) old age (D) slow internet

Q2. A crime committed with a computer is called:

(A) malware (B) cybercrime (C) firewall (D) backup

Q3. A cracker is best described as:

(A) a person who repairs computers (B) a hacker with criminal intent (C) an antivirus program (D) a network device

Q4. Malware is short for:

(A) manual software (B) malicious software (C) machine software (D) memory software

Q5. Which malware copies itself over a network without a host program?

(A) Virus (B) Worm (C) Trojan horse (D) Spyware

Q6. Ransomware:

(A) speeds up a computer (B) locks files and demands money (C) deletes viruses (D) backs up data

Q7. A common symptom of a malware attack is:

(A) faster internet (B) strange pop-ups and a slow computer (C) a full battery (D) a clean screen

Q8. The best first step to protect a computer is to:

(A) install and update an antivirus (B) open all email attachments (C) use any USB drive found (D) share passwords

Q9. Proving who you are by a password or fingerprint is called:

(A) authorisation (B) authentication (C) piracy (D) netiquette

Q10. Copying software without permission is called:

(A) backup (B) software piracy (C) firewall (D) encryption

Short Questions

Q1. Define computer security and give two reasons why it is important.

Q2. What is the difference between a hacker and a cracker?

Q3. Name four types of malware and say what each one does.

Q4. State three ways to protect a computer from malware.

Q5. What is the difference between authentication and authorisation?

Long Questions

Q1. Explain malware and its main types (virus, worm, Trojan horse, spyware and ransomware), how malware spreads, and how a computer can be protected from it.

Q2. Describe computer ethics: what it means, its main areas (privacy, intellectual property, honesty and responsibility), and how a student should behave online.

> Write each answer in your own words, in full sentences. For long questions, give an introduction, the main points with examples, and a short conclusion.

MCQ Answer Key

Answers to all multiple-choice questions, chapter by chapter.

Chapter 1	Ch 1 Q1: B · Ch 1 Q2: C · Ch 1 Q3: C · Ch 1 Q4: C · Ch 1 Q5: B · Ch 1 Q6: C · Ch 1 Q7: A · Ch 1 Q8: D · Ch 1 Q9: B · Ch 1 Q10: C
Chapter 2	Ch 2 Q1: B · Ch 2 Q2: B · Ch 2 Q3: B · Ch 2 Q4: C · Ch 2 Q5: B · Ch 2 Q6: B · Ch 2 Q7: A · Ch 2 Q8: B · Ch 2 Q9: B · Ch 2 Q10: B
Chapter 3	Ch 3 Q1: B · Ch 3 Q2: B · Ch 3 Q3: B · Ch 3 Q4: B · Ch 3 Q5: C · Ch 3 Q6: A · Ch 3 Q7: B · Ch 3 Q8: B · Ch 3 Q9: A · Ch 3 Q10: C
Chapter 4	Ch 4 Q1: A · Ch 4 Q2: B · Ch 4 Q3: B · Ch 4 Q4: B · Ch 4 Q5: C · Ch 4 Q6: C · Ch 4 Q7: B · Ch 4 Q8: C · Ch 4 Q9: A · Ch 4 Q10: B
Chapter 5	Ch 5 Q1: A · Ch 5 Q2: C · Ch 5 Q3: D · Ch 5 Q4: B · Ch 5 Q5: B · Ch 5 Q6: B · Ch 5 Q7: D · Ch 5 Q8: B · Ch 5 Q9: A · Ch 5 Q10: C
Chapter 6	Ch 6 Q1: A · Ch 6 Q2: B · Ch 6 Q3: B · Ch 6 Q4: B · Ch 6 Q5: B · Ch 6 Q6: B · Ch 6 Q7: B · Ch 6 Q8: A · Ch 6 Q9: B · Ch 6 Q10: B

End of book. Good luck with your studies — revise the key terms, practise the questions again, and check the current model paper on your board's official website before your examination.