



Computer Science Preparation – M4 – T1 Exam

UNIT 1 - Safe Use of IT

01. Safe use of Information Technology

Information technology is technology that helps people communicate and share information. If we are not careful or we do not understand how to use the technology it might affect us or our friends.

Common Online Threats

- **Malware** – harmful software
 - o **Computer Virus** – malicious software that can harm data or systems
 - o **Worms** – malicious programs that can spread to other computers in the network on their own and cause damage to data and servers
 - o **Trojan Horse** – A program that looks like a common program to trick users into installing and running
- **Phishing** – a scammer pretends to be someone you trust to trick you into giving away important information
- **Password theft** – someone tries to steal your password
- **Online scam** – Tricks to steal money/accounts
- **Harmful content** – Unsafe or inappropriate content

New cyber threats

- **AI Voice Cloning** – AI can copy a person's voice and use it to trick people.
- **Deepfake Videos** – AI can create realistic-looking videos of things that never happened.
- **Fake AI Images** – AI can create images that look real but are completely made up.
- **AI-Generated Scam Messages** – AI can create convincing messages designed to trick people.

Threat Prevention & Passwords

We use **passwords** to protect our account and our information. Weak passwords mean someone can easily guess it and take our information, that is why we need to always make strong passwords.

Steps for making a strong password:

- Length minimum 8 characters
- Use special symbols – @!.,*()#\$%
- Include numbers – 0,1,...8,9
- Mixed uppercase and lowercase letters (a-z, A-Z)

Two-Factor Authentication (2FA) – is an extra step protection for our account. It is a verification using a one-time password (OTP) sent to a phone or email

02. Digital Responsibility and Safe Technology Use

Digital responsibility means using technology in a way that is: safe, respectful, legal and healthy.

A **digital footprint** is the trail of information you leave behind when you use the internet. There are two types of digital footprints:

- **Active footprint** – happens when you share data on purpose
- **Passive footprint** – happens when your data is collected without you knowing

Cyberbullying is using technology to hurt or harm other people.

Examples include:

- Mean comments
- Sharing embarrassing photos
- Excluding people from groups
- Spreading rumours
- Creating fake accounts

What should you do?

- Speak up.
- Support others.
- Stop cyberbullying

Safe and Healthy Technology Use – Technology is useful, but we should use it responsibly.

1. Take Screen breaks
2. Protect your sleep
3. Balance online and offline life
4. Avoid using devices during important tasks
5. Check reliable information

03. Data and Personal information

We create data all the time. Some data can identify us, so we need to understand and protect it.

Information is data that has meaning and is useful.

Data is raw facts, numbers, words, images and sounds that have no meaning. It is divided into two groups

- **Quantitative data** – data in form of numbers
- **Qualitative data** – data in form of text

Personal data is data that can identify a person or give information about them

 Name	 Student ID	 Birthday	 School
 Address	 Email address	 Photos	 Online behaviour
 Phone number	 Birthday	 Username	 Location

Some personal data is **more sensitive** because it can cause serious harm if it is misused.

Example:  Passwords,  ID Card Numbers,  Bank Information,  Health Information,
 Location History,  Private Messages,  Biometric Data

Data Privacy Risks ⚠️

When personal information is shared, it can sometimes be used in ways we do not want.

- **Identity Theft** - Someone steals your personal information and pretends to be you.
- **Scams** - People use your data to trick you into giving them: Money or Information
- **Targeted Advertising** - Companies use your data to show advertisements designed to influence what you buy or do
- **Embarrassment** - Private information or photos may be shared without your permission.
- **Hacking** - Hackers may break into accounts and steal: Data, Money, Personal information
- **Tracking** - Apps and websites may track where you go and build a record of your movements.
- **Reputation Damage** - False or private information may be shared and damage your reputation.
- **Unfair Decisions** - Your data could potentially be used to judge you unfairly for things such as: School, Jobs, Opportunities

04. Search Engines and Reliable Information

Not everything online is true. Think before you trust, check the source, and look for evidence.

A search engine is a tool that helps users find information on the internet.

Search engines help organize and rank information so users can find relevant results.

Search engines find information in **three main steps**:

1. **Crawling** - Search engines find web pages.
2. **Indexing** - They store and organize information about those pages.
3. **Ranking** - They decide which results appear first.

Keywords are the important words you use when searching for information. Using better keywords helps you find:

✓ More accurate information

✓ More relevant results

✓ Faster answers

How to Check if Information Is Reliable

 **AUTHOR** — Who wrote it?

 **EVIDENCE** — Does it show facts or sources?

 **DATE** — Is it recent?

 **COMPARE** — Do other reliable sources agree?

 **PURPOSE** — Why was it created?

Red Flags of Unreliable Information 🚩

Be careful if you see these warning signs.

✗ No author

✗ Shocking headline

✗ No evidence

✗ Emotional language

✗ No date

✗ Too many ads

✗ Strange website name

✗ Only one source reporting it

UNIT 2 – Working principles of computer systems

Computer parts – Inside

Motherboard – Main circuit board. Connects all other components and lets them communicate with each other

Processor (CPU) – This is the brain of the computer; it does all of the work in the computer.

Random Access Memory (RAM) – used for saving information from programs that are being used now. After it loses electricity all the data is deleted. It is **temporary** memory.

Hard Disk Drive (HDD) – used for saving users' information and data. After it loses electricity all of the data will stay. It is **permanent** memory.

Solid State Drive (SSD) – same as HDD, used for saving data. Faster and better than HDD

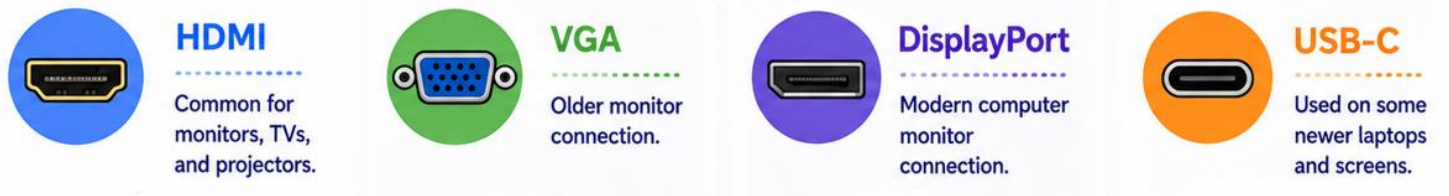
Graphical card (GPU) – is used to show graphical information on the screen

Power supply – is used to bring electricity to the computer

Computer parts – Outside

Case – A case is just a metal or plastic box that contains all the parts of the computer

Monitor – A device that displays/shows video and graphical information made by the GPU. We divide them into 2 groups: LCD and CRT. **CRT** is a large and heavy monitor, old and not used much. **LCD** is a thin and light monitor, used everywhere.



We divide outside devices into two groups:

Input device – Sends information **into** the computer (mouse, keyboard, scanner, camera, microphone...)

Output device – Shows or plays information **from** the computer (Speaker, printer, monitor, headphones, projectors...)

Software and Applications

Hardware – physical parts, everything we can touch. **Software** – programs and apps, we can't touch it.

Software – program that tells the computer what to do (Operating system, Applications, Games, Web browsers)

Application – is a software that helps users do a task (write documents, browse websites, edit photos, send messages)

We divide applications into 3 platforms:

Computer application – Runs on a desktop/laptop

Mobile application – Runs on phones/tablets

Web application – Runs in a browser

Operating system – is a software that manages the computer (Windows, macOS, Linux, Android, iOS, ChromeOS)

Memory and storage

Memory and storage are used to save information and data on the computer. **Memory** is used to save program information and **storage** is used to save users' information. Storage is divided according to the technology media that we are using:

Magnetic storage – HDD is a magnetic storage that uses magnetic disks that spin. Can store lots of data, but it is slower.

Optical storage – Optical storage is usually written and read by a laser. Stores data on CDs and DVDs. Less common today.

Electronic storage – Uses electronic chips to save data, such as flash drives and SSD. They are faster and better than magnetic and optical storage

UNIT 3 - Communication Technology

Communication Technology

Basic components of data communication are sender, receiver, information, medium, and a communication protocol. Communication means sending information from one place/device to another.

Component	Meaning	Example
Sender	The person/device that sends information	Phone sending a message
Receiver	The person/device receiving information	Friend receiving message
Information	The message being sent	Text, image, video
Medium	The path used to send information	WiFi, cable
Protocol	Rules for communication	Internet rules

Computer Networks

A **computer network** is a connection between two or more devices that exchange information and share resources. They can share data between them and work on the same thing from different locations

A computer network can be divided according to **network management** characteristics. We divide them into 3 types:

- **PAN** - Connection of computer equipment for personal use
- **LAN** - Connection of computers and devices in a near area
- **WAN** - Connection of computers that form a computer system together at a large distance

Networks can also be categorized **by** their **nature** as follows:

- **Client-server network** - This type of network depends on the server. The server receives requests from many different clients at the same time. One powerful server provides services to many clients.
- **Peer-to-peer (P2P) network** - A peer-to-peer network is a type of network where every computer can act as a receiver and a service provider at the same time. Every computer can share resources.

Communication Medium

The **communication medium** in a computer network connects the devices in the network together. It is used for sending information from the source (sender) to the destination (receiver). It can be both wired (cables) and wireless (no cables).

Wired medium:

- **UTP** – The wires are twisted together which helps guide the signal better. Found in homes as a telephone wire or as a LAN cable
- **Fiber Optic Cable** - uses light to transfer data and that is why it is faster than normal cables.
- **USB** – used to connect the computer with other devices. Can be used for transferring data

Wireless media connects two or more devices by using electromagnetic waves

For example:

WiFi

Bluetooth

Infrared

NFC

Network equipment or **computer networking** devices are electronic devices that are required for communication and interaction between devices on a computer network. We can divide them by type of use, and by connection (wired or wireless)

- **Router** – connects your network to the internet
- **Switch** – connects devices inside of a network
- **Wireless Access Point (WAP)** – connects wireless devices using a Wi-Fi signal. It can also extend the wireless network

Internet and its services

The **Internet** is the global system connecting computers and devices all over the world in one big network.

An **IP Address** is a unique address that identifies a device on the internet or a local network

IP address	Number of bits	Example
IPv4	32 bit	192.168.0.1
Ipv6	128 bit	2001:db8:0:1234:0:567:8:1

A **domain name** is a text name for an internet resource (computers, networks, and services). Easier to remember than an IP address.

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