G.C.E. O/L Grade 10 ICT

Lesson 1: The Computer in the Information World

- 1.1 ICT and National Development
- 1.2 The Computer as a System: Data to Information
- 1.3 Evolution of Computers and Computer Generations

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G.C.E. O/L Grade 10 ICT · Lesson 1

1.1 ICT and National Development

ICT is all around us – in our phones, schools, banks, hospitals and farms. In this note you will learn what ICT is, and how it helps Sri Lanka grow. We also look at new technologies like AI, IoT, cloud and 5G.

1. What is ICT?

ICT means **Information and Communication Technology**. It is the use of computers, phones, networks and the Internet to **collect, store, process, send and receive information**.

> 💡 Think of it like this: **IT** (Information Technology) is the computer side – storing and processing. **C** (Communication) is the sending side – phones, Internet, Wi-Fi. Put them together and you get **ICT**.

Computer
Stores and processes data very fast.

Communication
Phone networks, Internet, Wi-Fi and fibre carry information.

Software and apps
Programs tell the device what to do.

People
People use ICT to learn, work and get services.

2. ICT and national development

A country develops when people get better education, health, jobs and services. ICT makes these **faster, cheaper and easier to reach**, even from a village.

Field	How ICT helps	Everyday Sri Lankan example
e-Government	Government services online, less queues and paperwork.	Checking O/L results online, renewing a vehicle revenue licence online, 1919 Government Information Centre.
Agriculture	Weather news, crop advice, market prices, smart watering.	A farmer gets crop advice and prices by SMS or an app; a soil sensor switches on water only when needed.
Education	Learning anytime, anywhere.	e-Thaksalawa lessons, online classes on Zoom or Google Meet, Google Classroom homework.
Health	Faster care and better records.	Booking a doctor through e-channelling, 1990 Suwa Seriya ambulance, hospital patient records on computer, telemedicine video calls.

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Industry and business	Machines and computers work faster with fewer mistakes.	Robots in garment factories, CAD to design products, online shops, QR code payments, online banking.
Entertainment and media	Music, films, games and news on demand.	Watching YouTube, listening to music online, e-newspapers, online games.

3. New technologies helping development (2026 syllabus)

NEW 2026 These topics were added to the 2026 revised Grade 10 syllabus. Learn the basic idea and one or two everyday uses of each.

Artificial Intelligence (AI)
Computers that can do "thinking" jobs such as understanding speech, recognising faces and answering questions. Examples: chatbots, Google Translate (Sinhala ↔ English), face unlock on a phone.

Machine Learning (ML)
A type of AI where the computer **learns from many examples** instead of being told every rule. Example: your email learns which mails are spam; YouTube learns what videos you like.

Internet of Things (IoT)
Everyday things with sensors that connect to the Internet and share data. Smart home: lights or a CCTV camera controlled from a phone. Smart farm: soil sensors and automatic watering.

Cloud computing
Using storage and software on the Internet instead of only on your own device. Examples: Google Drive, OneDrive, Google Workspace (Docs, Sheets), Microsoft 365 (formerly Office 365).

Fast networks: 4G/5G, Wi-Fi 6, fibre
4G and 5G are mobile network generations; 5G is faster with less delay. Wi-Fi 6 handles many devices at once. Fibre optic cables carry data as light – very fast home and office Internet.

Online collaboration
Working and learning together from different places: Zoom, Microsoft Teams, Google Meet video meetings, shared documents and remote learning platforms.

💡 Think of the cloud like a **bank locker for your files**: your files are kept safely somewhere else, and you can open them from any device with your password.

4. Advantages and problems of ICT

Advantages	Problems to manage
Saves time and travel (online services).	Digital divide – some people have no device or Internet.
New jobs: software, BPO, online business, ICT support.	Some routine jobs are done by machines.
Fast, accurate work with fewer mistakes.	Cyber threats: phishing, ransomware, fake news.
Learning and health care reach villages.	Health issues from too much screen time.

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5. Use ICT safely and responsibly

- **Data privacy:** do not share your NIC number, passwords, OTP codes or home address on social media. Sri Lanka has a Personal Data Protection Act (No. 9 of 2022).
- **Phishing:** fake messages or websites that try to steal passwords or bank details (e.g. "You won a prize, click this link"). Do not click – check first.
- **Ransomware:** harmful software that locks your files and asks for money. Keep backups (e.g. in the cloud) and update your software.
- **Digital citizenship:** be kind online, respect others' work, check news before sharing, use strong passwords and two-step verification.

Key Words

ICT – Information and Communication Technology – using computers and communication to handle information.	**e-Government** – Giving government services to people online.
Telemedicine – A doctor helping a patient from far away using video calls and the Internet.	**Artificial Intelligence (AI)** – Computers doing tasks that normally need human thinking.
Machine Learning – A part of AI where computers learn from examples (data).	**Internet of Things (IoT)** – Everyday devices with sensors connected to the Internet.
Cloud computing – Using storage and software over the Internet.	**5G** – The fifth generation of mobile networks – faster with less delay than 4G.
Fibre optics – Thin glass cables that carry data as light, very fast.	**Phishing** – Fake messages or websites made to steal passwords or money.
Ransomware – Malware that locks files and demands money to unlock them.	**Digital divide** – The gap between people who can use ICT and people who cannot.

Sample Q&A

1. What does ICT stand for?

> **Answer:** Information and Communication Technology. It joins computers (IT) with communication (phones, Internet).

2. Give one example of e-Government in Sri Lanka.

> **Answer:** Checking O/L or A/L results online. People get the service from home without going to an office.

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3. How can IoT help a farmer?

> **Answer:** A soil moisture sensor checks if the soil is dry and switches on the water pump automatically. This saves water and time.

4. What is cloud storage? Give an example.

> **Answer:** Saving files on servers on the Internet so you can open them from any device. Example: Google Drive or OneDrive.

5. Name two tools used for online classes.

> **Answer:** Zoom and Google Meet (Microsoft Teams is also used). Teachers and students can meet by video from home.

6. What should you do if you get an SMS saying "You won Rs. 1 million, click here"?

> **Answer:** Do not click the link or share any OTP or password. It is probably phishing. Delete it or tell an adult.

MCQ

1. What does ICT stand for?

A. Information and Communication Technology
B. Information and Computer Training
C. International Communication Technology
D. Internet and Computer Technology

2. Which of these best describes ICT?

A. Writing letters by hand
B. Only repairing computers
C. Using computers and communication technology to handle information
D. Only using a telephone

3. Checking exam results on the Department of Examinations website is an example of:

A. Telemedicine
B. Online gaming
C. e-Government
D. e-Commerce

4. A farmer gets crop advice and market prices on his mobile phone. This is ICT in:

A. Agriculture
B. Health
C. Entertainment
D. Banking only

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5. Booking a doctor’s appointment online through e-channelling is ICT in:

A. Industry
B. Health
C. Agriculture
D. Entertainment

6. Which is an example of Artificial Intelligence (AI) in daily life?

A. Printing a photocopy
B. A ruler measuring a line
C. A ceiling fan turning
D. A phone unlocking by recognising your face

7. In Machine Learning, a computer mainly:

A. Only stores files
B. Works without any data
C. Learns patterns from many examples (data)
D. Only prints documents

8. A home where lights and a CCTV camera can be controlled from a phone uses:

A. Fax machines
B. Internet of Things (IoT)
C. Vacuum tubes
D. Punched cards

9. Which is a cloud storage service?

A. Google Drive
B. A pen drive
C. A DVD
D. A printer

10. Google Workspace and Microsoft 365 are examples of:

A. Input devices
B. Computer viruses
C. Cloud-based office services
D. Mobile networks

11. Compared with 4G, the main benefit of 5G is:

A. It works only with landline phones
B. It needs no towers or antennas
C. It stores files permanently
D. Higher speed and less delay

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12. Fibre optic cables carry data as:

A. Light
B. Paper signals
C. Sound waves
D. Water pressure

13. Which tool is used for online video meetings and classes?

A. Calculator
B. Microsoft Teams
C. Paint
D. Notepad

14. An email says your bank account is blocked and asks for your password through a link. This is:

A. e-Learning
B. Machine learning
C. Cloud computing
D. Phishing

15. Malware that locks your files and asks for money is called:

A. Shareware
B. Ransomware
C. Firmware
D. Freeware

Structured Questions

1. (i) Write the full form of ICT. (1 mark)
(ii) Name two fields in Sri Lanka where ICT is used and give one example for each. (4 marks) *(5 marks)*

> (i) Information and Communication Technology.
> (ii) Any two, e.g. **Education** – online classes on Zoom / e-Thaksalawa lessons; **Health** – e-channelling doctor appointments; **Agriculture** – crop advice by SMS/app; **e-Government** – online exam results.

2. (i) What is e-Government? (2 marks)
(ii) Write two advantages of e-Government for citizens. (2 marks) *(4 marks)*

> (i) Providing government services and information to people using ICT / the Internet.
> (ii) Saves time and travel cost; no long queues; services available 24 hours; less paperwork; more transparency (any two).

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3. (i) What is Artificial Intelligence (AI)? (2 marks)
(ii) Explain what Machine Learning means with one example. (2 marks)
(iii) Give two everyday uses of AI. (2 marks) *(6 marks)*

> (i) The ability of computers to do tasks that normally need human intelligence, such as understanding language or recognising images.
> (ii) A type of AI where the computer learns patterns from many examples (data) instead of fixed rules. Example: an email spam filter, video recommendations.
> (iii) Chatbots, language translation, face unlock, voice assistants, navigation apps (any two).

4. (i) What is the Internet of Things (IoT)? (2 marks)
(ii) Describe one use of IoT in a smart home and one in smart agriculture. (4 marks) *(6 marks)*

> (i) A network of everyday devices with sensors and software that connect to the Internet and share data.
> (ii) Smart home: switching lights, fans or a CCTV camera on/off from a phone; a smart door lock. Smart agriculture: soil moisture sensors switch on watering automatically; sensors check temperature in a greenhouse.

5. (i) What is cloud computing? (2 marks)
(ii) Name one cloud storage service and one cloud-based office service. (2 marks)
(iii) Give one advantage of cloud storage for a student. (1 mark) *(5 marks)*

> (i) Using storage, software and computing services over the Internet instead of only on your own computer.
> (ii) Storage: Google Drive / OneDrive. Office: Google Workspace / Microsoft 365.
> (iii) Files can be opened from any device; files are safe even if the phone is lost; easy sharing with classmates.

6. (i) Write two problems that can come with the use of ICT. (2 marks)
(ii) What is phishing? (1 mark)
(iii) Write two things a student can do to protect personal data online. (2 marks) *(5 marks)*

> (i) Digital divide; cyber crime (phishing, ransomware); fake news; health problems from screen use; some jobs replaced by machines (any two).
> (ii) Tricking people with fake messages or websites to steal passwords, OTPs or bank details.
> (iii) Use strong passwords and two-step verification; never share OTP/password; keep profiles private; do not click unknown links; keep backups (any two).

Summary

- ICT = Information and Communication Technology: computers + communication used to handle information.

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- ICT supports national development in e-Government, agriculture, education, health, industry and entertainment.
- AI lets computers do thinking tasks; Machine Learning learns from examples.
- IoT connects everyday devices with sensors – smart homes and smart farms.
- Cloud computing gives storage and software over the Internet (Google Drive, Google Workspace, Microsoft 365).
- 4G/5G, Wi-Fi 6 and fibre optics give fast connections; Zoom, Teams and Meet allow online learning and work.
- ICT has problems too: digital divide, phishing, ransomware and fake news.
- Protect your data: strong passwords, no OTP sharing, check links, keep backups.

MCQ answer key – 1.1

1. **A** – ICT = Information and Communication Technology.
2. **C** – ICT joins computers and communication to collect, process and share information.
3. **C** – A government service given online is e-Government.
4. **A** – Crop advice and prices help farming, so it is agriculture.
5. **B** – Doctor appointments belong to the health field.
6. **D** – Face recognition is a “thinking” task done by AI.
7. **C** – ML learns from examples, like a spam filter learning from many emails.
8. **B** – Devices connected to the Internet and controlled remotely are IoT (a smart home).
9. **A** – Google Drive keeps files on Internet servers. A pen drive is local storage.
10. **C** – They give Docs, Sheets, Word, Excel, email and storage over the Internet.
11. **D** – 5G is the newer mobile generation: faster with lower delay (latency).
12. **A** – Fibre uses pulses of light inside thin glass strands.
13. **B** – Teams, Zoom and Google Meet are online collaboration tools.
14. **D** – Fake messages that try to steal passwords are phishing.
15. **B** – Ransomware holds files “for ransom”. Backups and updates help protect you.

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1.2 The Computer as a System: Data to Information

A computer takes in raw facts (data), works on them, and gives us useful results (information). In this note you will learn what a system is, the difference between data and information, and how processing changes data into information – with examples from apps, sensors and the cloud.

1. What is a system?

A **system** is a group of parts that **work together to reach a goal**. Every system has three main parts: **Input** → **Process** → **Output**.

> 💡 Think of it like making **kiribath**: rice, coconut milk and salt go in (**input**), you cook them (**process**), and you get kiribath (**output**).

System	Input	Process	Output
Rice cooker	Rice, water, electricity	Heating and cooking	Cooked rice
ATM	Card, PIN, amount	Checks PIN and balance	Cash and a receipt
School report	Marks of each subject	Total, average, rank	Report card
Smart farm (IoT)	Soil moisture sensor reading	Is the soil too dry?	Pump ON + alert on the phone

Many systems also have **storage** (keeping data to use later) and **feedback** (using the output to adjust the next input), e.g. a fridge thermostat switches the cooling on and off by checking the temperature again and again.

2. Data and information

Data
Raw facts with no clear meaning yet: numbers, words, pictures, sounds. Example: 65, 78, 42, 90.

Information
Processed data that has meaning and helps us decide. Example: “Nimal’s average is 68.75 and he is 5th in the class.”

Data (input)	Information (output)
Temperature readings every hour: 29, 31, 33 °C	“Today will be hot – drink water” on a weather app
GPS positions of many phones on a road	Red line on Google Maps: traffic jam ahead
Steps counted by a smart watch	“You walked 6,500 steps today”
Each item price scanned at a supermarket	Bill with total amount

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💡 Easy test: if it answers a question and helps you decide something, it is **information**. If it is just a list of facts, it is **data**. The information from one system can become the data for another.

3. Processing: turning data into information

Processing is the work done on data to give information. Common ways:

Calculating
Total, average, percentages.

Sorting
Putting in order, e.g. marks highest to lowest.

Classifying
Grouping, e.g. pass / fail, A–W grades.

Comparing and searching
Finding a name, checking a PIN.

Summarising
Charts and short reports.

NEW 2026 Modern example (2026 syllabus): a **smart watch** (IoT device) collects heart-rate data → sends it over the Internet to the **cloud** → cloud servers (sometimes using **AI**) process it → the **app** on your phone shows "Your heart rate is normal". Input, process, storage and output can now happen in different places.

4. The computer as a system

Part	Job	Examples
Input	Brings data in	Keyboard, touch screen, microphone, camera, sensors, QR scanner
Process	Works on data	CPU (processor) in the computer or phone; cloud servers
Output	Gives results	Screen, speaker, printer, phone notification
Storage	Keeps data and results	SSD, memory card, cloud storage (Google Drive)

5. Parts of an information system

An **information system** collects, processes, stores and shares information for people. Example: the school exam results system or a bank's mobile app. It has these parts:

- **Hardware** – the physical devices (computers, phones, servers).
- **Software** – programs and apps that tell hardware what to do.
- **Data** – the raw facts that go into the system.
- **People** – users and staff who enter data and use the information.
- **Procedures** – the rules and steps for using the system.
- **Network** – connects everything (Internet, Wi-Fi, mobile data).

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6. Good information

Information is useful only if it is **accurate** (correct), **timely** (on time), **relevant** (to the point), **complete** and **easy to understand**. Wrong data in gives wrong information out – this is called **GIGO: Garbage In, Garbage Out**.

Key Words

System – Parts working together to reach a goal.	**Input** – Data or instructions that go into a system.
Process – Work done on data to change it into information.	**Output** – The result that comes out of a system.
Storage – Keeping data and information for later use.	**Feedback** – Using the output to control or adjust the next input.
Data – Raw facts without a clear meaning.	**Information** – Processed data that is meaningful and useful.
Sensor – A device that measures things like heat, light or moisture and sends the data.	**Information system** – Hardware, software, data, people, procedures and network working together to give information.
GIGO – Garbage In, Garbage Out – wrong input gives wrong output.	**Cloud processing** – Data processed on Internet servers instead of only on your device.

Sample Q&A

1. What are the three main parts of a system?

> **Answer:** Input, process and output. Example: in a rice cooker, rice and water are input, cooking is the process, and rice is the output.

2. Is “45, 67, 89” data or information? Why?

> **Answer:** Data. They are only numbers with no clear meaning. If we say “the class average is 67”, that is information.

3. Give two examples of processing.

> **Answer:** Calculating an average and sorting names in alphabetical order. Both change data into something useful.

4. How is a sensor used as an input device?

> **Answer:** A sensor measures something (like soil moisture or temperature) and sends that reading into the system as data.

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5. What does GIGO mean?

> **Answer:** Garbage In, Garbage Out. If you enter wrong data, the computer gives wrong information.

6. Name the parts of an information system.

> **Answer:** Hardware, software, data, people, procedures and network.

MCQ

1. A system is best described as:

A. A single computer part
B. Any random list of numbers
C. Only a printed report
D. A group of parts working together to reach a goal

2. What is the correct order in a system?

A. Input → Process → Output
B. Input → Output → Process
C. Output → Input → Process
D. Process → Output → Input

3. In an ATM, the PIN number you type is the:

A. Feedback only
B. Input
C. Process
D. Output

4. Which of these is data?

A. “Kamal came first in the class”
B. “The class average is 70”
C. “Most students passed Maths”
D. A list of marks: 56, 72, 81

5. Information is:

A. A type of input device
B. Processed data that has meaning
C. Only pictures and sounds
D. Raw facts that are not processed

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6. Finding the average of a student’s marks is an example of:

A. Processing (calculating)
B. Storage
C. Output device
D. Input

7. Arranging students’ names in alphabetical order is:

A. Sorting
B. Printing
C. Scanning
D. Typing

8. In a smart farm, a soil moisture sensor works as the:

A. Output
B. Input
C. Processor
D. Printer

9. A fitness app showing “You walked 6,500 steps today” is giving:

A. Information
B. Hardware
C. Input
D. Raw data only

10. Saving your photos in Google Drive so you can open them later is an example of:

A. Sorting
B. Input
C. Cloud storage
D. Feedback

11. A fridge thermostat checks the temperature and switches cooling on again. This shows:

A. Sorting
B. Phishing
C. Feedback
D. Printing

12. Which is NOT a part of an information system?

A. People
B. Weather
C. Software
D. Procedures

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13. GIGO means:

A. Good Input, Good Output
B. Go In, Go Out
C. General Input, General Output
D. Garbage In, Garbage Out

14. Information given after the exam is over, when it is no longer useful, is NOT:

A. Stored
B. Printed
C. Timely
D. Digital

Structured Questions

1. (i) What is a system? (2 marks)
(ii) Name the input, process and output of a rice cooker. (3 marks) *(5 marks)*

> (i) A group of parts that work together to achieve a common goal.
> (ii) Input: rice, water, electricity. Process: heating / cooking. Output: cooked rice.

2. (i) Write one difference between data and information. (2 marks)
(ii) Classify these as data or information: (a) 32, 30, 35 °C (b) "Tomorrow will be rainy" (c) a list of names (d) "Ruwan has the highest marks". (4 marks) *(6 marks)*

> (i) Data are raw, unprocessed facts without clear meaning; information is processed data that is meaningful and helps decisions.
> (ii) (a) data (b) information (c) data (d) information.

3. A school uses a computer to prepare term test reports.
(i) Write two data items used as input. (2 marks)
(ii) Write two processing steps. (2 marks)
(iii) Write one output. (1 mark) *(5 marks)*

> (i) Student name / index number, marks of each subject.
> (ii) Calculating total and average; sorting to find the rank; classifying grades.
> (iii) Printed report card / class merit list.

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4. A smart watch measures heart rate and an app on the phone shows a health message.
(i) What is the input device here? (1 mark)
(ii) Where can the data be processed and stored? (2 marks)
(iii) What is the output? (1 mark)
(iv) Why is this an IoT system? (2 marks) *(6 marks)*

> (i) The heart-rate sensor in the smart watch.
> (ii) In the phone/app and on cloud servers (cloud storage).
> (iii) The health message / chart shown on the phone.
> (iv) An everyday device with a sensor is connected to the Internet and shares data automatically.

5. (i) Name four parts of an information system. (4 marks)
(ii) Explain the role of "people" in an information system. (2 marks) *(6 marks)*

> (i) Any four: hardware, software, data, people, procedures, network.
> (ii) People enter data, operate the system and use the information to make decisions.

6. (i) Write three qualities of good information. (3 marks)
(ii) What is GIGO? Give an example. (2 marks) *(5 marks)*

> (i) Any three: accurate, timely, relevant, complete, easy to understand.
> (ii) Garbage In, Garbage Out – wrong input gives wrong output. Example: typing 9 instead of 90 for a mark gives a wrong average.

Summary

- A system is a set of parts working together for a goal: Input → Process → Output.
- Many systems also use storage and feedback.
- Data are raw facts; information is processed, meaningful data.
- Processing methods: calculating, sorting, classifying, comparing/searching, summarising.
- Modern systems: IoT sensors give input, the cloud processes and stores, apps show output.
- An information system = hardware, software, data, people, procedures, network.
- Good information is accurate, timely, relevant and complete. GIGO: wrong in, wrong out.

MCQ answer key – 1.2

1. **D** – Parts + working together + a goal = a system.
2. **A** – Data goes in, is processed, then results come out.
3. **B** – You give the PIN to the system, so it is input.
4. **D** – Raw numbers without meaning are data; the others are processed results.
5. **B** – Information = data + processing + meaning.
6. **A** – Calculating is a processing method.
7. **A** – Putting items in order is sorting.
8. **B** – The sensor measures and sends data into the system – input.

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9. **A** – The step readings were processed into a meaningful message.
10. **C** – Keeping data on Internet servers is cloud storage.
11. **C** – Output (temperature) is used to adjust the system – feedback.
12. **B** – Parts are hardware, software, data, people, procedures and network.
13. **D** – Wrong data in → wrong information out.
14. **C** – Good information must arrive on time – it must be timely.

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1.3 Evolution of Computers and Computer Generations

Computers did not appear in one day. People first counted with simple tools, then built machines, and finally made electronic computers. In this note you will learn the main early devices, the five computer generations, how computers became better, and today's trends.

1. Early calculating devices

> 💡 Think of it like a family tree: the abacus is the great-grandparent, Babbage's engine is the grandparent, and your smartphone is the youngest child.

Device	Who / when	Simple idea
Abacus	Ancient times (thousands of years ago)	Beads on rods for adding and subtracting.
Napier's Bones	John Napier, 1617	Numbered rods to help multiply.
Pascaline	Blaise Pascal, 1642	Gear wheels that add and subtract – an early mechanical calculator.
Jacquard loom	Joseph Jacquard, 1804	Punched cards controlled the weaving pattern – the idea of a "program".
Difference and Analytical Engines	Charles Babbage, 1820s–1830s	Designs with input, store (memory), processing unit and output – like a modern computer. He is called the "Father of the Computer".
First program	Ada Lovelace, 1843	Wrote steps for the Analytical Engine – called the first computer programmer.
Tabulating machine	Herman Hollerith, 1890	Used punched cards to count the US census quickly.

2. The five computer generations

A **generation** is a stage in computer history based on the **main electronic part used to build the processor**.

Generation	Main technology	What it was like	Examples
1st (about 1940–1956)	Vacuum tubes	Huge (filled a room), very hot, used a lot of power, often broke down. Machine language.	ENIAC, UNIVAC

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2nd (about 1956–1963)	Transistors	Smaller, faster, cooler and more reliable. Assembly language.	IBM 1401
3rd (about 1964–1971)	Integrated Circuits (ICs)	Many transistors on one small chip. Keyboards, monitors and operating systems came in.	IBM System/360
4th (1971 – today)	Microprocessors (LSI, VLSI)	Whole CPU on one chip. Personal computers, laptops, the Internet, GUIs.	Intel 4004, IBM PC, laptops
5th (present and future)	AI, ULSI chips, parallel processing	Computers that understand speech and images, learn from data, and use many processor cores together.	AI assistants, chatbots, self-driving car research

💡 Easy memory trick: **V – T – I – M – A** = **V**acuum tube, **T**ransistor, **I**C, **M**icroprocessor, **AI**.

LSI = Large Scale Integration (thousands of transistors on a chip). **VLSI** = Very Large Scale Integration (millions or more). Today's phone chips contain billions of transistors.

3. How computers improved

Feature	Then (1st generation)	Now
Size	Filled a whole room	Fits in your pocket (smartphone)
Speed	Thousands of operations per second	Billions per second
Storage capacity	Very small memory	Gigabytes to terabytes on SSDs and in the cloud
Accuracy and reliability	Frequent breakdowns	Very reliable and accurate
Efficiency (power and heat)	Huge power use, lots of heat	Low power – runs on a battery
Cost	Extremely expensive	Affordable for homes and students

4. Today's trends (2026 syllabus)

NEW 2026 The 2026 syllabus asks you to know modern technology students use every day. Older devices like floppy disks are only history now.

Smartphones and tablets
A full computer in your pocket, with Android or iOS.

AI everywhere
Voice assistants, translation, photo enhancement, chatbots.

Cloud computing
Files and apps on the Internet – Google Drive, Microsoft 365.

IoT and wearables
Smart watches, smart TVs, smart home devices.

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SSD storage
Solid State Drives have no moving parts – faster and tougher than hard disks.

Fast networks
4G/5G, Wi-Fi 6 and fibre connect devices quickly.

Key Words

Abacus – An ancient counting frame with beads.

Charles Babbage – Designed the Analytical Engine; called the Father of the Computer.

Ada Lovelace – Considered the first computer programmer.

Punched card – A card with holes used to give instructions or data to machines.

Computer generation – A stage of computer history based on the main processor technology.

Vacuum tube – Glass tube used as a switch in 1st-generation computers.

Transistor – A small electronic switch used from the 2nd generation.

Integrated Circuit (IC) – Many transistors on one small silicon chip (3rd generation).

Microprocessor – A whole CPU on one chip (4th generation).

VLSI – Very Large Scale Integration – millions of transistors on one chip.

ENIAC – An early 1st-generation electronic computer (1946).

SSD – Solid State Drive – fast storage with no moving parts.

Sample Q&A

1. What was the abacus used for?

> **Answer:** For counting, adding and subtracting by moving beads on rods.

2. Why is Charles Babbage called the Father of the Computer?

> **Answer:** His Analytical Engine design had input, memory (store), a processing unit and output – the same main parts as a modern computer.

3. What technology was used in first-generation computers?

> **Answer:** Vacuum tubes. That is why they were huge, hot and used a lot of electricity.

4. What is a microprocessor?

> **Answer:** A single chip that contains the whole CPU. It started the 4th generation (Intel 4004, 1971).

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5. What is special about fifth-generation computers?

> **Answer:** They use Artificial Intelligence – they can understand speech, recognise images and learn from data.

6. Why is an SSD better than an old hard disk?

> **Answer:** An SSD has no moving parts, so it is faster, quieter and less likely to break if dropped.

MCQ

1. Which is the oldest calculating device?

A. Abacus
B. Smartphone
C. Pascaline
D. ENIAC

2. The Pascaline (1642) could mainly:

A. Print colour photos
B. Browse the Internet
C. Add and subtract using gears
D. Recognise faces

3. Napier's Bones were used to help with:

A. Multiplication
B. Storing photos
C. Sending emails
D. Weaving cloth

4. Punched cards were first used to control patterns in the:

A. Abacus
B. Jacquard loom
C. Smartphone
D. Vacuum tube

5. Who is known as the "Father of the Computer"?

A. Herman Hollerith
B. John Napier
C. Charles Babbage
D. Blaise Pascal

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6. Who is considered the first computer programmer?

A. Blaise Pascal
B. Charles Babbage
C. Joseph Jacquard
D. Ada Lovelace

7. First-generation computers used:

A. Transistors
B. Microprocessors
C. Vacuum tubes
D. AI chips

8. Which was a problem of first-generation computers?

A. They were too small to see
B. They had touch screens
C. They used very little power
D. They produced a lot of heat

9. Second-generation computers replaced vacuum tubes with:

A. Gears
B. Transistors
C. Beads
D. Integrated circuits

10. Many transistors placed on one small chip is called a(n):

A. Integrated Circuit (IC)
B. Vacuum tube
C. Abacus
D. Punched card

11. The microprocessor (whole CPU on one chip) belongs to the:

A. First generation
B. Fourth generation
C. Second generation
D. Third generation

12. VLSI stands for:

A. Very Low Speed Internet
B. Variable Light Sensor Input
C. Very Large Scale Integration
D. Visual Language System Interface

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13. Which feature mainly describes fifth-generation computers?

A. Artificial Intelligence
B. Gear wheels
C. Vacuum tubes
D. Punched cards only

14. As computers developed from generation to generation, they became:

A. Bigger and slower
B. Hotter and less reliable
C. More expensive and heavier
D. Smaller, faster and cheaper

15. Which modern storage device has no moving parts?

A. Floppy disk drive
B. SSD (Solid State Drive)
C. Hard disk drive
D. Magnetic tape drive

Structured Questions

1. (i) Name two early calculating devices and the person who made each. (4 marks)
(ii) What was the main use of the abacus? (1 mark) *(5 marks)*

> (i) Any two: Napier's Bones – John Napier; Pascaline – Blaise Pascal; Analytical Engine – Charles Babbage; Jacquard loom – Joseph Jacquard; Tabulating machine – Herman Hollerith.
> (ii) Counting / adding and subtracting with beads.

2. (i) Why is Charles Babbage called the "Father of the Computer"? (2 marks)
(ii) What was Ada Lovelace's contribution? (2 marks) *(4 marks)*

> (i) He designed the Analytical Engine, which had input, a store (memory), a mill (processing unit) and output – the basic parts of a modern computer.
> (ii) She wrote instructions (an algorithm) for the Analytical Engine, so she is called the first computer programmer.

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3. Copy and complete the table.
| Generation | Main technology |
| 1st | ..... |
| 2nd | ..... |
| 3rd | ..... |
| 4th | ..... |
| 5th | ..... | (5 marks) *(5 marks)*

> 1st – vacuum tubes; 2nd – transistors; 3rd – integrated circuits (ICs); 4th – microprocessors (LSI/VLSI); 5th – artificial intelligence (ULSI, parallel processing).

4. (i) Write two disadvantages of first-generation computers. (2 marks)
(ii) Write two advantages of transistors over vacuum tubes. (2 marks) *(4 marks)*

> (i) Very large size; produced a lot of heat; used a lot of electricity; broke down often; very expensive (any two).
> (ii) Smaller; faster; less heat; less power; more reliable; cheaper (any two).

5. Computers improved in size, speed, capacity, accuracy and efficiency.
(i) Explain how any three of these changed from the 1st generation to today. (3 marks)
(ii) What is a microprocessor? (2 marks) *(5 marks)*

> (i) Size: from room-size to pocket-size. Speed: from thousands to billions of operations per second. Capacity: from tiny memory to gigabytes/terabytes. Accuracy: from frequent errors to very reliable. Efficiency: from huge power use to battery power (any three).
> (ii) A single integrated-circuit chip that contains the whole CPU (e.g. Intel 4004, 1971).

6. (i) Write two features of fifth-generation computers. (2 marks)
(ii) Name three modern computing trends that students use today. (3 marks) *(5 marks)*

> (i) Use of artificial intelligence; understand natural language (speech); recognise images; parallel processing; ULSI chips (any two).
> (ii) Any three: smartphones/tablets, cloud computing (Google Drive, Microsoft 365), AI assistants/chatbots, IoT and wearables, SSD storage, 4G/5G and Wi-Fi 6.

Summary

- Early devices: abacus, Napier’s Bones, Pascaline, Jacquard loom, Babbage’s engines, Hollerith’s tabulator.
- Charles Babbage is the Father of the Computer; Ada Lovelace was the first programmer.
- Generations are based on processor technology: vacuum tubes → transistors → ICs → microprocessors → AI.
- LSI and VLSI put thousands to millions of transistors on one chip.

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- Each generation became smaller, faster, more accurate, more efficient, with more capacity and lower cost.
- The 5th generation uses AI: understanding speech and images and learning from data.
- Today’s trends: smartphones, cloud, IoT and wearables, SSDs, 4G/5G and Wi-Fi 6.

MCQ answer key – 1.3

1. **A** – The abacus was used thousands of years ago.
2. **C** – Pascal’s machine was a mechanical adding machine.
3. **A** – Napier’s numbered rods made multiplication easier.
4. **B** – Jacquard’s loom (1804) used punched cards – like a program.
5. **C** – Babbage designed the Analytical Engine with the parts of a modern computer.
6. **D** – Ada Lovelace wrote steps (an algorithm) for the Analytical Engine.
7. **C** – 1st generation = vacuum tubes (e.g. ENIAC).
8. **D** – Vacuum tubes got very hot and used a lot of power.
9. **B** – Transistors were smaller, cooler and more reliable.
10. **A** – ICs started the 3rd generation.
11. **B** – Intel 4004 (1971) began the 4th generation.
12. **C** – VLSI chips hold millions of transistors.
13. **A** – 5th generation focuses on AI, learning and natural language.
14. **D** – Size and cost went down; speed, capacity and reliability went up.
15. **B** – SSDs use flash memory chips, so they are fast and tough.

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