Grade 12 A/L ICT

Lesson 1: Concept of ICT

- 1.1 Data and Information: Life Cycle, Value and Big Data
- 1.2 Why We Need Technology for Information: Uses, Manual Methods and the ICT Era
- 1.3 The Input–Process–Output Model and Systems
- 1.4 Components of a Computer System: Hardware, Software and People
- 1.5 Data Processing: Gathering, Validation, Processing, Output and Storage
- 1.6 Applications of ICT in Different Domains
- 1.7 Impact of ICT on Society: Benefits, Issues and the Digital Divide

© 2026 schoolict.net (Ruwan Mangala Suraweera)
All rights reserved.

Grade 12 A/L ICT · Lesson 1

1.1 Data and Information: Life Cycle, Value and Big Data

Syllabus 1.1. Everything in ICT starts with **data**. Data are raw facts, like numbers, words, pictures or sounds. When we **process** data, we get **information** – something that has meaning and helps us decide. In this part you learn the life cycle of data, the difference between data and information, what makes information valuable, and why we now need special tools for **big data**.

1. What are data?

Data are raw, unprocessed facts and figures. On their own they have little meaning. Example: 72, 85, 64 – we do not know what these numbers are.

Form of data	Example	Characteristic
Numeric	Marks, prices, temperature	Can be calculated
Text (alphanumeric)	Names, addresses	Letters, digits and symbols
Image	Photos, X-rays	Made of pixels
Audio	Voice, music	Sound waves stored digitally
Video	CCTV, lessons	Many images plus sound

2. Life cycle of data

Data have a life, just like a living thing. They are **created**, then **managed** (stored, used, shared, protected and updated), and finally old data that are no longer useful are **removed** (obsolete data).



Life cycle of data: creation, management and removal of obsolete data.

Data creation
New data are typed, scanned, sensed or recorded. E.g. a new student is registered.

Management
Data are stored, backed up, kept correct, kept secure and shared with the right people.

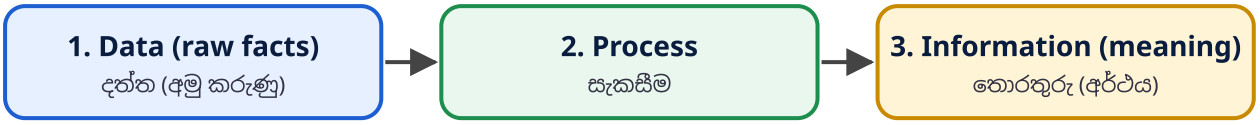
© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

Removal of obsolete data
Data that are out of date are deleted or archived safely. E.g. records of students who left 20 years ago.

💡 Think of milk: it is produced (creation), kept in a fridge and used (management), and thrown away after the expiry date (removal). Old data are like expired milk – they can give wrong answers.

3. Data, process and information

Information is processed data that is meaningful and useful for making decisions. We always need a **process** (such as sorting, calculating, comparing or summarising) to change data into information. So data, process and information are strongly linked: no data – no information; no process – no information.



Data become information through a process.

🧱 **Worked example: Marks 72, 85 and 64 (data) → find the average (process) → information**
Average = (72 + 85 + 64) ÷ 3 = 221 ÷ 3 = **73.67**. Using the grade scale (A 75+, B 65–74, C 50–64, S 35–49, W below 35) the student gets **B**. Now the numbers have meaning: "this student's average is a B pass".

Data	Information
Raw, unprocessed facts	Processed, organised facts
Little meaning on its own	Has meaning in a context
Input to a process	Output of a process
E.g. 36.9, 38.5, 39.1	E.g. "The patient's fever is rising"

💡 Information produced by one process can become data for another process. A class average (information for the teacher) becomes data when the principal compares all classes.

4. Quality data

Good information needs good data ("garbage in, garbage out"). Quality data are **accurate** (correct), **complete** (nothing missing), **consistent** (the same everywhere), **up to date**, **relevant** to

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

the purpose, and **valid** (in the correct format and range).

5. Characteristics of valuable information



Five characteristics of valuable information in the syllabus.

Characteristic	Meaning	Example
Timeliness	Available when it is needed	A flood warning before the flood, not after
Accuracy	Free from errors	The correct balance in a bank account
Presented within the context	Related to the user's situation and purpose	"30" means little; "30 °C in Colombo now" is clear
Enhanced understandability	Easy to understand, e.g. by charts	A bar chart of monthly sales
Less uncertainty	Reduces doubt when deciding	A weather forecast helps a farmer decide when to plant

The **value of information** is how much it helps us make a better decision. Example: a fisherman who gets an accurate storm warning in time saves his boat and his life – that information is very valuable. The same warning one day late has no value.

6. Big data – large volumes and complexities of data

Today phones, sensors, social media, shops and banks create huge amounts of data every second. **Big data** means data sets that are so large, so fast and so varied that normal software cannot store or analyse them easily. We need special tools (many computers working together, cloud storage, data analytics) to find useful patterns.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved



The Vs of big data.

- **Volume** – the amount is huge (terabytes and more).
- **Velocity** – data arrive very fast, often every second.
- **Variety** – many types: text, images, video, sensor readings.
- **Veracity** – some data may be wrong or doubtful, so they must be checked.
- **Value** – the useful information we finally get from the data.

🧱 **Worked example: How much data do 1,000 sensors create in one day if each sends a 4-byte reading every second?**
Seconds in a day = 24 × 60 × 60 = 86,400. Bytes = 1,000 × 4 × 86,400 = **345,600,000 bytes** = **345.6 MB** (1 MB = 1,000,000 bytes). In one year this becomes far more – this is why big data needs special storage.

Big data analysis examples: supermarkets find which goods are bought together, the weather department predicts rain, hospitals spot disease outbreaks, and banks detect unusual card payments (fraud).

🚀 **Beyond the syllabus (2026 update)** *Not required for the exam – read for interest.* **AI analytics.** In 2026 most big data is analysed with artificial intelligence and machine learning. The computer learns patterns from millions of past records and then predicts – for example, which customers may leave a mobile network, or which roads will have traffic jams. Data engineers and data scientists are among the fastest-growing jobs.

Key Words

Data – Raw, unprocessed facts and figures.	**Information** – Processed data that is meaningful and useful for decisions.
Process – Actions such as sorting or calculating that change data into information.	**Life cycle of data** – The stages of creation, management and removal of data.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

Obsolete data – Old data that are no longer useful or correct.

Timeliness – Information is available at the time it is needed.

Accuracy – Information is correct and free from errors.

Context – The situation that gives information its meaning.

Uncertainty – Doubt about what will happen or what to decide.

Quality data – Data that are accurate, complete, consistent and up to date.

Big data – Data sets too large, fast and varied for normal software.

Velocity – The speed at which new data arrive.

Variety – The many different types of data, such as text and video.

Sample Q&A

1. Define data and information.

> **Answer:** Data are raw, unprocessed facts. Information is data that has been processed so that it is meaningful and useful for decisions.

2. Name the three stages of the life cycle of data.

> **Answer:** Data creation, management, and removal of obsolete data.

3. Why do we need a process to get information?

> **Answer:** Raw data alone have little meaning. A process such as sorting, calculating or summarising organises the data and gives them meaning.

4. List the five characteristics of valuable information given in the syllabus.

> **Answer:** Timeliness, accuracy, presented within the context, enhanced understandability and less uncertainty.

5. What is big data? Give one use.

> **Answer:** Data sets so large, fast and varied that normal software cannot handle them easily. Use: a bank analyses card payments to detect fraud.

6. Why should obsolete data be removed?

> **Answer:** They waste storage, slow down searches, can give wrong results and may break privacy rules if kept too long.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

MCQ

1. Which of these is data, not information?

A. Sales fell by 10% this month
B. The patient’s fever is rising
C. The numbers 36.9, 38.5, 39.1
D. Class average is 62
E. Nimal got grade B

2. Which stage of the life cycle of data includes backing up and updating?

A. Output
B. Validation only
C. Creation
D. Removal
E. Management

3. A flood warning that arrives after the flood fails mainly in:

A. Timeliness
B. Context
C. Accuracy
D. Volume
E. Variety

4. The average of 72, 85 and 64 is:

A. 71.5
B. 74.33
C. 85
D. 73.67
E. 221

5. Changing “30” into “30 °C in Colombo now” improves:

A. Obsolescence
B. Volume
C. Presentation within the context
D. Velocity
E. Data creation

6. Which V of big data is about the speed at which data arrive?

A. Veracity
B. Velocity
C. Variety
D. Value
E. Volume

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

7. 1,000 sensors each send 4 bytes every second. Data per day?

A. 345.6 MB
B. 3,456 MB
C. 4 MB
D. 86.4 MB
E. 5.76 MB

8. “Garbage in, garbage out” means:

A. Output is always correct
B. Computers make waste
C. Poor data give poor information
D. Data need no checking
E. Delete all old files

9. Which is NOT a characteristic of quality data?

A. Accurate
B. Consistent
C. Complete
D. Up to date
E. Duplicated in many places

10. A weather forecast helps a farmer decide when to plant. This shows information:

A. Has no value
B. Reduces uncertainty
C. Is always obsolete
D. Is raw data
E. Increases volume

11. Information from one process can be:

A. A process itself
B. Never used again
C. Only printed
D. Hardware
E. Data for another process

12. Which form of data is made of pixels?

A. Text
B. Audio
C. Sensor time
D. Image
E. Numeric

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

13. Which term means: “Raw, unprocessed facts and figures”?

A. Context
B. Big data
C. Process
D. Data
E. Timeliness

14. Which term means: “Processed data that is meaningful and useful for decisions”?

A. Information
B. Uncertainty
C. Accuracy
D. Life cycle of data
E. Velocity

15. Which term means: “Actions such as sorting or calculating that change data into information”?

A. Process
B. Variety
C. Quality data
D. Context
E. Obsolete data

16. Which term means: “The stages of creation, management and removal of data”?

A. Uncertainty
B. Big data
C. Data
D. Timeliness
E. Life cycle of data

17. Which term means: “Old data that are no longer useful or correct”?

A. Accuracy
B. Obsolete data
C. Velocity
D. Information
E. Quality data

18. Which term means: “Information is available at the time it is needed”?

A. Context
B. Process
C. Timeliness
D. Big data
E. Variety

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

19. Which term means: “Information is correct and free from errors”?

A. Data
B. Accuracy
C. Velocity
D. Uncertainty
E. Life cycle of data

20. Which term means: “The situation that gives information its meaning”?

A. Obsolete data
B. Information
C. Variety
D. Context
E. Quality data

Structured Questions

1. (a) Define data. (b) Define information. (c) Give one example that shows data becoming information. *(3 marks)*

> (a) Raw unprocessed facts; (b) processed data that is meaningful; (c) marks 72, 85, 64 averaged to 73.67, grade B

2. Describe the life cycle of data using a school student record. *(3 marks)*

> Creation: the student’s details are entered at admission; management: the record is stored, updated each year, backed up and kept secure; removal: after the student leaves and the retention time ends, the record is archived or deleted

3. Explain three characteristics of valuable information with an example for each. *(3 marks)*

> Timeliness – a cyclone warning given a day before; accuracy – correct exam results; less uncertainty – a sales report helps a shop decide how much to order

4. A city has 1,000 traffic sensors. Each sends 4 bytes every second. (a) Calculate the data per day in MB. (b) Name two Vs of big data shown here. *(3 marks)*

> (a) 1000 × 4 × 86,400 = 345,600,000 bytes = 345.6 MB; (b) volume (large amount); velocity (every second)

5. Explain why the relationship between data, process and information is strong. *(3 marks)*

> Information cannot exist without data; data give no meaning without a process; the quality of information depends on the quality of data and the correctness of the process

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

Summary

- Data are raw facts; information is processed, meaningful data.
- Life cycle: creation → management → removal of obsolete data.
- A process is always needed to turn data into information.
- Valuable information: timely, accurate, in context, understandable, less uncertain.
- Big data: huge volume, high velocity, wide variety – needs special tools.
- Quality data are accurate, complete, consistent and up to date.

MCQ answer key – 1.1

1. **C** – Bare numbers with no meaning are data.
2. **E** – Storing, backing up, updating and sharing are management.
3. **A** – It was not available when it was needed.
4. **D** – 221 ÷ 3 = 73.67.
5. **C** – Context gives the number meaning.
6. **B** – Velocity means speed.
7. **A** – 1000 × 4 × 86,400 = 345,600,000 bytes.
8. **C** – Quality of output depends on quality of input.
9. **E** – Duplication causes inconsistency.
10. **B** – Valuable information reduces doubt.
11. **E** – Output of one process may be input of the next.
12. **D** – Images are grids of pixels.
13. **D** – Data – Raw, unprocessed facts and figures.
14. **A** – Information – Processed data that is meaningful and useful for decisions.
15. **A** – Process – Actions such as sorting or calculating that change data into information.
16. **E** – Life cycle of data – The stages of creation, management and removal of data.
17. **B** – Obsolete data – Old data that are no longer useful or correct.
18. **C** – Timeliness – Information is available at the time it is needed.
19. **B** – Accuracy – Information is correct and free from errors.
20. **D** – Context – The situation that gives information its meaning.

© 2026 schoolict.net (Ruwan Mangala Suraweera). All rights reserved.

Grade 12 A/L ICT · Lesson 1

1.2 Why We Need Technology for Information: Uses, Manual Methods and the ICT Era

Syllabus 1.2. People use information every day to decide, plan and predict. In the past this was done by hand with paper files, which was slow and full of mistakes. ICT solves many of these problems. In this part you learn how information is used, the drawbacks of manual methods, and how computer networks, the Internet, the WWW, mobile communication and cloud computing developed.

1. Information in day to day life



Information helps in many daily activities.

Use	Meaning	Example
Decision making	Choosing the best option	A student chooses a university course using Z-score cut-offs
Policy making	Making rules for a country or organisation	Government uses census data to plan schools
Predictions	Saying what may happen in future	Weather forecasts, dengue outbreak warnings
Planning	Deciding what to do and how	A farmer plans crops by the rain season
Scheduling	Fixing times for tasks	Train and bus timetables, exam timetables
Monitoring	Checking progress against a plan	A hospital monitors a patient's heart rate

2. Drawbacks of manual methods

Manual methods mean handling data by hand using paper, registers and files. They have these problems:

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

- **Inconsistency** – the same fact is different in two files (one says 17 years, another says 18).
- **Duplication** – the same data is written again and again in many registers.
- **Room for errors and human errors** – tired people make mistakes in writing and adding.
- **Delay in processing** – finding and calculating by hand takes a long time.
- **Lack of sharing information** – a paper file can be in only one place at a time.
- **Reduced customer services** – customers wait in long queues.

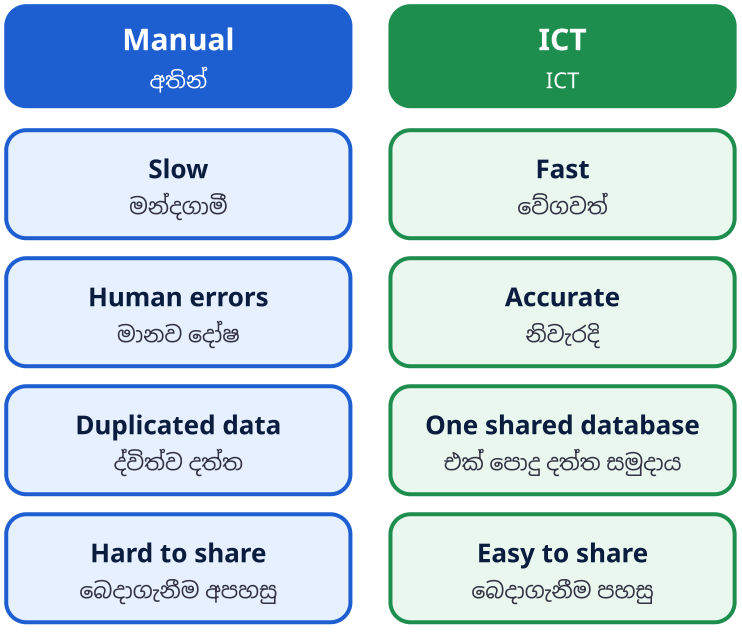
> 🧮 **Worked example: A clerk processes 1,000 forms at 25 forms per hour with 2 errors per 100 forms. A computer processes 500 forms per minute.**
> Clerk time = 1,000 ÷ 25 = **40 hours**. Expected errors = 1,000 × 2 ÷ 100 = **20 forms with errors**. Computer time = 1,000 ÷ 500 = **2 minutes**. ICT is much faster and, with validation, makes far fewer errors.

3. When manual methods are harmful to humans

Some work is **infeasible** (not possible or not safe) for people. Machines controlled by ICT do it instead, and this protects the **safety of human operators**: measuring radiation inside a nuclear plant, exploring deep sea or space, defusing bombs, spraying chemicals, working inside very hot furnaces, or checking gas leaks in mines.

4. The emergence of the ICT era

ICT (Information and Communication Technology) joins computers (to process and store) with communication (to send and share). ICT overcomes the drawbacks of manual methods:



Manual methods compared with ICT methods.

Manual problem	ICT solution

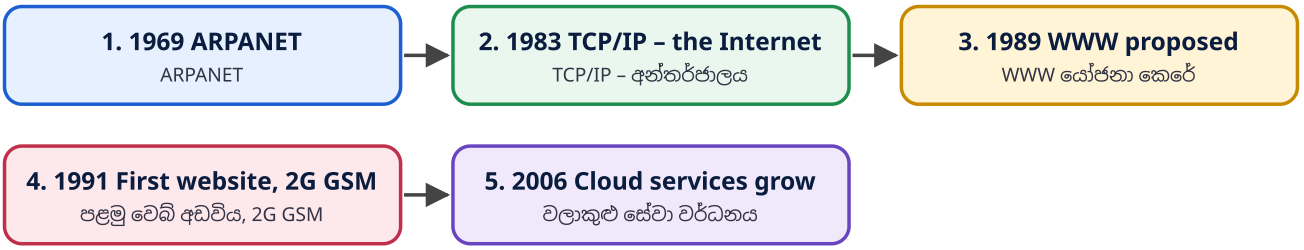
© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

Duplication and inconsistency	One central database used by everyone
Human errors	Validation checks and automatic calculation
Delay	Fast processing and instant search
Poor sharing	Networks, e-mail and the cloud
Poor customer service	Online services 24 hours a day

5. Technologies for retrieving and sharing information

Today we can **retrieve** (find and get) and **share** information using search engines, websites, e-mail, social media, online databases, digital libraries, video calls, SMS, file sharing and cloud storage such as online drives.

6. Networks, the Internet and the WWW



Key steps in the growth of networks and the Internet.

- **Computer network** – two or more computers connected to share data and resources (printers, files).
- **ARPANET (1969)** – an early US research network; the start of the Internet idea.
- **The Internet** – a worldwide “network of networks”. ARPANET switched to the TCP/IP protocols in 1983.
- **World Wide Web (WWW)** – web pages linked by hyperlinks, proposed by **Tim Berners-Lee** at CERN in 1989; the first website went online in 1991.
- The Internet is the network (roads); the WWW is one service on it (the shops on the roads). E-mail is another service.

7. Mobile communication, mobile computing and cloud computing

Generation	Main feature
1G (1980s)	Analogue voice calls only
2G (1990s, GSM)	Digital voice and SMS
3G (2000s)	Mobile Internet and video calls
4G (2010s, LTE)	Fast broadband, HD video streaming
5G (2019 onward)	Very high speed, very low delay, many IoT devices

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

Mobile computing means using computing devices (smartphones, tablets, laptops) while moving, connected by wireless networks. **Cloud computing** means using computing resources (storage, software, processing power) over the Internet from a service provider, paying only for what you use. Main cloud service models: **SaaS** (software, e.g. online office apps), **PaaS** (a platform to build apps) and **IaaS** (virtual servers and storage).

> 💡 Cloud is like using the electricity grid: you do not build your own power station, you just plug in and pay for what you use.

8. Information in various domains

Every field uses information: banks (account balances), hospitals (patient records), schools (results), transport (timetables), agriculture (weather and prices), government (census). Part 1.6 studies these domains in detail.

> 🚀 **Beyond the syllabus (2026 update)** *Not required for the exam – read for interest.* **5G and edge cloud.** 5G networks give speeds of over 1 Gbps and delays of a few milliseconds. With **edge computing**, small cloud servers are placed near users, so self-driving cars, remote surgery robots and smart factories can react almost instantly. Satellite Internet constellations also bring broadband to remote areas.

Key Words

Decision making – Choosing the best option using information.

Policy making – Making rules and plans for a country or organisation.

Prediction – Saying what may happen in future using past data.

Monitoring – Checking progress or condition against a plan.

Manual method – Handling data by hand with paper and files.

Inconsistency – The same fact has different values in different places.

Duplication – The same data stored again in more than one place.

Computer network – Connected computers that share data and resources.

Internet – A worldwide network of networks using TCP/IP.

World Wide Web – A service of linked web pages on the Internet.

Mobile computing – Using computing devices while moving, through wireless networks.

Cloud computing – Using storage, software and processing over the Internet and paying for use.

SaaS – Software as a Service: ready software used online.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

Sample Q&A

1. List four ways information is used in day to day life.

> **Answer:** Decision making, policy making, predictions, and planning, scheduling and monitoring.

2. Give three drawbacks of manual data processing.

> **Answer:** Duplication and inconsistency of data, human errors, and delay in processing (also poor sharing and reduced customer service).

3. Give one situation where manual methods are harmful to humans.

> **Answer:** Measuring radiation in a nuclear plant – a robot or sensor is used so that no person is exposed.

4. What is the difference between the Internet and the WWW?

> **Answer:** The Internet is the worldwide network of networks. The WWW is a service on the Internet made of linked web pages.

5. What is cloud computing? Name its three service models.

> **Answer:** Using computing resources over the Internet from a provider and paying for use. SaaS, PaaS and IaaS.

6. Which mobile generation first gave SMS?

> **Answer:** 2G (digital GSM).

MCQ

1. Using census data to decide where to build new schools is an example of:

A. Policy making
B. Data creation
C. Monitoring only
D. Scheduling a train
E. Data removal

2. A student's age is 17 in one register and 18 in another. This problem is:

A. Velocity
B. Inconsistency
C. Validation
D. Cloud computing
E. Timeliness

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

3. A clerk does 25 forms per hour. Time for 1,000 forms?

A. 40 hours
B. 400 hours
C. 2 hours
D. 4 hours
E. 25 hours

4. With 2 errors per 100 forms, how many of 1,000 forms may have errors?

A. 200
B. 10
C. 20
D. 50
E. 2

5. Who proposed the World Wide Web in 1989?

A. Charles Babbage
B. Tim Berners-Lee
C. Bill Gates
D. Alan Turing
E. Steve Jobs

6. ARPANET, the early network that led to the Internet, started in:

A. 1989
B. 2006
C. 1991
D. 1969
E. 1945

7. The Internet is best described as:

A. A worldwide network of networks
B. A search engine
C. A single web page
D. A word processor
E. Only e-mail

8. Online office apps used through a browser are an example of:

A. IaaS
B. A LAN cable
C. 1G
D. PaaS
E. SaaS

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

9. Which generation introduced mobile Internet and video calls?

A. 3G
B. Landline
C. Telegraph
D. 2G
E. 1G

10. Why are robots used to defuse bombs?

A. For scheduling
B. The manual method is harmful to humans
C. To create big data
D. Robots are cheaper than paper
E. To remove obsolete data

11. Which ICT feature solves duplication of data?

A. More paper files
B. Faster typing
C. A bigger monitor
D. A central shared database
E. A 1G phone

12. Using a laptop on a train with a mobile data connection is:

A. Batch processing
B. Manual method
C. Policy making
D. Data removal
E. Mobile computing

13. Which term means: “Choosing the best option using information”?

A. Prediction
B. Inconsistency
C. Mobile computing
D. Computer network
E. Decision making

14. Which term means: “Making rules and plans for a country or organisation”?

A. Duplication
B. Policy making
C. Cloud computing
D. Monitoring
E. Internet

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

15. Which term means: “Saying what may happen in future using past data”?

A. Computer network
B. SaaS
C. Manual method
D. Prediction
E. World Wide Web

16. Which term means: “Checking progress or condition against a plan”?

A. Inconsistency
B. Mobile computing
C. Monitoring
D. Internet
E. Decision making

17. Which term means: “Handling data by hand with paper and files”?

A. World Wide Web
B. Policy making
C. Cloud computing
D. Manual method
E. Duplication

18. Which term means: “The same fact has different values in different places”?

A. Prediction
B. Mobile computing
C. Inconsistency
D. Computer network
E. SaaS

19. Which term means: “The same data stored again in more than one place”?

A. Internet
B. Decision making
C. Duplication
D. Monitoring
E. Cloud computing

20. Which term means: “Connected computers that share data and resources”?

A. Policy making
B. Manual method
C. World Wide Web
D. SaaS
E. Computer network

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

Structured Questions

1. Explain how information is used for (a) predictions, (b) scheduling and (c) monitoring, with an example for each. *(3 marks)*

> (a) past rainfall data predict floods; (b) a school makes an exam timetable; (c) a hospital monitors heart rate and gives alarms

2. A clerk processes 1,000 forms at 25 per hour, with 2 errors per 100 forms. A computer does 500 per minute. (a) Find the clerk's time. (b) Find the expected errors. (c) Find the computer's time. *(3 marks)*

> (a) 1000 ÷ 25 = 40 hours; (b) 1000 × 2 ÷ 100 = 20 forms; (c) 1000 ÷ 500 = 2 minutes

3. Describe four drawbacks of manual methods and say how ICT overcomes each. *(4 marks)*

> Duplication – one shared database; human errors – validation and automatic calculation; delay – fast processing and search; poor sharing – networks and the cloud

4. Outline the development from ARPANET to the WWW. *(4 marks)*

> ARPANET started in 1969 as a research network; it moved to TCP/IP in 1983, forming the Internet; Tim Berners-Lee proposed the WWW in 1989; the first website went online in 1991

5. (a) Define cloud computing. (b) Give two advantages and one disadvantage. *(4 marks)*

> (a) Using computing resources over the Internet from a provider, paying for use; (b) access from anywhere; no need to buy servers; disadvantage – needs a reliable Internet connection and data are held by another company

Summary

- Information is used for decisions, policies, predictions, planning, scheduling and monitoring.
- Manual methods cause duplication, inconsistency, errors, delay and poor sharing.
- ICT machines do work that is harmful to humans.
- ARPANET 1969 → TCP/IP Internet 1983 → WWW 1989.
- Mobile generations 1G to 5G; cloud models SaaS, PaaS, IaaS.

MCQ answer key – 1.2

1. **A** – Government rules and plans are policies.
2. **B** – Different values for the same fact.
3. **A** – 1000 ÷ 25 = 40.
4. **C** – 1000 × 2 ÷ 100 = 20.
5. **B** – He worked at CERN.
6. **D** – ARPANET began in 1969.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

7. **A** – Many networks joined by TCP/IP.
8. **E** – Ready software as a service.
9. **A** – 3G brought mobile data.
10. **B** – Safety of human operators.
11. **D** – Data are stored once and shared.
12. **E** – Computing while moving.
13. **E** – Decision making – Choosing the best option using information.
14. **B** – Policy making – Making rules and plans for a country or organisation.
15. **D** – Prediction – Saying what may happen in future using past data.
16. **C** – Monitoring – Checking progress or condition against a plan.
17. **D** – Manual method – Handling data by hand with paper and files.
18. **C** – Inconsistency – The same fact has different values in different places.
19. **C** – Duplication – The same data stored again in more than one place.
20. **E** – Computer network – Connected computers that share data and resources.

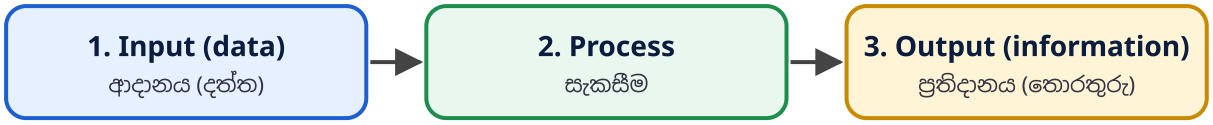
© 2026 schoolict.net (Ruwan Mangala Suraweera). All rights reserved.

Grade 12 A/L ICT · Lesson 1

1.3 The Input–Process–Output Model and Systems

Syllabus 1.3. Every kind of information is made in the same simple way: we take something in (**input**), do something to it (**process**) and give something out (**output**). This is the **abstract model of information creation**, also called the **IPO model**. In this part you use it to define a **system**, study real systems, and match it to the main functions of a computer.

1. The abstract model of information creation



Storage and feedback support every step

Input → Process → Output.

Input
The data that go into the model.

Process
The actions that change data (calculate, sort, compare).

Output
The information that comes out.

“Abstract” means we keep only the main idea and hide the details. The same three boxes describe a calculator, a school report system or a cash register.

> 🧱 **Worked example: Apply the IPO model to a student’s marks**
> **Input:** 72, 85, 64. **Process:** add them (221) and divide by 3; compare with the grade scale.
> **Output:** average **73.67**, grade **B**.

2. What is a system?

A **system** is a set of related parts (components) that work together to achieve a common goal, by taking inputs, processing them and producing outputs. A system has a **boundary** (what is inside it) and an **environment** (what is outside it). Many systems also have **feedback** – some output is sent back to control the input or process – and **storage**.

System	Input	Process	Output	Goal
ATM	Card, PIN, amount	Check PIN and balance	Cash, receipt	Give cash safely

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

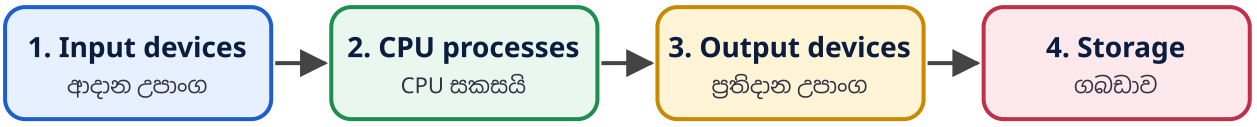
Supermarket POS	Bar codes	Find prices, add total	Bill	Sell goods quickly
Human digestive system	Food	Digestion	Energy, waste	Keep the body alive
Air conditioner	Room temperature	Compare with set value	Cool air	Keep the room at 24 °C

> 💡 An air conditioner shows feedback: the output (cooler room) is measured again and becomes new input, so the machine knows when to stop.

3. Information systems

An **information system** is a system whose input is data and whose output is information. Its components are hardware, software, data, procedures and people. Example: a school examination system – input: marks; process: totals, averages, ranks; output: report cards.

4. The model and the computer



The main functions of a computer follow the same model.

Model part	Computer function	Devices
Input	Accept data	Keyboard, mouse, scanner, sensors
Process	Process data (ALU and CU)	CPU
Output	Produce information	Monitor, printer, speaker
Storage	Store data and programs	RAM, SSD, hard disk

5. The role of ICT in the model

- **Input** – ICT collects data automatically (bar codes, sensors, online forms).
- **Process** – the computer processes very fast and accurately.
- **Output** – information is shown on screens, printed, or sent over networks at once.
- **Storage and communication** – data are kept safely and shared with many users.

🚀 **Beyond the syllabus (2026 update)** *Not required for the exam – read for interest.* **Generative AI in the IPO model.** A chatbot also fits the model: input = your prompt; process = a large language model predicts words using billions of learned values; output = generated text, images or code. Because the process is statistical, the output can be wrong (a “hallucination”), so it must always be checked.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

Key Words

Input – Data that enter a system.	**Process** – Actions that change inputs into outputs.
Output – Results that leave a system.	**Abstract model** – A simple model that shows the main idea and hides details.
System – Related parts working together to reach a common goal.	**Boundary** – The line that separates a system from its environment.
Environment – Everything outside a system that affects it.	**Feedback** – Output sent back to control the input or process.
Information system – A system that turns data into information.	**CPU** – The part of a computer that processes data.
Storage – Keeping data and programs for later use.	**Component** – One part of a system.

Sample Q&A

1. Name the three parts of the abstract model of information creation.

> **Answer:** Input, process and output.

2. Define a system.

> **Answer:** A set of related components working together to achieve a common goal by taking inputs, processing them and giving outputs.

3. What is feedback? Give an example.

> **Answer:** Output sent back to control the system. Example: a thermostat measures the room temperature it produced and switches the cooler off.

4. Match the IPO model to computer functions.

> **Answer:** Input devices accept data, the CPU processes it, output devices give information, and storage devices keep data.

5. Give the input, process and output of an ATM.

> **Answer:** Input: card, PIN, amount. Process: check PIN and balance, update the account. Output: cash and receipt.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

6. What is an information system?

> **Answer:** A system that takes data as input and produces information as output, using hardware, software, data, procedures and people.

MCQ

1. In a supermarket POS, scanning bar codes is the:

A. Process
B. Input
C. Feedback
D. Output
E. Environment

2. Calculating a bill total is the:

A. Output
B. Input
C. Process
D. Storage
E. Boundary

3. Marks 72, 85, 64 are processed. The output average is:

A. 74.33
B. 221
C. 72
D. 73.67
E. 64

4. With A 75+, B 65–74, C 50–64, what grade is an average of 73.67?

A. C
B. B
C. S
D. W
E. A

5. Which part of the computer matches “process” in the IPO model?

A. Keyboard
B. Printer
C. Speaker
D. Monitor
E. CPU

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

6. A thermostat switching off the cooler when the room reaches 24 °C shows:

A. Obsolete data
B. Piracy
C. Batch processing
D. Duplication
E. Feedback

7. Everything outside a system that affects it is the:

A. Environment
B. Component
C. Boundary
D. Output
E. Process

8. Which is the best definition of a system?

A. A printed report
B. Any single computer
C. Related parts working together for a common goal
D. A list of data
E. Only software

9. “Abstract” in the abstract model means:

A. Showing the main idea and hiding details
B. Hand drawn
C. Only for computers
D. Very detailed
E. Impossible to use

10. A report card printed by a school system is:

A. Input (data)
B. Output (information)
C. Boundary
D. Process
E. Hardware only

11. Which device is used for storage?

A. SSD
B. Mouse
C. Speaker
D. Microphone
E. Scanner

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

12. The human digestive system’s output is:

A. Teeth
B. Digestion
C. Food
D. The stomach
E. Energy and waste

13. Which term means: “Data that enter a system”?

A. Boundary
B. Output
C. Feedback
D. Input
E. Storage

14. Which term means: “Actions that change inputs into outputs”?

A. Environment
B. Information system
C. Component
D. Process
E. Abstract model

15. Which term means: “Results that leave a system”?

A. CPU
B. Input
C. Output
D. System
E. Feedback

16. Which term means: “A simple model that shows the main idea and hides details”?

A. Abstract model
B. Storage
C. Process
D. Boundary
E. Information system

17. Which term means: “Related parts working together to reach a common goal”?

A. Environment
B. Component
C. System
D. Output
E. CPU

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

18. Which term means: “The line that separates a system from its environment”?

A. Input
B. Feedback
C. Storage
D. Boundary
E. Abstract model

19. Which term means: “Everything outside a system that affects it”?

A. System
B. Environment
C. Process
D. Information system
E. Component

20. Which term means: “Output sent back to control the input or process”?

A. Boundary
B. Output
C. Input
D. CPU
E. Feedback

Structured Questions

1. Draw and label the abstract model of information creation and explain each part. *(4 marks)*

> Input → Process → Output with arrows; input is data entering; process changes data by calculating, sorting or comparing; output is the information produced

2. Define a system and analyse an ATM using the definition (goal, input, process, output). *(5 marks)*

> Related parts working for a common goal; goal – give cash safely; input – card, PIN, amount; process – verify PIN, check balance, update account; output – cash, receipt

3. A student’s marks are 72, 85 and 64. Using the IPO model, show the input, the process steps and the output (average and grade). Use A 75+, B 65–74, C 50–64. *(5 marks)*

> Input 72, 85, 64; add = 221; divide by 3 = 73.67; compare with scale; output grade B

4. Match the IPO model to the main functions of a computer, naming one device for each. *(4 marks)*

> Input – accept data – keyboard; process – CPU (ALU and control unit); output – produce information – monitor; storage – keep data – SSD

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

5. Explain feedback using an automatic air conditioner. *(5 marks)*

> A sensor measures the room temperature (input); it is compared with the set value (process); the cooler runs (output); the new temperature is measured again and fed back; the cooler stops when the set value is reached

Summary

- Abstract model of information creation: input → process → output.
- A system is related parts working together for a common goal.
- Systems have a boundary, an environment, and often feedback and storage.
- Computer functions match the model: input devices, CPU, output devices, storage.
- An information system turns data into information.

MCQ answer key – 1.3

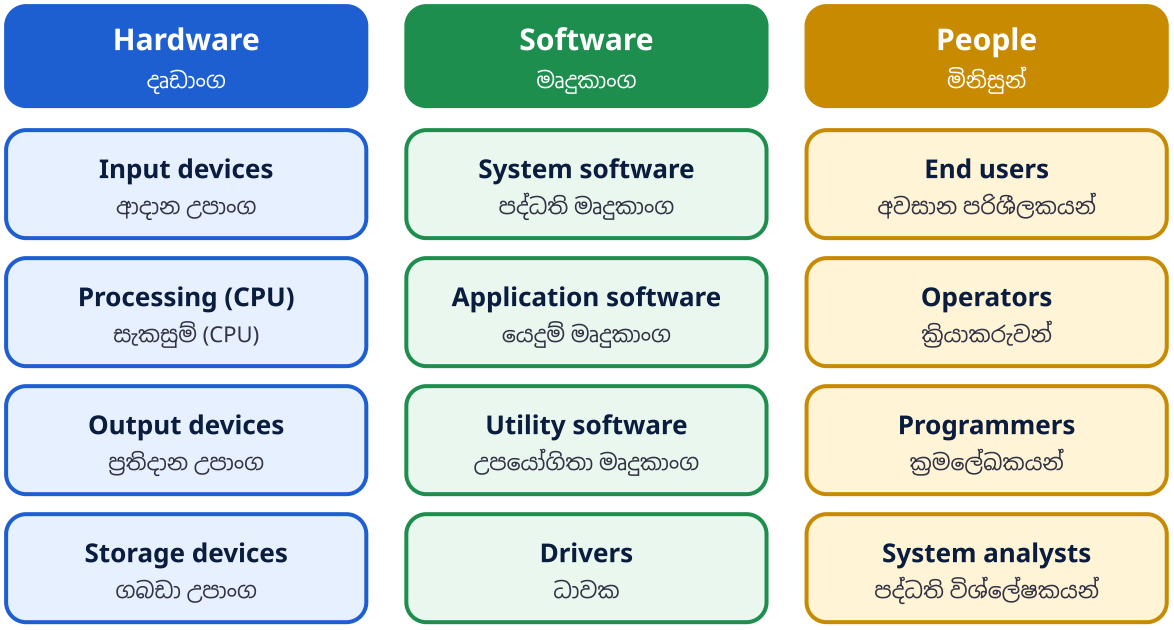
1. **B** – Data enter the system.
2. **C** – Data are changed.
3. **D** – 221 ÷ 3.
4. **B** – 65 ≤ 73.67 ≤ 74.
5. **E** – The CPU processes.
6. **E** – Output controls the system.
7. **A** – Outside the boundary.
8. **C** – Parts + goal + IPO.
9. **A** – Abstraction hides detail.
10. **B** – It is the result.
11. **A** – An SSD keeps data.
12. **E** – Food is input; digestion is process.
13. **D** – Input – Data that enter a system.
14. **D** – Process – Actions that change inputs into outputs.
15. **C** – Output – Results that leave a system.
16. **A** – Abstract model – A simple model that shows the main idea and hides details.
17. **C** – System – Related parts working together to reach a common goal.
18. **D** – Boundary – The line that separates a system from its environment.
19. **B** – Environment – Everything outside a system that affects it.
20. **E** – Feedback – Output sent back to control the input or process.

© 2026 schoolict.net (Ruwan Mangala Suraweera). All rights reserved.

Grade 12 A/L ICT · Lesson 1

1.4 Components of a Computer System: Hardware, Software and People

Syllabus 1.4. A computer system has three main kinds of parts: **hardware** (the parts you can touch), **software** (the programs that tell the hardware what to do) and **people** (the human operators who use and look after the system). In this part you classify hardware and software, compare **proprietary** and **open source** software, and see why people are still needed.



The three components of a computer system.

1. Hardware

Hardware is the physical parts of a computer. We classify hardware by its job in the IPO model:

Class	Job	Examples
Input devices	Enter data	Keyboard, mouse, scanner, microphone, touch screen, sensors
Processing devices	Process data	CPU, GPU
Output devices	Show results	Monitor, printer, speaker, projector
Storage devices	Keep data	RAM (primary), hard disk, SSD, flash drive (secondary)
Communication devices	Connect to networks	Network card, router, modem

💡 Some devices do two jobs: a touch screen is both input and output.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

2. Software

Software is the set of programs (instructions) that make the hardware work. It is classified into:

Class	Purpose	Examples
System software – operating system	Manages hardware and runs other programs	Windows, Linux, Android, macOS
System software – utility software	Maintains and protects the computer	Antivirus, disk cleanup, backup, compression
System software – device drivers	Let the OS talk to a device	Printer driver, graphics driver
System software – language translators	Change program code to machine code	Compiler, interpreter, assembler
Application software	Does a task for the user	Word processor, spreadsheet, web browser, games, payroll

Application software can be **general purpose** (word processors, spreadsheets – many users) or **special purpose / tailor-made** (a hospital patient system made for one organisation).

3. Proprietary software and open source software

Proprietary (closed source) software is owned by a company. Users buy a **licence** to use it, but cannot see or change the source code. Examples: Microsoft Windows, Microsoft Office, Adobe Photoshop. **Open source software (OSS)** has its source code freely available; anyone can use, study, change and share it under its licence. Examples: Linux, LibreOffice, Mozilla Firefox, GIMP, Python.

	Proprietary	Open source
Source code	Hidden	Open to all
Cost	Usually must buy a licence	Usually free
Advantages	Official support, tested, easy to use, regular updates	Free, can be changed, many people check for bugs, no vendor lock-in
Disadvantages	Costly, cannot change it, depends on one company	Support may be only from the community, some may be harder to learn

> 🧮 **Worked example: A school needs an office suite for 40 computers. A proprietary licence costs Rs. 25,000 per computer.**
> Proprietary cost = 40 × 25,000 = **Rs. 1,000,000**. An open source office suite such as LibreOffice costs **Rs. 0** for licences. The school must still think about training and support.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

> 💡 Free of cost (freeware) is not the same as open source. Freeware can be free to use while its code is still closed.

4. Human operators (people)

Hardware and software do nothing useful without people. Information systems need people to give instructions, enter data, make decisions, handle unusual cases and take responsibility.

Role	What they do
End user	Uses the system for daily work (cashier, teacher)
Data entry operator	Types data into the system accurately
System analyst	Studies needs and designs the system
Programmer / software engineer	Writes and tests programs
System / network administrator	Keeps computers and networks running and secure
Database administrator	Manages and protects the database

🚀 **Beyond the syllabus (2026 update)** *Not required for the exam – read for interest.* **Open source licences.** Open source software comes with a licence that sets the rules. **Permissive** licences (MIT, Apache 2.0, BSD) let you reuse the code even in closed products if you keep the copyright notice. **Copyleft** licences (GNU GPL) say that if you share a changed version, you must also share your source code under the GPL. Today many AI models are also released with open licences.

Key Words

Hardware – The physical parts of a computer that can be touched.

Software – Programs that tell the hardware what to do.

System software – Software that runs and manages the computer itself.

Application software – Software that does a task for the user.

Operating system – System software that manages hardware and runs programs.

Utility software – Programs that maintain and protect the computer.

Device driver – Software that lets the OS control a device.

Proprietary software – Software owned by a company with hidden source code.

Open source software – Software whose source code anyone may use, change and share.

Source code – The program instructions written by programmers.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

Licence – Legal permission that sets how software may be used.

Human operator – A person who uses or runs an information system.

System analyst – A person who studies needs and designs systems.

Sample Q&A

1. Name the three main components of a computer system.

> **Answer:** Hardware, software and people (human operators).

2. Classify hardware into four groups with one example each.

> **Answer:** Input – keyboard; processing – CPU; output – printer; storage – SSD.

3. Distinguish system software from application software.

> **Answer:** System software runs and manages the computer (e.g. an OS). Application software does a task for the user (e.g. a spreadsheet).

4. Give two advantages of open source software.

> **Answer:** It is usually free, and the source code can be studied and changed to suit the user.

5. Give two disadvantages of proprietary software.

> **Answer:** Licences cost money, and users cannot change the code and depend on one company.

6. Why are human operators needed in ICT systems?

> **Answer:** To give instructions, enter data, make decisions, handle unusual cases, maintain the system and take responsibility.

MCQ

1. Which is an example of system software?

A. A web browser
B. A spreadsheet
C. Linux
D. A payroll system
E. A game

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

2. Antivirus software belongs to:

A. Utility software
B. Hardware
C. Device drivers
D. Input devices
E. Application software only

3. Which software lets the OS control a new printer?

A. Word processor
B. Firewall
C. Spreadsheet
D. Compiler
E. Device driver

4. Which of these is open source?

A. Microsoft Windows
B. LibreOffice
C. macOS
D. Microsoft Office
E. Adobe Photoshop

5. 40 computers × Rs. 25,000 licence each = ?

A. Rs. 625,000
B. Rs. 100,000
C. Rs. 1,000,000
D. Rs. 10,000,000
E. Rs. 25,040

6. A touch screen is:

A. System software
B. Only storage
C. Only an input device
D. Both an input and an output device
E. A processing device

7. The main feature of proprietary software is:

A. Anyone can change it
B. It is always free
C. It is hardware
D. Its source code is hidden and owned by a company
E. It has no licence

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

8. Who studies user needs and designs a new information system?

A. Cashier
B. System analyst
C. Printer
D. Data entry operator
E. End user

9. RAM is classified as:

A. Secondary storage
B. A network
C. Output device
D. Application software
E. Primary storage

10. Freeware is:

A. Free to use but may still be closed source
B. A type of hardware
C. Always proprietary and paid
D. Always open source
E. Illegal software

11. A hospital system made only for one hospital is:

A. Hardware
B. Tailor-made (special purpose) software
C. A device driver
D. General purpose software
E. Utility software

12. Which translates a whole program into machine code before running?

A. Interpreter
B. Browser
C. Compiler
D. Antivirus
E. Device driver

13. Which term means: “The physical parts of a computer that can be touched”?

A. System software
B. Proprietary software
C. Licence
D. Utility software
E. Hardware

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

14. Which term means: “Programs that tell the hardware what to do”?

A. Software
B. Open source software
C. Human operator
D. Application software
E. Device driver

15. Which term means: “Software that runs and manages the computer itself”?

A. System analyst
B. Proprietary software
C. Source code
D. System software
E. Operating system

16. Which term means: “Software that does a task for the user”?

A. Hardware
B. Open source software
C. Licence
D. Application software
E. Utility software

17. Which term means: “System software that manages hardware and runs programs”?

A. Software
B. Source code
C. Human operator
D. Device driver
E. Operating system

18. Which term means: “Programs that maintain and protect the computer”?

A. System software
B. Utility software
C. Proprietary software
D. System analyst
E. Licence

19. Which term means: “Software that lets the OS control a device”?

A. Human operator
B. Hardware
C. Device driver
D. Application software
E. Open source software

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

20. Which term means: “Software owned by a company with hidden source code”?

A. Proprietary software
B. Operating system
C. System analyst
D. Software
E. Source code

Structured Questions

1. Classify software into system and application software. Give two examples of each and explain the purpose of each class. *(2 marks)*

> System software runs and manages the computer – Windows, antivirus; application software does tasks for users – spreadsheet, web browser

2. Distinguish proprietary software from open source software and give one advantage and one disadvantage of each. *(6 marks)*

> Proprietary – owned, hidden code, licence fee; advantage official support; disadvantage cost; open source – code open, usually free; advantage can be changed; disadvantage support mainly from the community

3. A school has 40 computers. A proprietary office licence is Rs. 25,000 each. (a) Calculate the total cost. (b) Suggest an open source option and one thing the school must still plan for. *(3 marks)*

> (a) 40 × 25,000 = Rs. 1,000,000; (b) LibreOffice; teacher and student training

4. Classify the hardware of a supermarket POS system into input, process, output and storage. *(4 marks)*

> Input – bar code reader, keyboard, card reader; process – CPU; output – receipt printer, customer display; storage – hard disk or SSD holding the product database

5. Explain the role of three types of human operators in a bank information system. *(3 marks)*

> End users (tellers) enter transactions and serve customers; the database administrator protects account data; the network administrator keeps branch networks and ATMs connected and secure

Summary

- A computer system = hardware + software + people.
- Hardware: input, processing, output, storage and communication devices.
- Software: system (OS, utilities, drivers, translators) and application.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

- Proprietary: closed code, licence fee. Open source: open code, usually free.
- People give instructions, enter data, decide and maintain systems.

MCQ answer key – 1.4

1. **C** – Linux is an operating system.
2. **A** – It maintains and protects the computer.
3. **E** – Drivers connect OS and device.
4. **B** – Its source code is open.
5. **C** – 40 × 25,000 = 1,000,000.
6. **D** – You touch (input) and see (output).
7. **D** – Closed source.
8. **B** – Analysis and design.
9. **E** – Main memory.
10. **A** – Free price ≠ open code.
11. **B** – Built for one organisation.
12. **C** – An interpreter translates line by line.
13. **E** – Hardware – The physical parts of a computer that can be touched.
14. **A** – Software – Programs that tell the hardware what to do.
15. **D** – System software – Software that runs and manages the computer itself.
16. **D** – Application software – Software that does a task for the user.
17. **E** – Operating system – System software that manages hardware and runs programs.
18. **B** – Utility software – Programs that maintain and protect the computer.
19. **C** – Device driver – Software that lets the OS control a device.
20. **A** – Proprietary software – Software owned by a company with hidden source code.

© 2026 schoolict.net (Ruwan Mangala Suraweera). All rights reserved.

Grade 12 A/L ICT · Lesson 1

1.5 Data Processing: Gathering, Validation, Processing, Output and Storage

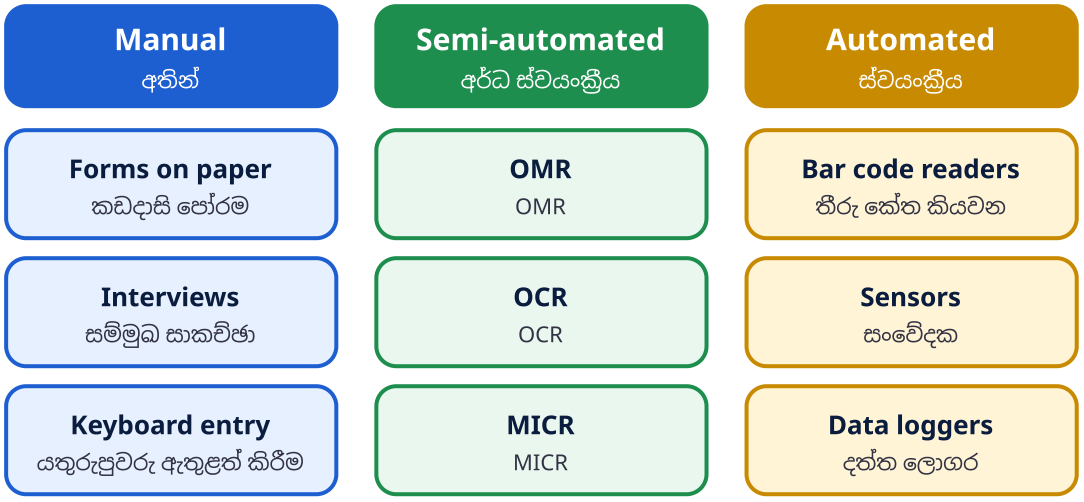
Syllabus 1.5. Data processing is the full set of steps that turns raw data into useful information. In this part you learn the steps in order: **data gathering**, **data input**, **data validation**, **processing**, **output** and **storage**. You also learn the tools used to collect data and the different **modes** of processing.



The steps of data processing.

1. Data gathering

Data can be gathered **manually** (people fill forms, interviews, questionnaires, observation) or **automatically** using machines. Automatic methods are faster and make fewer mistakes.



Automatic data gathering tools.

Tool	How it works	Where it is used
OMR – Optical Mark Reader	Senses pencil or pen marks in fixed boxes	MCQ answer sheets, lottery tickets, surveys
OCR – Optical Character Recognition	Software reads printed or handwritten letters from a scanned image and changes them into editable text	Scanning documents, number plate reading, passports

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

MICR – Magnetic Ink Character Recognition	Reads characters printed in magnetic ink	Bank cheques
Punched cards and paper tape	Holes in fixed positions stand for data (an early method)	Early computers, old voting and attendance machines
Magnetic strip reader	Reads data stored on a magnetic strip	Bank cards, hotel key cards
Bar code / QR code reader	Reads black and white bars or squares using light	Supermarkets, libraries, tickets
Sensors and data loggers	A sensor measures a physical quantity; a data logger records the readings over time	Weather stations, greenhouses, hospitals

🧱 **Worked example: Compare OMR with marking by hand**
A school has **1,800** MCQ answer sheets. An OMR reads **3,600** sheets per hour, a teacher marks **60** per hour. OMR time = 1,800 × 60 ÷ 3,600 = **30 minutes**. Hand time = 1,800 ÷ 60 = **30 hours**.

2. Data input methods

Method	Meaning	Example
Direct input	Data go straight from the source into the computer with no human typing	Bar code scan, sensor, OMR
Indirect input	Data are first written on paper, then typed in later	Census forms typed by clerks
Remote input	Data are entered far away and sent over a network	Online application form, ATM
Online input	Device is connected to the main computer while entering data	Booking a train seat
Offline input	Data are entered and stored first, then uploaded later	Meter reader's handheld device

3. Data validation



Validation checks that data are reasonable before processing.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

Validation is an automatic check done by the computer to make sure input data are sensible and follow the rules. It cannot prove data are correct (a valid mark 78 may still be typed wrongly) – that is checked by **verification** (double entry or checking against the source).

Check	What it checks	Example
Presence check	A required field is not left blank	Name must be entered
Data type check	Data are the right type (number, text, date)	Age must be a number
Range check	A value is between a lowest and highest value	Mark from 0 to 100
Length check	Data have the right number of characters	Mobile number has 10 digits
Format check	Data follow a pattern	Date as DD/MM/YYYY
Check digit	An extra digit calculated from the others finds typing errors	ISBN, bar codes

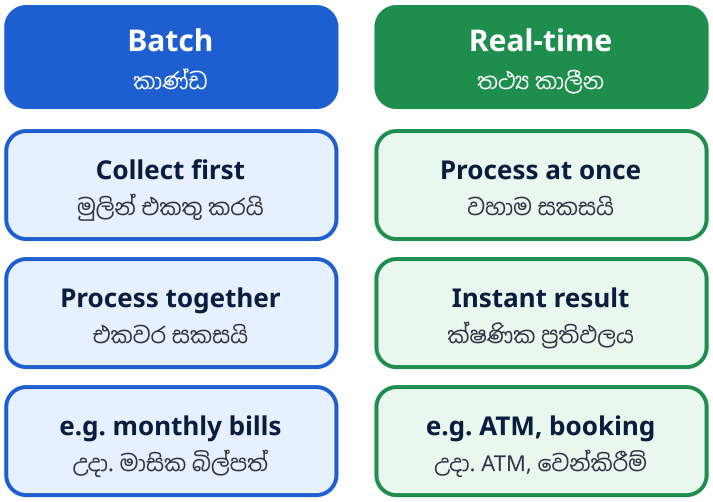
Worked example: the computer checks each student record in this order – presence (name), data type (age and mark are whole numbers), range (mark 0–100). It stops at the first check that fails.

ID	Name	Age	Mark	Result
S01	Nimal	17	78	Valid
S02	(blank)	17	65	Presence check failed
S03	Kamala	seventeen	80	Data type check failed
S04	Ruwan	18	105	Range check failed
S05	Fathima	17	-3	Range check failed
S06	Tharindu	16	0	Valid
S07	Saman	17	100	Valid

💡 Boundary values 0 and 100 are valid. Only S01, S06, S07 pass all checks.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

4. Data processing modes



Batch processing and real-time processing.

	Batch processing	Real-time processing
Meaning	Data are collected over a period and processed together as one group (batch)	Each item is processed immediately when it arrives
Response	Delayed	Instant
Examples	Electricity and water bills, payroll, exam results	ATM withdrawal, seat booking, traffic lights, air-bag control
Advantages	Uses the computer efficiently at quiet times; good for large volumes	Information is always up to date
Disadvantages	Information is not up to date between runs	Needs powerful, always-on systems; costly

> 🧱 **Worked example: Batch processing of electricity bills**
> Meter readings for **12,000** homes are collected during the month. At night the computer prints **400** bills per minute. Time = 12,000 ÷ 400 = **30 minutes**.

5. Output

Output gives the processed information to users in a useful form: **soft copy** (screen, sound, file) or **hard copy** (printout). Good output is clear, correct, on time and suitable for the user – for example reports, charts, bills, receipts, alerts and SMS messages.

6. Storage

Type	Meaning	Example
Local storage	Data kept on devices you own	Hard disk, SSD, flash drive
Cloud storage	Data kept on servers on the Internet	Google Drive, OneDrive

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

Short-term storage	Holds data while being processed; usually lost when power is off	RAM, cache
Long-term storage	Keeps data for years	Hard disk, optical disc, magnetic tape, cloud archive

🚀 **Beyond the syllabus (2026 update)** *Not required for the exam – read for interest.* **AI-powered data gathering.** In 2026 many apps use AI vision: a phone camera reads a receipt and fills a form (OCR + AI), or a camera counts vehicles for traffic control. Data still need validation, because AI can misread.

Key Words

Data processing – The steps that turn raw data into information.

OMR – A device that senses marks in fixed boxes on a form.

OCR – Software that turns scanned letters into editable text.

MICR – Reading characters printed in magnetic ink on cheques.

Data logger – A device that records sensor readings over time.

Direct input – Data entered straight from the source without typing.

Validation – An automatic check that input data are sensible.

Verification – Checking that data were copied correctly from the source.

Range check – A check that a value is between a lowest and highest value.

Presence check – A check that a required field is not blank.

Batch processing – Collecting data and processing them together later.

Real-time processing – Processing each item immediately as it arrives.

Cloud storage – Keeping data on servers on the Internet.

Sample Q&A

1. List the steps of data processing in order.

> **Answer:** Data gathering, data input, validation, processing, output, storage.

2. Name four automatic data gathering tools.

> **Answer:** OMR, OCR, MICR, bar code reader (also magnetic strip readers, sensors and data loggers).

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

3. Distinguish validation from verification.

> **Answer:** Validation checks data are sensible using rules; verification checks data were copied correctly from the source.

4. Why does mark 105 fail but mark 100 pass a range check of 0–100?

> **Answer:** 100 is the highest allowed value, so it is inside the range; 105 is above it.

5. Give two examples each of batch and real-time processing.

> **Answer:** Batch: electricity bills, payroll. Real-time: ATM withdrawal, train seat booking.

6. Compare local storage and cloud storage.

> **Answer:** Local storage is on your own devices and works without the Internet; cloud storage is on Internet servers and can be reached from anywhere but needs a connection.

MCQ

1. Which device is used to read bank cheques?

A. MICR
B. OMR
C. Plotter
D. Bar code reader
E. Data logger

2. MCQ answer sheets are best read by:

A. OMR
B. Magnetic strip reader
C. Speaker
D. MICR
E. OCR

3. An OMR reads 3,600 sheets per hour. Time for 1,800 sheets?

A. 18 minutes
B. 30 minutes
C. 60 minutes
D. 3 hours
E. 2 minutes

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

4. A teacher marks 60 sheets per hour. Time for 1,800 sheets?

A. 60 hours
B. 3 hours
C. 18 hours
D. 300 hours
E. 30 hours

5. A record has a blank name. Which check fails?

A. Range check
B. Presence check
C. Data type check
D. Format check
E. Check digit

6. Age entered as “seventeen” fails the:

A. Data type check
B. Length check
C. Range check
D. Verification
E. Presence check

7. With a range of 0–100, which mark is INVALID?

A. 100
B. 105
C. 65
D. 78
E. 0

8. In the worked example, which records are valid?

A. S01 only
B. S04, S05
C. S01, S06, S07
D. All seven
E. S01, S02, S07

9. Which is an example of real-time processing?

A. Electricity bills
B. Monthly payroll
C. Yearly census report
D. ATM cash withdrawal
E. Exam result printing

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

10. 12,000 bills are printed at 400 per minute. Time?

A. 300 minutes
B. 12 minutes
C. 30 minutes
D. 3 minutes
E. 48 minutes

11. Entering data on a handheld device and uploading it later is:

A. Verification
B. Real-time output
C. Online input
D. Offline input
E. Cloud storage

12. RAM is an example of:

A. Cloud storage
B. Short-term storage
C. Hard copy
D. An input device
E. Long-term storage

13. Which term means: “The steps that turn raw data into information”?

A. OCR
B. Verification
C. Direct input
D. Data processing
E. Batch processing

14. Which term means: “A device that senses marks in fixed boxes on a form”?

A. Validation
B. Range check
C. MICR
D. Real-time processing
E. OMR

15. Which term means: “Software that turns scanned letters into editable text”?

A. Data logger
B. Presence check
C. OCR
D. Cloud storage
E. Verification

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

16. Which term means: “Reading characters printed in magnetic ink on cheques”?

A. Data processing
B. Direct input
C. MICR
D. Batch processing
E. Range check

17. Which term means: “A device that records sensor readings over time”?

A. Validation
B. Presence check
C. Real-time processing
D. OMR
E. Data logger

18. Which term means: “Data entered straight from the source without typing”?

A. Direct input
B. Batch processing
C. Verification
D. OCR
E. Cloud storage

19. Which term means: “An automatic check that input data are sensible”?

A. Real-time processing
B. MICR
C. Range check
D. Data processing
E. Validation

20. Which term means: “Checking that data were copied correctly from the source”?

A. Presence check
B. Cloud storage
C. Data logger
D. Verification
E. OMR

Structured Questions

1. Name and explain the steps of data processing in the correct order. *(6 marks)*

> Gathering – collect data; input – enter into the computer; validation – check data are sensible; processing – calculate, sort, compare; output – give information; storage – keep for later

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

2. Select a suitable data gathering tool for each: (a) bank cheques (b) MCQ answer sheets (c) supermarket goods (d) greenhouse temperature. Give a reason for one. *(5 marks)*

> (a) MICR; (b) OMR; (c) bar code reader; (d) temperature sensor with data logger; reason e.g. MICR ink cannot easily be forged

3. Records are checked in the order presence, data type, range (mark 0–100). State the result for: S02 (name blank), S03 (age "seventeen"), S04 (mark 105), S07 (mark 100). *(4 marks)*

> S02 – Presence check failed; S03 – Data type check failed; S04 – Range check failed; S07 – Valid (100 is the boundary)

4. Compare batch processing and real-time processing with one example and one advantage of each. *(6 marks)*

> Batch – data grouped and processed later; example electricity bills; advantage efficient for large volumes; real-time – processed at once; example ATM; advantage information always up to date

5. 12,000 electricity bills are processed as a batch at 400 bills per minute. (a) Find the time. (b) Explain why billing suits batch processing. *(4 marks)*

> (a) 12000 ÷ 400 = 30 minutes; (b) readings are collected over a month; no instant answer is needed; can run at night when the computer is free

Summary

- Data processing: gather → input → validate → process → output → store.
- Automatic gathering tools: OMR, OCR, MICR, cards, magnetic strips, bar codes, sensors, loggers.
- Validation checks data are sensible; verification checks they were copied correctly.
- Batch processing groups data; real-time processing acts at once.
- Storage can be local or cloud, short-term or long-term.

MCQ answer key – 1.5

1. **A** – Magnetic ink characters.
2. **A** – Marks in fixed boxes.
3. **B** – 1800 × 60 ÷ 3600 = 30.
4. **E** – 1800 ÷ 60 = 30.
5. **B** – Required field is empty.
6. **A** – Text, not a number.
7. **B** – 105 > 100.
8. **C** – S02–S05 fail a check.
9. **D** – Balance is updated at once.
10. **C** – 12000 ÷ 400 = 30.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

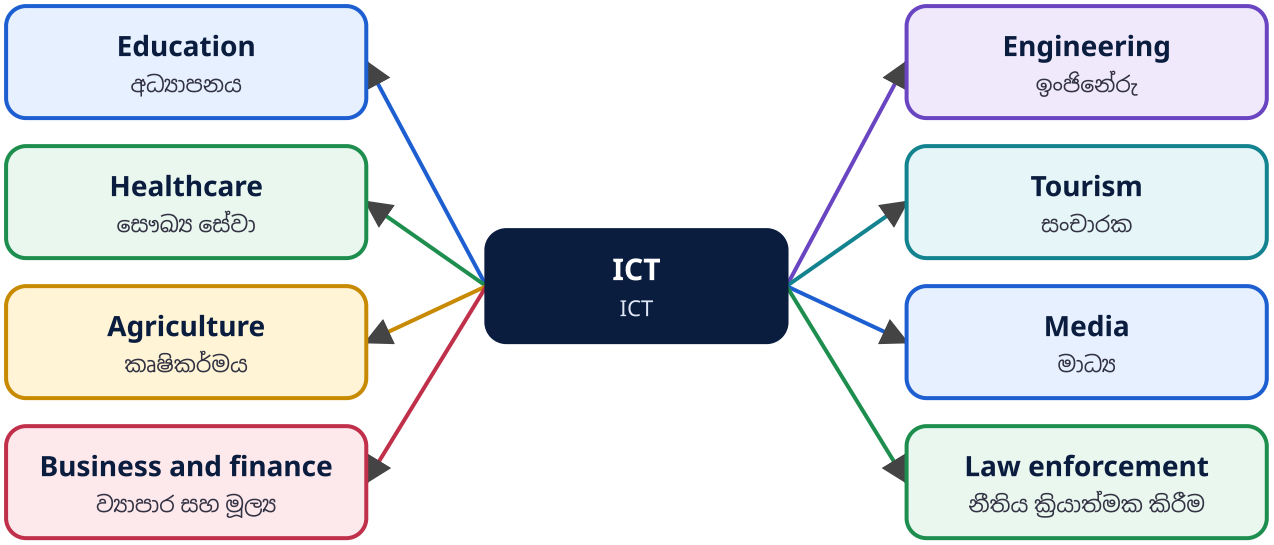
11. **D** – Not connected while entering.
12. **B** – Lost when power is off.
13. **D** – Data processing – The steps that turn raw data into information.
14. **E** – OMR – A device that senses marks in fixed boxes on a form.
15. **C** – OCR – Software that turns scanned letters into editable text.
16. **C** – MICR – Reading characters printed in magnetic ink on cheques.
17. **E** – Data logger – A device that records sensor readings over time.
18. **A** – Direct input – Data entered straight from the source without typing.
19. **E** – Validation – An automatic check that input data are sensible.
20. **D** – Verification – Checking that data were copied correctly from the source.

© 2026 schoolict.net (Ruwan Mangala Suraweera). All rights reserved.

Grade 12 A/L ICT · Lesson 1

1.6 Applications of ICT in Different Domains

Syllabus 1.6. ICT is used in almost every area (domain) of life. In this part you explore how ICT is used in **education, healthcare, agriculture, business and banking, engineering, transport, government and media**, which tools are used, and which **ICT skills** people need to use these tools well.



ICT is used in many domains.

1. ICT tools in each domain

Domain	ICT tools and uses	Benefit
Education	LMS (Moodle, Google Classroom), e-books, video lessons, online exams, smart boards	Learning any time, anywhere; e-learning; distance learning
Healthcare	Electronic health records, telemedicine, scanners (CT, MRI), patient monitors, e-channelling	Faster, more accurate diagnosis; doctors reached from far away
Agriculture	Soil and weather sensors, drones, automatic irrigation, market price apps	Precision farming; less water and fertiliser; better prices
Business and banking	E-commerce, online banking, ATMs, POS, accounting software, digital payments (LankaQR)	Trade 24 hours; faster payments; global customers
Engineering and manufacturing	CAD/CAM, robots, simulation, 3D printing	Accurate designs; automated production
Transport	GPS navigation, online ticketing, traffic control, ride-hailing apps	Safer, faster travel; less waiting

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

Government (e-governance)	Online services (gov.lk), e-revenue licence, online tax, digital ID	Less queueing; transparency; services from home
Media and entertainment	Social media, streaming, digital TV, online news, games	Instant news; new jobs for content creators

2. Some important terms

- **E-learning** – learning using electronic media and the Internet.
- **Telemedicine** – a doctor treats a patient from a distance using video and data links.
- **E-commerce** – buying and selling goods and services over the Internet.
- **E-governance** – the government gives services and information using ICT.
- **CAD/CAM** – computer-aided design and computer-aided manufacturing.
- **Precision agriculture** – using sensors, GPS and data to give each part of a field exactly what it needs.

🧱 **Worked example: Choose ICT tools for a domain**
A rural hospital has no heart specialist. **Tool:** telemedicine (video call + sending ECG data). **Input:** ECG readings. **Process:** the specialist in Colombo studies them. **Output:** advice to the local doctor. **Benefit:** the patient does not travel.

3. ICT skills people need

Skill	Example
Basic computer operation	Using an OS, files and folders
Office applications	Word processing, spreadsheets, presentations
Internet and communication	Searching, email, video meetings
Information literacy	Checking if information is true and from a reliable source
Safety and security	Strong passwords, spotting phishing
Special software	CAD for engineers, accounting software for accountants

💡 Exam tip: when asked about a domain, give the tool, what it does and the benefit – three marks in one sentence.

🚀 **Beyond the syllabus (2026 update)** *Not required for the exam – read for interest.* **Generative AI in many domains (2026).** Teachers use AI to make practice questions, doctors use AI to read X-rays, farmers use AI apps to identify plant diseases from a photo, and businesses use chatbots. Skills now include **writing good prompts** and **checking AI answers**, because AI can be wrong or biased.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

Key Words

Domain – An area of life or work where ICT is used.

E-learning – Learning using electronic media and the Internet.

LMS – A learning management system that delivers online courses.

Telemedicine – Treating patients from a distance using ICT.

Electronic health record – A patient's medical history stored digitally.

Precision agriculture – Farming using sensors, GPS and data for exact care.

E-commerce – Buying and selling over the Internet.

Online banking – Doing bank work through the Internet.

CAD – Computer-aided design of objects and buildings.

CAM – Computer-controlled machines that make products.

GPS – A satellite system that finds exact location.

E-governance – Government services given through ICT.

Information literacy – The skill of finding and judging reliable information.

Sample Q&A

1. Give two uses of ICT in education.

> **Answer:** Learning management systems for online lessons, and online exams or e-books.

2. What is telemedicine?

> **Answer:** Giving medical care from a distance using video calls and sending patient data over networks.

3. How does ICT help farmers?

> **Answer:** Sensors and drones show soil and crop needs, automatic irrigation saves water, and apps give market prices and weather.

4. What is e-governance? Give an example.

> **Answer:** Government services through ICT. Example: renewing a vehicle revenue licence online.

5. Name two ICT tools used in engineering.

> **Answer:** CAD software for design and CAM / robots for manufacturing.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

6. Why is information literacy an important ICT skill?

> **Answer:** Because much online information is false; people must check sources before using or sharing information.

MCQ

1. Treating a patient from a distance by video is:

A. Batch processing
B. Telemedicine
C. CAD
D. E-commerce
E. E-governance

2. Engineers design a bridge using:

A. OMR
B. MICR
C. A spreadsheet only
D. An LMS
E. CAD software

3. Moodle and Google Classroom are examples of:

A. CAD tools
B. Operating systems
C. Device drivers
D. Learning management systems
E. Search engines

4. Using soil sensors and drones to give each part of a field what it needs is:

A. E-commerce
B. Batch processing
C. Precision agriculture
D. Telemedicine
E. Piracy

5. Renewing a vehicle revenue licence online is an example of:

A. E-governance
B. Telemedicine
C. E-learning
D. Social media
E. CAM

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

6. Buying goods from an online shop is:

A. Telemedicine
B. E-governance
C. E-commerce
D. E-learning
E. CAD

7. Which tool helps a driver find the shortest route?

A. GPS navigation
B. OMR
C. LMS
D. MICR
E. CAD

8. Checking whether online information comes from a reliable source is:

A. CAM
B. Piracy
C. Batch processing
D. Data logging
E. Information literacy

9. Robots on a car assembly line are an example of:

A. OCR
B. CAD
C. LMS
D. CAM
E. E-governance

10. A patient’s medical history stored digitally is a(n):

A. CAD drawing
B. Bar code
C. E-book
D. Spam email
E. Electronic health record

11. LankaQR is used for:

A. Reading cheques
B. Digital payments
C. Designing buildings
D. Weather forecasts
E. Online exams

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

12. A benefit of e-learning is:

A. Learning any time, anywhere
B. Teachers are not needed at all
C. It is always offline
D. No Internet ever needed
E. No need for any device

13. Which term means: “An area of life or work where ICT is used”?

A. LMS
B. Domain
C. Online banking
D. GPS
E. Precision agriculture

14. Which term means: “Learning using electronic media and the Internet”?

A. E-governance
B. Telemedicine
C. E-learning
D. CAD
E. E-commerce

15. Which term means: “A learning management system that delivers online courses”?

A. Electronic health record
B. CAM
C. Information literacy
D. LMS
E. Online banking

16. Which term means: “Treating patients from a distance using ICT”?

A. Telemedicine
B. Domain
C. CAD
D. Precision agriculture
E. GPS

17. Which term means: “A patient’s medical history stored digitally”?

A. CAM
B. E-learning
C. Electronic health record
D. E-commerce
E. E-governance

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

18. Which term means: "Farming using sensors, GPS and data for exact care"?

A. Online banking
B. Precision agriculture
C. GPS
D. Information literacy
E. LMS

19. Which term means: "Buying and selling over the Internet"?

A. CAD
B. E-governance
C. Domain
D. E-commerce
E. Telemedicine

20. Which term means: "Doing bank work through the Internet"?

A. CAM
B. E-learning
C. Electronic health record
D. Information literacy
E. Online banking

Structured Questions

1. Explain how ICT is used in healthcare, naming three tools. *(4 marks)*

> Electronic health records keep patient history; scanners such as MRI and CT help diagnosis; telemedicine lets specialists treat patients far away; patient monitors give alerts

2. Describe two ways ICT helps agriculture in Sri Lanka. *(3 marks)*

> Soil and weather sensors with automatic irrigation save water; drones check crop health; mobile apps give market prices and weather so farmers get better prices

3. Define e-commerce and e-governance, and give one benefit of each. *(4 marks)*

> E-commerce – buying and selling online; benefit – trade 24 hours with global customers; e-governance – government services through ICT; benefit – less queueing and more transparency

4. A rural hospital has no heart specialist. Using the IPO model, explain how telemedicine helps. *(4 marks)*

> Input – ECG readings and video of the patient; process – the specialist studies them remotely; output – diagnosis and advice to the local doctor; benefit – no travel, faster treatment

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

5. Name four ICT skills that a modern office worker needs and give an example of each. *(4 marks)*

> Basic operation – managing files; office applications – spreadsheets; communication – email and video meetings; safety – spotting phishing and using strong passwords

Summary

- ICT is used in education, health, agriculture, business, engineering, transport, government and media.
- Key terms: e-learning, telemedicine, e-commerce, e-governance, CAD/CAM.
- Each domain uses special tools to save time, cost and effort.
- People need basic, office, communication, information literacy and safety skills.
- In exams, give the tool, what it does and the benefit.

MCQ answer key – 1.6

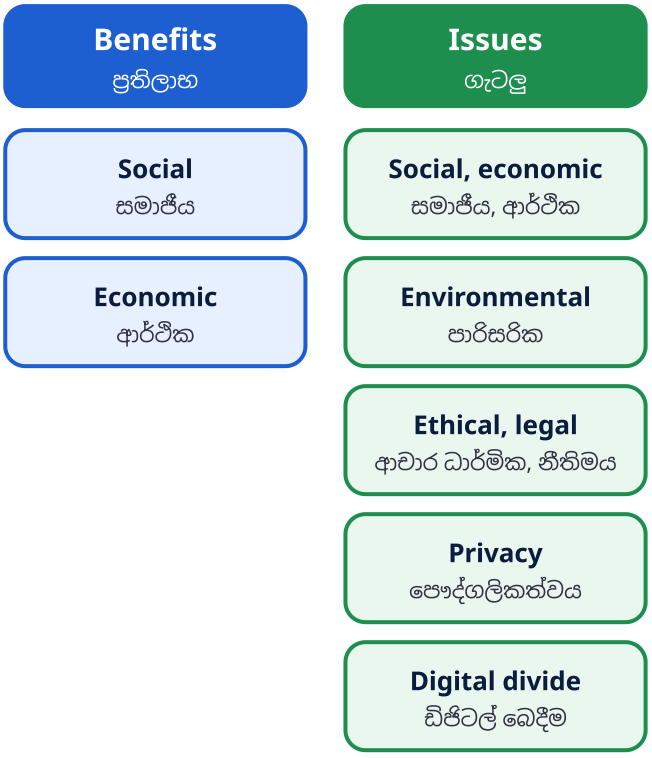
1. **B** – Tele = far.
2. **E** – Computer-aided design.
3. **D** – Used in education.
4. **C** – Exact care with data.
5. **A** – A government service.
6. **C** – Online trade.
7. **A** – Satellite location.
8. **E** – An ICT skill.
9. **D** – Computer-aided manufacturing.
10. **E** – Healthcare tool.
11. **B** – Scan to pay.
12. **A** – Flexible learning.
13. **B** – Domain – An area of life or work where ICT is used.
14. **C** – E-learning – Learning using electronic media and the Internet.
15. **D** – LMS – A learning management system that delivers online courses.
16. **A** – Telemedicine – Treating patients from a distance using ICT.
17. **C** – Electronic health record – A patient's medical history stored digitally.
18. **B** – Precision agriculture – Farming using sensors, GPS and data for exact care.
19. **D** – E-commerce – Buying and selling over the Internet.
20. **E** – Online banking – Doing bank work through the Internet.

© 2026 schoolict.net (Ruwan Mangala Suraweera). All rights reserved.

Grade 12 A/L ICT · Lesson 1

1.7 Impact of ICT on Society: Benefits, Issues and the Digital Divide

Syllabus 1.7. ICT has changed how we live, learn and work. It brings many **benefits**, but also **social, economic, environmental, ethical, legal and privacy issues**. In this part you study these issues, the laws in Sri Lanka that deal with them, e-waste, the **Sustainable Development Goals** and the **digital divide**.



ICT has benefits and issues.

1. Benefits of ICT

- Fast, cheap communication across the world.
- Better education and health services, even in rural areas.
- New jobs and businesses (software, BPO, freelancing, e-commerce).
- Faster, more accurate work and less paper.
- Easy access to government services and information.

2. Issues caused by ICT

Type	Issues
Social	Less face-to-face contact, addiction to games and social media, cyberbullying, fake news

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

Economic	Some jobs replaced by automation, cost of equipment, online fraud
Environmental	E-waste, high electricity use by data centres
Health	Eye strain, back pain, repetitive strain injury, lack of exercise
Ethical and legal	Piracy, plagiarism, hacking, misuse of personal data

3. Privacy, confidentiality and security

Privacy is the right of a person to control information about themselves. **Confidentiality** means information is seen only by the people who are allowed to see it (for example medical or bank records). Threats include **hacking** (getting into a system without permission), **malware** (viruses, ransomware) and **phishing** – fake emails, messages or websites that trick people into giving passwords or card numbers.

> 🧱 **Worked example: Spot the phishing message**
> An SMS says: "Your bank account is blocked. Click bank-lk-verify.xyz and enter your PIN within 1 hour." **Signs:** urgent threat, strange web address (not the bank's real domain), asks for a PIN (banks never ask). **Action:** do not click; call the bank on its official number; delete the message.

4. Intellectual property: copyright, piracy, plagiarism and licensing

Term	Meaning
Copyright	The legal right of a creator to control copying of their work (software, music, books)
Software piracy	Copying, sharing or using software without a valid licence
Plagiarism	Presenting someone else's work or ideas as your own without credit
Licensed software	Software used under the rules of its licence – single user, site licence, open source licence

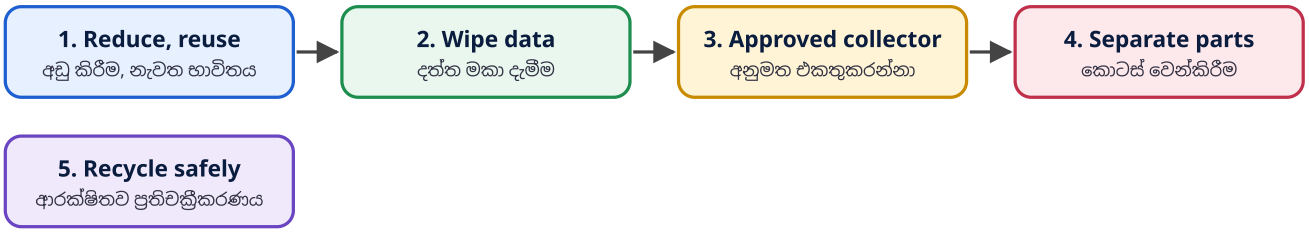
> 💡 To avoid plagiarism: write in your own words, use quotation marks for exact words, and give the source (cite).

5. ICT laws in Sri Lanka

Law	What it does
Intellectual Property Act No. 36 of 2003	Protects copyright, patents and trademarks
Electronic Transactions Act No. 19 of 2006	Electronic documents and signatures are legal
Computer Crimes Act No. 24 of 2007	Unauthorised access, hacking and data damage are crimes
Personal Data Protection Act No. 9 of 2022	Organisations must protect personal data

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

6. E-waste



Handle e-waste safely: reduce, reuse, recycle.

E-waste is old or broken electronic equipment (phones, computers, batteries). It contains harmful materials such as lead, mercury and cadmium that pollute soil and water if dumped or burnt. Good practice: **reduce** (buy only what is needed, repair), **reuse** (donate working devices), **recycle** (give to an approved e-waste collector).

7. ICT and the Sustainable Development Goals

In 2015 the United Nations agreed on **17 Sustainable Development Goals (SDGs)** to reach by 2030. ICT helps many of them, for example: Goal 3 (good health – telemedicine), Goal 4 (quality education – e-learning), Goal 8 (decent work – online jobs), Goal 9 (industry, innovation and infrastructure – broadband) and Goal 13 (climate action – sensors and data to watch the weather).

8. The digital divide

The **digital divide** is the gap between people who have access to ICT and the skills to use it, and people who do not. Causes: cost of devices and data, no Internet coverage in rural areas, lack of ICT skills, language barriers, age and disability. Ways to reduce it: Nenasala (community telecentres), school computer labs, cheaper data, content in Sinhala and Tamil, and training programmes.

🚀 **Beyond the syllabus (2026 update)** *Not required for the exam – read for interest.* **New issues in 2026. Deepfakes** – AI-made fake videos and voices – are used for scams and false news; check the source before you believe or share. Sri Lanka's **Personal Data Protection Act No. 9 of 2022** is being brought into force in stages, so organisations must protect personal data and tell people how it is used. E-waste is growing fast as phones are replaced more often.

Key Words

Privacy – A person's right to control information about themselves.

Confidentiality – Information is seen only by people allowed to see it.

Phishing – Fake messages or websites that trick people into giving secrets.

Hacking – Getting into a computer system without permission.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

Malware – Harmful software such as viruses and ransomware.

Copyright – A creator's legal right to control copying of their work.

Software piracy – Copying or using software without a valid licence.

Plagiarism – Presenting another person's work as your own.

E-waste – Old or broken electronic equipment that is thrown away.

Digital divide – The gap between people with and without access to ICT.

SDGs – The 17 UN goals for a better world by 2030.

Cyberbullying – Using ICT to hurt or threaten another person.

Deepfake – A fake video or voice made with AI.

Sample Q&A

1. Give two social and two environmental issues caused by ICT.

> **Answer:** Social: cyberbullying, addiction. Environmental: e-waste, high electricity use by data centres.

2. What is phishing and how can you protect yourself?

> **Answer:** Fake messages that trick you into giving passwords or card numbers. Do not click unknown links, check the web address, never share a PIN, and contact the organisation directly.

3. Distinguish software piracy from plagiarism.

> **Answer:** Piracy is copying or using software without a licence; plagiarism is presenting someone else's work or ideas as your own.

4. Name the Sri Lankan law that makes hacking a crime.

> **Answer:** The Computer Crimes Act No. 24 of 2007.

5. Why is e-waste harmful and how should it be handled?

> **Answer:** It contains lead, mercury and cadmium that pollute soil and water. Reduce, reuse and recycle through approved collectors.

6. What is the digital divide? Give two ways to reduce it.

> **Answer:** The gap between people who have ICT access and skills and those who do not. Reduce it with Nenasala centres, school computer labs, cheaper data or training.

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

MCQ

1. Which Sri Lankan act protects copyright of software?

A. Computer Crimes Act No. 24 of 2007
B. Motor Traffic Act
C. Personal Data Protection Act No. 9 of 2022
D. Intellectual Property Act No. 36 of 2003
E. Electronic Transactions Act No. 19 of 2006

2. Which act makes electronic documents and signatures legal?

A. Electronic Transactions Act No. 19 of 2006
B. Computer Crimes Act No. 24 of 2007
C. Personal Data Protection Act No. 9 of 2022
D. Intellectual Property Act No. 36 of 2003
E. Education Act

3. An email asking you to “verify your PIN” through a strange link is:

A. Plagiarism
B. Phishing
C. Validation
D. Copyright
E. E-commerce

4. Copying an essay from a website and submitting it as your own is:

A. Phishing
B. Piracy
C. Plagiarism
D. Hacking
E. E-waste

5. Installing one licensed copy of software on 30 computers without permission is:

A. Software piracy
B. Open source use
C. Plagiarism
D. E-governance
E. Verification

6. How many Sustainable Development Goals are there?

A. 20
B. 8
C. 15
D. 17
E. 10

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

7. The SDGs were agreed by the United Nations in:

A. 2020
B. 2010
C. 2000
D. 2030
E. 2015

8. Which material in e-waste is harmful?

A. Cotton
B. Water
C. Lead
D. Salt
E. Oxygen

9. The gap between people with and without ICT access is the:

A. Bandwidth
B. Digital divide
C. Data life cycle
D. Firewall
E. Batch gap

10. Which helps reduce the digital divide in Sri Lanka?

A. Software piracy
B. Closing school labs
C. Nenasala community centres
D. Content only in English
E. Higher data prices

11. Medical records seen only by the doctor and patient show:

A. Piracy
B. E-waste
C. Plagiarism
D. Confidentiality
E. Redundancy

12. Eye strain and back pain from long computer use are:

A. Economic benefits
B. Environmental benefits
C. Validation errors
D. Legal issues
E. Health issues

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

13. Which term means: “A person’s right to control information about themselves”?

A. SDGs
B. Privacy
C. Copyright
D. Plagiarism
E. Phishing

14. Which term means: “Information is seen only by people allowed to see it”?

A. Cyberbullying
B. Hacking
C. Software piracy
D. E-waste
E. Confidentiality

15. Which term means: “Fake messages or websites that trick people into giving secrets”?

A. Digital divide
B. Phishing
C. Plagiarism
D. Deepfake
E. Malware

16. Which term means: “Getting into a computer system without permission”?

A. Hacking
B. E-waste
C. Copyright
D. SDGs
E. Privacy

17. Which term means: “Harmful software such as viruses and ransomware”?

A. Software piracy
B. Cyberbullying
C. Digital divide
D. Malware
E. Confidentiality

18. Which term means: “A creator’s legal right to control copying of their work”?

A. Copyright
B. Phishing
C. SDGs
D. Plagiarism
E. Deepfake

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

19. Which term means: “Copying or using software without a valid licence”?

A. E-waste
B. Cyberbullying
C. Software piracy
D. Hacking
E. Privacy

20. Which term means: “Presenting another person’s work as your own”?

A. Malware
B. Confidentiality
C. Digital divide
D. Deepfake
E. Plagiarism

Structured Questions

1. Discuss three benefits and three issues of ICT for society. *(6 marks)*

> Benefits – fast communication; better education and health; new jobs; issues – cyberbullying and addiction; job loss from automation; e-waste

2. A student gets this SMS: “Your account is blocked. Click bank-lk-verify.xyz and enter your PIN within 1 hour.” (a) Name this attack. (b) Give three signs. (c) State what the student should do. *(5 marks)*

> (a) Phishing; (b) urgent threat; strange web address; asks for a PIN; (c) do not click and call the bank on its official number

3. Name four Sri Lankan laws related to ICT with their numbers and years, and state what each covers. *(4 marks)*

> Intellectual Property Act No. 36 of 2003 – protects copyright, patents and trademarks; Electronic Transactions Act No. 19 of 2006 – electronic documents and signatures are legal; Computer Crimes Act No. 24 of 2007 – unauthorised access, hacking and data damage are crimes; Personal Data Protection Act No. 9 of 2022 – organisations must protect personal data

4. Explain what e-waste is, why it is harmful and three ways to manage it. *(5 marks)*

> Old or broken electronic equipment; contains lead, mercury and cadmium that pollute soil and water; reduce by repairing; reuse by donating; recycle through approved collectors

© 2026 schoolict.net (Ruwan Mangala Suraweera) · All rights reserved

5. Define the digital divide, give two causes and suggest two ways ICT can help reach the SDGs while reducing it. *(5 marks)*

> Gap between people with and without ICT access and skills; causes – cost of devices and data; no rural coverage; ways – e-learning in rural schools supports Goal 4; telemedicine via Nenasala supports Goal 3

Summary

- ICT brings fast communication, better services and new jobs.
- Issues: social, economic, environmental, health, ethical and legal.
- Protect privacy and confidentiality; watch out for phishing.
- Respect copyright; avoid piracy and plagiarism; use licensed software.
- Manage e-waste, support the SDGs and reduce the digital divide.

MCQ answer key – 1.7

1. **D** – IP law covers copyright.
2. **A** – E-transactions.
3. **B** – A trick to steal secrets.
4. **C** – Taking credit for others' work.
5. **A** – Breaks the licence.
6. **D** – Agreed in 2015.
7. **E** – Target year is 2030.
8. **C** – Also mercury and cadmium.
9. **B** – Access + skills gap.
10. **C** – Access in villages.
11. **D** – Only allowed people.
12. **E** – Effects on the body.
13. **B** – Privacy – A person's right to control information about themselves.
14. **E** – Confidentiality – Information is seen only by people allowed to see it.
15. **B** – Phishing – Fake messages or websites that trick people into giving secrets.
16. **A** – Hacking – Getting into a computer system without permission.
17. **D** – Malware – Harmful software such as viruses and ransomware.
18. **A** – Copyright – A creator's legal right to control copying of their work.
19. **C** – Software piracy – Copying or using software without a valid licence.
20. **E** – Plagiarism – Presenting another person's work as your own.

© 2026 schoolict.net (Ruwan Mangala Suraweera). All rights reserved.