EXAM READY INFORMATION TECHNOLOGY

Exam Ready Information Technology

GRADE 8

Study Guide, Worked Examples and Practice Tests for Grade 8



✓ 6 units with clear key ideas, worked examples and “Watch out!” boxes
✓ 90 worked examples and 144+ practice questions at three levels
✓ 120 unit-quiz questions and 3 full mock exams (60 MCQ each)
✓ Diagnostic test · Key Facts Sheet · Top 20 Mistakes · teacher notes

Follows the units and order of the Ethiopian Grade 8 Information Technology textbook

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Exam Ready Information Technology

Grade 8 · Study Guide, Worked Examples and Practice Tests

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First edition, 2026

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This is an independent study guide. It follows the units and order of the Ethiopian Grade 8 Information Technology student textbook, but it is not published or endorsed by the Ministry of Education. All explanations, examples and questions are original. Keep your textbook and your teacher's notes beside this book.

The answers were calculated and checked before printing, but no book is free of errors. If you find a mistake or disagree with an answer, please tell the author on Telegram (@Ermias_Wedaje) and it will be reviewed for the next edition.

How to Use This Book

Each unit follows the same pattern, so you always know where to look.

Key ideas
The rules and facts of the section, short and clear.

Worked examples
Step-by-step solutions. Cover the solution and try first.

⚠ Watch out!
The mistakes students make most often, and the right way.

Practice
Level 1 Basic · Level 2 Standard · Level 3 Challenge.

Unit quiz
20 multiple-choice questions in the style of the national examination.

For the Teacher
Timing, starters, misconceptions, activities and assessment.

For students

- Begin with the Diagnostic Test. It shows which units need the most work.
- Read the key ideas, then study each example with the solution covered.
- Do Level 1 and Level 2 practice for every section; try Level 3 when you are ready.
- Take each quiz in 30 minutes, mark it, and redo every question you got wrong.
- In the last weeks, learn the Key Facts Sheet and the Top 20 Mistakes page, and sit the three mock exams. Their answer keys show which unit each question comes from.

For teachers

- Each unit follows the textbook sections, so the book can sit beside your lessons.
- The “For the Teacher” page gives timing, starters, misconceptions and activities.
- The quizzes and mock exams can be used as class tests; every answer has a short reason.

For parents

- Ask your child to explain one worked example to you each day. Teaching is the best way to learn.
- Look at the quiz score after each unit, and celebrate progress, not only high marks.

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Diagnostic Test · Where Should I Start?

14 questions · 15 minutes. Take this test before you start the book. There are two questions on each unit. Your score only shows you where to spend your time.

1. The first generation of computers used
   A. microprocessors
   B. transistors
   C. vacuum tubes
   D. integrated circuits

2. The fourth generation used
   A. punched cards
   B. microprocessors (VLSI)
   C. vacuum tubes
   D. transistors

3. Which is an input device?
   A. Scanner
   B. Monitor
   C. Speaker
   D. Printer

4. The device that enters speech is the
   A. speaker
   B. monitor
   C. plotter
   D. microphone

5. Windows is
   A. an operating system
   B. a printer
   C. an input device
   D. a word processor

6. Anti-virus software is
   A. a driver
   B. utility software
   C. an input device
   D. hardware

7. The Internet is
   A. a program
   B. a network of networks
   C. one computer
   D. a printer

8. A URL is
   A. the address of a web page
   B. a virus
   C. a keyboard
   D. a browser

9. Ergonomics is the study of
   A. only chairs
   B. only software
   C. only networks
   D. users, their work and their environment

10. Eyestrain is caused by
    A. a headset
    B. long screen use without breaks
    C. good lighting
    D. short breaks

11. FD means
    A. find
    B. fold
    C. forward
    D. fix

12. CS means
    A. clear screen
    B. change size
    C. copy screen
    D. close shape

Unit 1 · Basics of Computer

By the end of this unit you will be able to:

- identify the five generations of computers
- explain the four functions of a computer
- classify computers by size, method of operation and purpose
- list the characteristics of computers

Before you start — check yourself. (a) Which technology marks the first generation? (b) Name the four basic functions of a computer. (c) Which is the most powerful type of computer?
Answers: (a) vacuum tubes (b) input, processing, output, storage (c) supercomputer

Key words: generation · vacuum tube · transistor · integrated circuit · microprocessor · artificial intelligence · supercomputer · analog · hybrid · diligence

How this unit is examined

Question types that appear again and again in Ethiopian model examinations:

- Computer Generations
- Functions and Types of Computer
- Characteristics of Computers

1.1 Computer Generations

Key ideas

- A **generation** is a period of computer development marked by a major technological change. There are **five generations**.
- **1st (1940–1956): vacuum tubes** — huge, costly, needed much electricity and gave off much heat. **2nd (1956–1963): transistors** (invented in 1947). **3rd (1964–1971): integrated circuits (IC)**. **4th (1971–present): microprocessors / VLSI** (very large scale integrated circuits) — small, powerful, cheap; gave rise to the **personal computer**. **5th (present and beyond): artificial intelligence (AI)** and **parallel processing**.
- Each new generation became **smaller, faster, cheaper, more reliable and more powerful**. **Artificial intelligence** is the simulation of human intelligence in machines; the 5th generation aims at machines that can learn and organise themselves.
- **Order to remember:** vacuum tube → transistor → IC → microprocessor → AI.

Example 1.1 — Match

Which technology belongs to the 2nd generation?

Solution. Transistors.

Example 1.2 — Order

Arrange: IC, vacuum tube, AI, transistor, microprocessor.

Solution. Vacuum tube, transistor, IC, microprocessor, AI.

Example 1.3 — Period

In which years did the 3rd generation run?

Solution. 1964–1971.

Example 1.4 — Exam Booster · PC

Which generation gave rise to the personal computer?

Solution. The 4th generation (microprocessor / VLSI).

Example 1.5 — Exam Booster · Trend

State two improvements across generations.

Solution. Smaller size and higher speed (also lower cost).

⚠ Watch out!

× Wrong	✓ Right
The first generation used transistors.	It used vacuum tubes.
The fifth generation used vacuum tubes.	It uses artificial intelligence.
Later generations were bigger.	Later generations were smaller and faster.

Practice 1.1

Level 1 — Basic

1. Which generation used ICs?
2. What is a vacuum tube?
3. How many generations?

Level 2 — Standard

4. When did the 2nd generation run?
5. What does VLSI stand for?
6. What is AI?

Level 3 — Challenge

7. Compare the first and fourth generations.
8. Explain parallel processing.

1.2 Functions and Types of Computer

Key ideas

- **Four basic functions: input** (entering data), **processing** (operations on data), **output** (showing results) and **storage** (saving data). Example: typing two numbers (input), adding them (processing), displaying the sum (output), saving the file (storage).
- **By size, storage and speed: microcomputer** (PC: desktop, laptop, notebook, tablet), **minicomputer**, **mainframe** (banks, airlines, many users) and **supercomputer** (fastest, most powerful: weather forecasting, research, military).
- **By method of operation: analog** (continuous data: speedometer, thermometer), **digital** (discrete data in digits) and **hybrid** (both: a petrol-pump processor, hospital machines).
- **By purpose: special-purpose** (one problem: calculator, ticket machine, traffic control) and **general-purpose** (many problems: PCs).

Example 1.6 — Functions

Name the four functions of a computer.

Solution. Input, processing, output, storage.

Example 1.7 — Size

Which computer type is used by banks and airlines for many users?

Solution. Mainframe.

Example 1.8 — Method

A speedometer works with continuous data. Which type is it?

Solution. Analog.

Example 1.9 — Exam Booster · Purpose

Is a pocket calculator special- or general-purpose?

Solution. Special-purpose.

Example 1.10 — Exam Booster · Hybrid

Give an example of a hybrid computer.

Solution. A petrol-pump processor.

⚠ Watch out!

× Wrong	✓ Right
A supercomputer is a small personal computer.	It is the fastest and most powerful type.
Digital computers process continuous data.	Digital uses discrete values; analog uses continuous.
A calculator is general-purpose.	It is special-purpose.

Practice 1.2

Level 1 — Basic

1. Which function shows results?
2. Name a microcomputer.
3. Is a PC general-purpose?

Level 2 — Standard

4. Which is fastest: mini, mainframe, super?
5. What data do analog computers use?
6. Name a special-purpose computer.

Level 3 — Challenge

7. Classify computers in three ways.
8. Explain how a petrol pump uses hybrid computing.

1.3 Characteristics of Computers

Key ideas

- **Speed:** millions of operations per second. **Accuracy:** correct results if the input and instructions are correct (**garbage in, garbage out**). **Diligence:** it does not tire or lose concentration.
- **Versatility:** it does many different jobs. **Reliability:** it works dependably. **Automation:** once started, it runs a program by itself. **Storage:** it keeps a large amount of data. **Power of remembering:** it recalls stored data exactly.
- **Limits:** a computer has **no IQ** (it cannot think without instructions) and **no feelings** (no emotion, taste or experience).
- **Remember:** a computer is only as good as its instructions and its data.

Example 1.11 — Speed

Which characteristic means millions of operations per second?

Solution. Speed.

Unit 2 · Computer Hardware

By the end of this unit you will be able to:

- identify input devices and their uses
- describe the CPU and memory and storage devices
- identify output devices

Before you start — check yourself. (a) Is a scanner input or output? (b) What is the brain of the computer? (c) Which memory is temporary?
Answers: (a) input (b) the CPU (c) RAM

Key words: input device · keyboard · scanner · OCR · CPU · ALU · RAM · ROM · monitor · printer

How this unit is examined

Question types that appear again and again in Ethiopian model examinations:

- Input Devices
- Processing and Storage Devices
- Output Devices

2.1 Input Devices

Key ideas

- An **input device** sends data into the computer, which understands data as **0 and 1**. Examples: **keyboard, mouse, scanner, microphone, webcam, joystick, light pen, barcode reader, OCR, OMR**.
- **Keyboard keys:** Esc, Backspace, function keys (F1–F12), navigation/editing keys, typing (alphanumeric) keys, **Ctrl**, **Alt**, **Windows** key, directional (arrow) keys and the numeric keypad. **Mouse:** pointing device with left button (select), right button (properties menu) and middle/scroll button.
- **Scanners: OCR** (Optical Character Recognition) reads printed text; **OMR** (Optical Mark Recognition) reads marks, used to **mark exams**; **barcode reader** reads **UPC** codes on products. A **microphone** enters speech; a **joystick** controls games; a **light pen** points on the screen.
- **Remember:** input devices only send data in; they do not show results.

Example 2.1 — Identify

Which device is used to mark multiple-choice exam sheets?

Solution. OMR.

Key Facts Sheet

Learn these by heart. Cover the right-hand side and say each fact from memory.

Unit 1 · Basics of Computer

Generations: vacuum tube 1940–56, transistor 1956–63, IC 1964–71, microprocessor 1971–now, AI

Four functions: input, processing, output, storage

By size: super, mainframe, mini, micro

By method: analog, digital, hybrid

By purpose: general and special

Speed, accuracy, diligence, storage

Unit 2 · Computer Hardware

Input: keyboard, mouse, scanner, microphone

CPU: ALU calculates, control unit directs, registers hold

RAM temporary ; ROM permanent ; CMOS keeps settings

Storage: hard disk, flash disk, CD, DVD

Output: monitor (soft copy), printer (hard copy)

8 bits = 1 byte ; 1 KB = 1 024 B

Unit 3 · Computer Software

System software: OS, utilities, drivers

OS examples: Windows, Linux, macOS, Android

Application: Word, Excel, PowerPoint

Excel formula starts with = ; =SUM(A1:A5)

Cell = row and column intersection

PowerPoint: slides for presentations

Unit 4 · Internet

Network = connected computers

URL = web address ; HTTP web pages ; FTP files

Browser: Chrome, Edge ; search engine: Google

Email address contains @

Website = group of web pages ; home page first

Social networks: Facebook, Telegram

Unit 5 · Computer Ergonomics

Ergonomics fits the workplace to the user

Top of the screen at eye level

Knees and elbows about 90°

Feet flat on the floor ; wrists straight

Take regular breaks and rest the eyes

Poor posture: back pain, eye strain, RSI

Unit 6 · LOGO

FD forward ; BK back ; RT right ; LT left

PU pen up ; PD pen down ; CS clear screen

REPEAT n [commands]

TO name ... END defines a procedure

MAKE "x 5 ; :x is the value of x

Regular shape turn = 360 ÷ sides

Mock Examination 1

60 multiple-choice questions · 90 minutes · one mark each. Circle one answer. Mark with the answer key at the back and use the unit number to see where to revise.

1. The first generation of computers used
   A. microprocessors B. transistors C. vacuum tubes D. integrated circuits

2. The second generation used
   A. ICs B. vacuum tubes C. transistors D. AI

3. The third generation used
   A. vacuum tubes B. integrated circuits C. AI only D. transistors

4. The fourth generation used
   A. punched cards B. microprocessors (VLSI) C. vacuum tubes D. transistors

5. The fifth generation is based on
   A. ICs B. transistors C. vacuum tubes D. artificial intelligence

6. Which generation gave rise to the PC?
   A. Second B. Third C. Fourth D. First

7. Transistors were invented in
   A. 1947 B. 1971 C. 1900 D. 1995

8. Which is NOT a basic function of a computer?
   A. Input B. Processing C. Storage D. Cooking

9. Showing results on a monitor is
   A. processing B. input C. output D. storage

10. Adding two numbers is
    A. output B. processing C. input D. storage

11. Which is an input device?
    A. Scanner B. Monitor C. Speaker D. Printer

12. OMR is used to
    A. print drawings B. store data C. mark multiple-choice exams D. play sound

13. A barcode reader reads
    A. voice B. images only C. colours D. UPC codes

14. The device that enters speech is the
    A. speaker B. monitor C. plotter D. microphone

15. The middle mouse button is mainly used for
    A. typing B. scrolling C. printing D. saving