EXAM READY INFORMATION TECHNOLOGY

Exam Ready Information Technology

GRADE 10

Study Guide, Worked Examples and Practice Tests for the Grade 10 Examination



✓ 6 units with clear key ideas, worked examples and “Watch out!” boxes
✓ 120 worked examples and 192+ 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 10 Information Technology textbook

ERMIAS WEDAJE TEGBARU

Exam Ready Information Technology

Grade 10 · Study Guide, Worked Examples and Practice Tests

By Ermias Wedaje Tegbaru
Civil engineer and author, Addis Ababa
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This is an independent study guide. It follows the units and order of the Ethiopian Grade 10 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. A folder is used to
   A. hold files and other folders
   B. print documents
   C. connect to the Internet
   D. run programs

2. 1 GB equals
   A. 100 MB
   B. 1 MB
   C. 1000 KB
   D. 1024 MB

3. A transmission medium
   A. stores files
   B. protects the screen
   C. carries data from sender to receiver
   D. prints pages

4. Fibre-optic cables carry
   A. electric current
   B. sound waves
   C. heat
   D. light signals

5. Which is a word processor?
   A. Microsoft Word
   B. Paint
   C. PowerPoint
   D. Excel

6. Ctrl+Z
   A. saves
   B. pastes
   C. copies
   D. undoes an action

7. Multimedia combines
   A. text, audio, images, video and animation
   B. only audio
   C. only video
   D. only text

8. An image 800 × 600 pixels has
   A. 4800 pixels
   B. 480 000 pixels
   C. 48 000 pixels
   D. 1400 pixels

9. CIA in security stands for
   A. Confidentiality, Integrity, Availability
   B. Control, Input, Alarm
   C. Computer, Internet, Access
   D. Copy, Insert, Add

10. Availability means data is
    A. deleted
    B. encrypted only
    C. accessible when needed
    D. hidden

11. An algorithm is
    A. a printer
    B. hardware
    C. a step-by-step solution to a problem
    D. a virus

Unit 1 · Organization of Files

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

- explain file management and the parts of a file name
- identify storage drives and common file extensions
- describe the directory structure and read a file path
- explain file conversion, importing and exporting
- describe saving, backup, recovery, compression, deleting and restoring files

Before you start — check yourself. (a) What is a folder? (b) In "report.docx", what is the extension? (c) Where do deleted files go first in Windows?
Answers: (a) a container that holds files (b) docx (c) the Recycle Bin

Key words: file · folder · extension · path · root directory · backup · compression · conversion · Recycle Bin · cloud drive

How this unit is examined

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

- File Management and Storage Drives
- File Name Extensions and Directory Structure
- Conversion, Importing and Exporting, Saving
- Backup, Compression, Deleting and Restoring

1.1 File Management and Storage Drives

Key ideas

- A **file** is the basic unit of storage; a **folder (directory)** holds files and other folders (sub-folders). **File management** = creating, naming, organising, copying, moving, deleting and protecting files.
- A file name has two parts separated by a period: the **main name** and the **extension** (e.g. **letter.docx**).
- **Storage drives:** internal **hard disk (HDD)** and **solid state drive (SSD)** (usually **C:**), **optical drives** (CD, DVD, last letter such as E:), **flash disks (USB)**, memory cards, external drives and **cloud drives** (Google Drive, OneDrive: web storage accessed through the Internet, good for backup).
- **Units of storage:** 1 byte = 8 bits; 1 KB = 1024 B; 1 MB = 1024 KB; 1 GB = 1024 MB; 1 TB = 1024 GB.
- **Good practice:** meaningful names, one folder per topic, avoid special characters (\ / : * ? " < > |), keep backups.

Example 1.1 — Parts of a name

Name the parts of “Grade10_Biology.pdf”.

Solution. Main name: Grade10_Biology; extension: pdf.

Example 1.2 — Storage units

How many MB are in 2 GB?

Solution. 2 × 1024 = **2048 MB**.

Example 1.3 — Space check

A flash disk of 4 GB holds files of 900 MB, 1.5 GB and 700 MB. How much space is free?

Solution. 900 MB + 700 MB = 1600 MB = 1.5625 GB; plus 1.5 GB = 3.0625 GB; free = 4 − 3.0625 = **0.9375 GB** (about 960 MB).

Example 1.4 — Exam Booster · Invalid name

Why is “my:file?.txt” an invalid file name?

Solution. It contains the forbidden characters : and ?.

Example 1.5 — Exam Booster · Cloud

Give one advantage and one disadvantage of cloud storage.

Solution. Access from any device and safe backup; it needs an Internet connection.

⚠ Watch out!

× Wrong	✓ Right
The extension is part of the main name that you can change freely.	Changing the extension can make the file unusable.
The C: drive is always a flash disk.	C: is usually the internal hard drive.
1 KB = 1000 bytes in computer memory counts.	Computers use 1 KB = 1024 bytes.

Practice 1.1

Level 1 — Basic

1. Define a file.
2. What is a folder?
3. Name one cloud drive.

Level 2 — Standard

4. Convert 3 GB to MB.
5. What is the drive letter of the main hard disk?

6. Name two parts of a file name.

Level 3 — Challenge

7. Explain good file-naming practice.
8. Compare cloud and USB storage.

1.2 File Name Extensions and Directory Structure

Key ideas

- The **extension** shows the **file type** and which application opens it. **Documents:** .docx/.doc (Word), .pdf, .txt. **Spreadsheets:** .xlsx/.xls, .csv. **Presentations:** .pptx. **Images:** .jpg/.jpeg, .png, .gif, .bmp. **Audio:** .mp3, .wav. **Video:** .mp4, .avi. **Compressed:** .zip, .rar. **Programs:** .exe. **Web:** .html.
- **Directory structure:** a **tree** with the **root directory** (e.g. C:\) at the top, then folders and sub-folders. A **path** gives the exact location: **C:\Users\Abebe\Documents\Report.docx**. An **absolute path** starts at the root; a **relative path** starts from the current folder.
- **Parent and child:** in C:\School\Grade10\ICT, "Grade10" is the parent of "ICT". The path separator in Windows is "\".
- **Operations:** create, rename, copy (Ctrl+C, Ctrl+V), move/cut (Ctrl+X, Ctrl+V), delete, search.

Example 1.6 — Match

Match types: .mp3, .xlsx, .pptx, .zip.

Solution. Audio; spreadsheet; presentation; compressed archive.

Example 1.7 — Read a path

In D:\Exams\Maths\mock1.pdf, give the drive, folders and file.

Solution. Drive D:; folders Exams and Maths; file mock1.pdf.

Example 1.8 — Build a path

File notes.txt is in folder Unit1 inside Biology on drive E:. Write the path.

Solution. E:\Biology\Unit1
otes.txt.

Example 1.9 — Exam Booster · Which program

Which program would you use to open a file named budget.xlsx?

Solution. A spreadsheet program such as Excel.

Example 1.10 — Exam Booster · Parent

Name the parent folder of Unit1 in the path above.

Solution. Biology.

Unit 3 · Application Software

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

- perform word processing tasks (formatting, tables, page layout)
- use spreadsheet formulas, functions, cell references and charts
- create and present slides in a presentation program
- choose a suitable application for a task

Before you start — check yourself. (a) Name a word processor. (b) What is a cell in a spreadsheet? (c) What is a slide?
Answers: (a) Microsoft Word (b) the intersection of a row and a column (c) a single page of a presentation

Key words: word processor · formatting · table · spreadsheet · cell reference · formula · function · chart · slide · animation

How this unit is examined

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

- Word Processing
- Spreadsheet Basics and Formulas
- Functions, References and Charts
- Presentation Software

3.1 Word Processing

Key ideas

- **Word processing** = creating, editing, formatting, saving and printing documents (Microsoft Word, LibreOffice Writer, Google Docs).
- **Text formatting:** font, size, **bold (Ctrl+B)**, *italic (Ctrl+I)*, underline (Ctrl+U), colour, alignment (left, centre, right, justify), line spacing, bullets and numbering. **Page layout:** margins, orientation (portrait/landscape), size, columns, headers and footers, page numbers.
- **Tables:** Insert → Table (rows × columns); merge/split cells, resize rows and columns, borders and shading, Layout and Design tabs. **Other:** pictures, shapes, **spelling and grammar check**, find and replace, **mail merge**, print preview, **Ctrl+C/X/V/Z/Y**.
- **Editing keys:** Delete removes the character to the right; Backspace to the left; Ctrl+A selects all; Ctrl+F finds.

Unit 5 · Information and Computer Security

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

- define computer security, information security, privacy and cyber security
- explain confidentiality, integrity and availability
- identify computer security threats (malware, hacking, phishing)
- apply threat prevention strategies (passwords, accounts, antivirus, backups)
- describe the impact of security on society and ethical use

Before you start — check yourself. (a) Why do we use passwords? (b) What is a virus? (c) Name an antivirus program.
Answers: (a) to stop unauthorised access (b) a harmful program that spreads and damages files (c) e.g. Avast, Kaspersky

Key words: confidentiality · integrity · availability · privacy · threat · malware · phishing · firewall · antivirus · cyber security

How this unit is examined

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

- Computer Security and Privacy
- Threats to Computer Security
- Threat Prevention Strategies
- Cyber Security and Society

5.1 Computer Security and Privacy

Key ideas

- **Computer (information) security** = controls that protect **data, software, hardware and firmware**. **CIA triad: Confidentiality** (only authorised people see data), **Integrity** (data is accurate and not modified without permission), **Availability** (systems and data are available when needed).
- **Lack of confidentiality** = unauthorised disclosure or access; **lack of integrity** = unauthorised modification or damage; **lack of availability** = **denial of service**.
- **Privacy** = the right of individuals to control how their personal information is collected, stored and used (**data privacy**). Security protects data; privacy is about **rights** over personal data. A **threat** is any act or event that could cause a security failure; a **vulnerability** is a weakness; **risk** = chance and impact.
- **Impact on society:** protects people's money, identity and health records; builds trust in e-commerce, e-government and mobile money; failures cause financial loss, identity theft, loss of life in critical systems and loss of reputation.

Unit 6 · Fundamentals of Programming

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

- define an algorithm and state its characteristics
- represent an algorithm as a flowchart and as pseudocode
- use sequence, selection and iteration in algorithms
- trace an algorithm to find its output
- describe an IDE and its common tools

Before you start — check yourself. (a) What is a program? (b) Name one programming language. (c) What is the first step of solving any problem?
Answers: (a) a set of instructions for a computer (b) e.g. Python or Java (c) understand the problem

Key words: algorithm · program · flowchart · pseudocode · sequence · selection · iteration · variable · IDE · debugging

How this unit is examined

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

- Algorithms and Their Characteristics
- Flowcharts and Pseudocode
- Control Structures and Tracing
- Integrated Development Environment

6.1 Algorithms and Their Characteristics

Key ideas

- An **algorithm** is a precise, finite sequence of **unambiguous, step-by-step instructions** that solves a problem. A **program** is an algorithm written in a programming language. Algorithms are **language-independent**.
- **Problem solving steps:** understand the problem → identify **input, process, output** → design the algorithm → code it → **test and debug** → document.
- **Characteristics: clear and unambiguous**; **well-defined inputs**; **well-defined outputs**; **finite** (ends after a limited number of steps); **feasible** (can actually be done with available resources); **language-independent**; **effective** (every step is basic and can be done).
- **Example (everyday):** making tea: boil water → add tea → wait 3 min → pour → add sugar. Each step is clear, ordered and finite.

Key Facts Sheet

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

Unit 1 · Organization of files

File name = main name . extension

1 KB = 1024 B ; 1 MB = 1024 KB ; 1 GB = 1024 MB

Path: C:\Folder\Sub\file.ext

Import = in ; export = out

Backup rule 3-2-1

Delete → Recycle Bin ; Shift+Delete permanent

Unit 2 · Computer network

Guided: twisted pair, coaxial, fibre

Unguided: radio, microwave, infrared

PAN, LAN, MAN, WAN

Cellular: cells, base stations, handoff

GEO 36 000 km ; LEO lowest delay

IPv4 32 bits (0–255 parts) ; IPv6 128 bits

Unit 3 · Application software

Ctrl+B, I, U, C, V, X, Z, S

Cell = column letter + row number

Formula starts with = ; order: brackets, powers, × ÷, + −

SUM, AVERAGE, MAX, MIN, COUNT, IF

Absolute A1 ; relative A1

Line = trend ; pie = parts of a whole

Unit 4 · Multimedia

Multimedia: text, audio, image, video, animation

Raster = pixels ; vector = shapes

JPEG lossy ; PNG transparent ; GIF animation

MP3 compressed ; WAV uncompressed

Frames = seconds × fps

Stages: plan, design, create, author, test, deliver

Unit 5 · Security

CIA: confidentiality, integrity, availability

Virus needs host ; worm spreads alone ; Trojan disguised

Phishing: fake messages

Strong password: long and mixed

Antivirus + firewall + updates + backups

Never share OTP or PIN

Unit 6 · Programming

Algorithm: finite, clear, input, output

Oval start/end ; diamond decision ; parallelogram I/O ; rectangle process

Sequence, selection, iteration

Errors: syntax, runtime, logic

IDE: editor, compiler, debugger

Compiler = whole ; interpreter = line by line

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. A folder is used to
   A. hold files and other folders
   B. print documents
   C. connect to the Internet
   D. run programs

2. In “notes.docx” the extension is
   A. notes
   B. notes.docx
   C. docx
   D. .

3. The extension shows the
   A. file date
   B. file type
   C. file owner
   D. file size

4. 1 GB equals
   A. 100 MB
   B. 1 MB
   C. 1000 KB
   D. 1024 MB

5. 2 GB equals how many MB?
   A. 2048
   B. 200
   C. 2000
   D. 1024

6. The main hard disk is usually drive
   A. K:
   B. Z:
   C. C:
   D. A:

7. A cloud drive is accessed through the
   A. CD tray
   B. Internet
   C. printer
   D. keyboard

8. Which is a cloud drive?
   A. Notepad
   B. Recycle Bin
   C. Google Drive
   D. Paint

9. The extension for a Word document is
   A. .xlsx
   B. .docx
   C. .mp3
   D. .pptx

10. The extension for a spreadsheet is
    A. .docx
    B. .png
    C. .xlsx
    D. .zip

11. A transmission medium
    A. stores files
    B. protects the screen
    C. carries data from sender to receiver
    D. prints pages

12. Which is a guided medium?
    A. microwaves
    B. twisted-pair cable
    C. radio waves
    D. infrared

13. Which is an unguided medium?
    A. fibre-optic cable
    B. twisted pair
    C. radio waves
    D. coaxial cable

14. Fibre-optic cables carry
    A. electric current
    B. sound waves
    C. heat
    D. light signals