EXAM READY INFORMATION TECHNOLOGY

Exam Ready Information Technology

GRADE 9

Study Guide, Worked Examples and Practice Tests for the Grade 9 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 9 Information Technology textbook

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Exam Ready Information Technology

Grade 9 · Study Guide, Worked Examples and Practice Tests

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This is an independent study guide. It follows the units and order of the Ethiopian Grade 9 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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Page numbers are the numbers shown at the foot of each page (and in the online reader).

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 file is
   A. a type of printer
   B. a collection of similar data stored in a computer
   C. a container only for folders
   D. a Windows key

2. A folder is used to
   A. group related files
   B. connect to Wi-Fi
   C. delete the disk
   D. print files

3. A computer network is
   A. a printer only
   B. two or more connected devices
   C. a single cable
   D. one lonely computer

4. A protocol is
   A. a router
   B. a screen
   C. a set of communication rules
   D. a cable

5. Ctrl + L aligns text
   A. justified
   B. right
   C. centre
   D. left

6. Ctrl + J aligns text
   A. left
   B. justified
   C. centre
   D. right

7. A pixel is
   A. a file name
   B. the smallest dot of an image
   C. a layer
   D. a whole photo

8. Multimedia includes
   A. paper
   B. audio only
   C. text only
   D. text, audio, video and images

9. Information security protects
   A. only paper
   B. only chairs
   C. only printers
   D. information and systems

10. The A in CIA is
    A. attack
    B. availability
    C. access
    D. antivirus

11. A problem is
    A. a cable
    B. a situation needing a solution
    C. a printer
    D. a drive

12. A good algorithm is
    A. endless
    B. random
    C. vague
    D. finite

Unit 1 · Organization of Files

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

- explain file, folder and drive
- use File Explorer to navigate
- create, copy, move, rename, delete, restore and search files and folders
- describe computer drives

Before you start — check yourself. (a) What is a folder? (b) Which shortcut opens File Explorer? (c) Name one removable drive.
Answers: (a) a container for files and other folders (b) Windows key + E (c) a flash disk

Key words: file · folder · File Explorer · navigation pane · quick access · extension · Recycle Bin · static drive · removable drive · path

How this unit is examined

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

- Files and Folders
- File Explorer and Navigation
- Managing Files and Folders
- Computer Drives

1.1 Files and Folders

Key ideas

- A **file** is a **collection of similar data stored in a computer**, like a paper file used to keep student or teacher data. A file can be a **document, picture, audio, video or application**; each file type has its own **icon** and **extension** (for example .docx, .xlsx, .jpg, .mp3, .txt).
- A **folder** is like a manila folder: a **container of files and other folders**. Folders help us **organise similar files together** so they can be found easily. Folders have **no extension**.
- **Why organise files:** to locate, search and share files quickly; to group similar files; to **delete unwanted files** and free space; and to protect important data. Organisations keep payroll, customer and plan files in computerised or manual systems.
- **Limits of manual filing** (shelves and cabinets, for example an **idir or iqub** membership record): slow searching, damage, lost papers and no backup, which computers solve.

Example 1.1 — Define

What is a file?

Solution. A collection of similar data stored in a computer.

Example 1.2 — Classify

Which is a folder and which is a file: “Grade9” and “marks.xlsx”?

Solution. Grade9 is a folder; marks.xlsx is a file.

Example 1.3 — Extension

What type of file ends with .mp3?

Solution. An audio file.

Example 1.4 — Exam Booster · Why

Give two reasons for organising files in folders.

Solution. Easy to find and to keep similar files together.

Example 1.5 — Exam Booster · Manual

Give one limit of a paper filing cabinet.

Solution. Searching is slow and papers can be lost.

⚠ Watch out!

× Wrong	✓ Right
A folder has an extension like .docx.	Folders have no extension; files do.
A file can only be a document.	It can be a picture, audio, video or application.
Organising files wastes time.	It saves time when searching.

Practice 1.1

Level 1 — Basic

1. Define a folder.
2. Name a file type.
3. Does a folder have an extension?

Level 2 — Standard

4. What extension is a Word file?
5. What is an icon?
6. Why group files?

Level 3 — Challenge

7. Explain the difference between a file and a folder.
8. Discuss why file organisation is important.

1.2 File Explorer and Navigation

Key ideas

- **File Explorer** is the application used in Windows to manage files and folders. **To open it:** click its shortcut on the taskbar or desktop; type "File Explorer" after clicking **Start**; or press **Windows key + E**.
- **Navigation pane** (left side) shows files and folders in a **hierarchical tree structure**. **Quick access** gives fast links to **Desktop, Downloads, Documents, Pictures** and frequently used folders; browsers save downloads in the **Downloads** folder by default. The pane also shows **OneDrive, This PC and Network**.
- **Ways to navigate:** type a path in the **Address bar**; use the **Forward and Back** buttons; click folders in the **navigation pane** (the small triangle opens sub-folders); use the **Search box** at the right of File Explorer.
- **Views and sorting:** change the view (icons, list, details) and sort by name, date, type or size.

Example 1.6 — Open

Give three ways to open File Explorer.

Solution. Taskbar shortcut, search from Start, and Windows key + E.

Example 1.7 — Quick

Where are photos you saved from the internet usually found?

Solution. In the Pictures folder (downloads are in Downloads).

Example 1.8 — Navigate

Name three ways to navigate to a folder.

Solution. Address bar, navigation pane and search box.

Example 1.9 — Exam Booster · Pane

What does the navigation pane show?

Solution. Files and folders as a tree.

Example 1.10 — Exam Booster · Sort

How can you find the largest file in a folder?

Solution. Use the Details view and sort by size.

Unit 2 · Computer Network

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

- define a computer network
- identify the fundamental elements of a network
- classify networks by size, topology and resource sharing
- state the advantages and disadvantages of networks

Before you start — check yourself. (a) Name two devices that can be connected to a network. (b) What do we use a network for? (c) Name a wireless connection you use.
Answers: (a) computer and phone (b) sharing data and communicating (c) Wi-Fi or Bluetooth

Key words: network · end device · switch · router · NIC · protocol · LAN · WAN · topology · client-server

How this unit is examined

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

- Definition and Elements of a Network
- Network Devices and Media
- Types of Networks
- Advantages and Disadvantages of Networks

2.1 Definition and Elements of a Network

Key ideas

- A **computer network** is the **interconnection of two or more computers or devices** able to communicate and share resources. Networks give us email, online newspapers, blogs, chat and other Internet services.
- **Fundamental elements: end devices**, **intermediate devices**, **connection media** and **protocols**.
- **End devices** are the **sender and receiver** of messages: any device that can compose, send and receive a message (computer, phone, printer, server). **Intermediate devices** sit between end devices and connect them (network cards, switches, routers, modems, repeaters).
- **Protocol:** a common set of **rules** that manages communication (packet transmission) through a network, for example HTTP, TCP/IP and Ethernet.

Example 2.1 — Define

What is a computer network?

Solution. The interconnection of two or more devices that can communicate and share resources.

Unit 4 · Image Processing and Multimedia

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

- define image, pixel and multimedia
- plan a multimedia product with a storyboard
- edit images with basic Photoshop tools
- use layers

Before you start — check yourself. (a) What is a pixel? (b) Name two media types. (c) Name an image editing program.
Answers: (a) the smallest dot of a digital image (b) text and audio (c) Adobe Photoshop

Key words: image · pixel · multimedia · storyboard · crop · resize · red-eye · sharpening · layer · levels

How this unit is examined

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

- Digital Images and Multimedia
- Basic Photoshop Editing: Crop, Resize and Red-eye
- Colour, Tone and Sharpening
- Working with Layers

4.1 Digital Images and Multimedia

Key ideas

- A **digital image** is a picture stored as a grid of tiny squares called **pixels** (picture elements). Each pixel holds colour information stored in **bits**: more bits per pixel allow more colours; more pixels give better detail (**resolution**).
- **Multimedia** is the combination of **text, images, audio, video and animation** in one product (a website, e-book, game, video lesson). It is usually **interactive**.
- **Storyboard:** a series of sketches or frames, with notes, that plan a multimedia project before making it: what appears on each screen, the sound, the text and the order. It saves time and avoids mistakes.
- **Uses:** education, advertising, entertainment, news and training.

Example 4.1 — Define

What is a pixel?

Solution. The smallest dot (picture element) of a digital image.

Unit 5 · Information and Computer Security

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

- explain confidentiality, integrity and availability
- identify threats to information and computers
- describe common attacks and their effects
- apply protection methods and good practices

Before you start — check yourself. (a) Name one computer threat. (b) What does an antivirus do? (c) Why use a strong password?
Answers: (a) virus or hacker (b) detects and removes malware (c) to stop others guessing it

Key words: confidentiality · integrity · availability · malware · phishing · firewall · antivirus · social engineering · DoS · password

How this unit is examined

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

- Principles of Security: the CIA Triad
- Threats and Attacks
- Losses Caused by Security Breaches
- Protecting Information and Computers

5.1 Principles of Security: the CIA Triad

Key ideas

- **Information security** protects information and computer systems from unauthorised access, change or destruction. Its three goals form the **CIA triad**.
- **Confidentiality:** only **authorised people** can read the information (passwords, encryption).
  Integrity: information stays **accurate and unaltered** unless changed by authorised users.
  Availability: information and systems are **accessible when needed** by authorised users.
- **Examples:** a student mark sheet visible only to the teacher (confidentiality); a mark that cannot be secretly changed (integrity); the school system working on result day (availability).
- **Threat types: natural** (fire, flood, earthquake, lightning) and **man-made** (hackers, malware, mistakes). About **90%** of problems come from **user practice** (weak passwords, clicking bad links).

Example 5.1 — Define

State the three parts of the CIA triad.

Solution. Confidentiality, integrity and availability.

Key Facts Sheet

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

Unit 1 · Organization of files

File = similar data ; folder = container (no extension)

Open File Explorer: Windows + E

Rename F2 ; Copy Ctrl+C ; Cut Ctrl+X ; Paste Ctrl+V

Delete → Recycle Bin ; Shift+Delete permanent

Static: HDD, SSD ; removable: flash disk, CD

Downloads folder saves web downloads

Unit 2 · Computer network

Elements: end devices, intermediate devices, media, protocols

Hub broadcasts ; switch forwards ; router connects networks

Wired: UTP, fibre ; wireless: radio, microwave, infrared

PAN, LAN, MAN, WAN

Bus, star, ring, mesh

Peer-to-peer vs client-server

Unit 3 · Application software

Align: Ctrl+L left, E centre, R right, J justify

Page break: Ctrl+Enter

Header top ; footer bottom

Formula starts with = ; SUM, AVERAGE

Relative A1 changes ; absolute A1 fixed (F4)

PowerPoint views: Normal, Outline, Slide Sorter, Reading ; F5 shows

Unit 4 · Image and multimedia

Pixel = smallest dot of an image

Multimedia: text, image, audio, video, animation

Storyboard plans screens before making

Crop, resize (lock aspect ratio), red-eye tool

Shadows dark ; midtones medium ; highlights bright

Layer = transparent sheet ; Ctrl+J duplicates ; PSD keeps layers

Unit 5 · Security

CIA: confidentiality, integrity, availability

Natural vs man-made threats ; 90% from user practice

Malware, DoS, phishing, MITM, eavesdropping, SQL injection

Social engineering targets people

Firewall + antivirus + updates + backups

Strong password: long and mixed

Unit 6 · Programming

Algorithm: finite, clear, correct

Steps: define, design, code, test, document

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

Sequence, selection, iteration

Flowgorithm runs flowcharts ; Scratch: sprite, stage, repeat, forever

Top-down: whole to parts ; bottom-up: parts to whole ; modules

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 file is
   A. a type of printer
   B. a collection of similar data stored in a computer
   C. a container only for folders
   D. a Windows key

2. Which is a folder name?
   A. photo.jpg B. song.mp3 C. Grade9 D. marks.xlsx

3. The extension .mp3 shows an
   A. image file B. document C. video file D. audio file

4. A folder is used to
   A. group related files B. connect to Wi-Fi
   C. delete the disk D. print files

5. Organising files helps you
   A. slow the computer B. lose data
   C. find them quickly D. avoid saving

6. Which key combination opens File Explorer?
   A. Windows + E B. Shift + Tab C. Alt + F4 D. Ctrl + P

7. The left side of File Explorer is the
   A. navigation pane B. ribbon only
   C. title bar D. status bar

8. Quick access gives links to
   A. only the Internet B. only printers
   C. frequently used folders D. only viruses

9. Web downloads normally go to
   A. Downloads B. Music C. Recycle Bin D. Videos only

10. The F2 key is used to
    A. rename a file B. delete a file C. open Word D. copy a file

11. A computer network is
    A. a printer only B. two or more connected devices
    C. a single cable D. one lonely computer

12. Which is an end device?
    A. switch B. router C. repeater D. computer

13. Which is an intermediate device?
    A. phone B. printer C. laptop D. router