Grade 7 Computing

Unit 1 · Inside the Computer

ANSWER KEY · FOR TEACHERS

Full marks 35

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 Key words

1. motherboard
2. processor
3. cores
4. RAM
5. volatile
6. Storage
7. port
8. driver

K · 4

Each carries 0.5 mark.

2 Label the diagram

1. Processor (CPU)
2. Memory (RAM)
3. Storage
4. Output devices

K · 2

Each carries 0.5 mark.

3 Multiple choice

i. **c.** the processor (CPU) — K · 1

The processor carries out the instructions. The motherboard joins the parts, storage keeps programs and files, and the power supply gives the parts electricity.

ii. **b.** It is lost. — K · 1

RAM is volatile: it keeps its data only while it has power. Anything not saved to storage is lost.

iii. **c.** a hard disk drive — U · 1

A hard disk has spinning platters and a moving arm. SSDs, pen drives and memory cards are flash memory, with no moving parts.

iv. **c.** its storage, where apps, photos and files are kept — U · 1

Shops often call a phone's storage "ROM". It is really flash storage that you can fill and change.

v. **b.** It gives each app the processor for a tiny turn, one after the other, very fast. — A · 1

This is scheduling: each app gets a turn of a few thousandths of a second, so both seem to run together.

4 True or false

i. ✓ **True**
ii. ✗ **False:** A hard disk drive has spinning platters; an SSD keeps data in flash memory, with no moving parts.
iii. ✓ **True**
iv. ✗ **False:** A newer design can do more in each tick, so a 2.5 GHz processor can be faster; only processors of the same family compare fairly by GHz.
v. ✓ **True**
vi. ✗ **False:** A pencil doesn't conduct electricity, so it doesn't change the charge in the screen's grid of wires.

U · 3

Each carries 0.5 mark.

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5 Short answers

a. MARKING SCHEME — A · 3

- ✓ i. Still there: it was saved in storage, which keeps its data without power.
- ✓ ii. Lost: the changes were only in memory (RAM), which forgets everything when the power goes.
- ✓ iii. Still there: the program is installed in storage; only the copy running in memory was lost.

b. MARKING SCHEME — U · 2

- ✓ i. HDMI (or USB-C with an adapter); ii. USB-C.
- ✓ iii. the audio jack (3.5 mm); iv. Ethernet.

c. MARKING SCHEME — K · 2

- ✓ Any two sensors, each with what it lets the phone do (accelerometer: turns the picture, counts steps; gyroscope: steadies videos; proximity sensor: screen off at the ear; light sensor: screen brightness; magnetometer: compass; GPS receiver: where you are; fingerprint reader: unlocks the phone).
- ✓ Any two more, each with what it does.

d. MARKING SCHEME — A · 3

- ✓ RAM 6 GB, more than 4 GB: met; version 13 is newer than 12: met.
- ✓ Free storage 2 GB, less than the 3 GB needed: not met, so the game won't install (or will run badly).
- ✓ He can free up space: delete apps he doesn't use, or move photos and videos off the phone.

6 Calculations

a. ANSWER — A · 2

1 GHz is 1,000,000,000 ticks a second, so 2.5 GHz = 2.5 × 1,000,000,000 = **2,500,000,000 ticks** a second.
In a tenth of a second: 2,500,000,000 ÷ 10 = **250,000,000 ticks.**

MARKING SCHEME

- ✓ 2.5 × 1,000,000,000 = 2,500,000,000 ticks a second.
- ✓ 2,500,000,000 ÷ 10 = 250,000,000 ticks in a blink.

b. ANSWER — A · 3

The cheaper one: 15,000 ÷ 2 = **Rs 7,500 a year.**
The dearer one: 24,000 ÷ 6 = **Rs 4,000 a year.**
The dearer phone costs less for each year of safe use, by 7,500 − 4,000 = **Rs 3,500 a year.**

MARKING SCHEME

- ✓ 15,000 ÷ 2 = Rs 7,500 a year.
- ✓ 24,000 ÷ 6 = Rs 4,000 a year.
- ✓ The dearer phone, by Rs 3,500 a year.

7 Long answer

ANSWER

Laptop 1 is the better choice for her:

- It is within the family's budget (Rs 58,000); Laptop 2 is Rs 2,000 over.
- 8 GB of RAM and a recent mid-range processor are enough for typing, spreadsheets and learning to program; Laptop 2's extra speed and RAM would mostly go unused.
- Its battery lasts longer, about 8 hours, which matters at school and in power cuts.
- It is lighter to carry, and it has HDMI and USB-A, so it plugs straight into a projector and older pen drives without adapters.

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MARKING SCHEME **A · 4**

- ✓ Laptop 1, because it is within the budget (Laptop 2 is over it).
- ✓ Its RAM and processor are enough for what she will do with it.
- ✓ Its battery lasts longer (8 hours against 6).
- ✓ Any one more: it is lighter; it has HDMI and USB-A ports, so no adapters are needed.

8 Think

ANSWER **HA · 2**

More cores help when there are many jobs at once, or a job that can be split into parts done at the same time: a video call while a file downloads, or a video being made smaller. A job that must go step by step, each step needing the one before, runs on one core, however many there are, just as one cup of tea needs its steps done in order.

MARKING SCHEME

- ✓ More cores help with many jobs at once (or a job split into parts), such as a video call while a file downloads.
- ✓ They don't help a job that must go step by step, each step needing the one before: it runs on one core.

9 Activity: Find the sensors in your phone

(not marked)

WHAT STUDENTS SHOULD FIND

Covering the earpiece: the screen goes dark; the **proximity sensor** noticed your hand. Turning the phone: the photo turns; the **accelerometer** noticed which way is down. Covering the top: the screen dims when the light is blocked; the **light sensor**. Turning round: the arrow turns with you; the **magnetometer** (compass), with the **GPS receiver** placing you on the map.

Marks by level	Knowledge	Understanding	Application	Higher ability	**Total**
Marks	10	7	16	2	**35**

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