

3 A student has a portable device. He uses an on-screen keyboard to write messages to his friend.

(a) Explain how the text the student writes is converted to binary to be processed.

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..... [3]

(b) The device has 4 gibibytes (GiB) of random access memory (RAM).

(i) State the amount of RAM the device has in mebibytes (MiB).

..... [1]

(ii) State the amount of RAM the device has in tebibytes (TiB). Your answer can be given rounded to 3 decimal places.

..... [1]

Working space

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(c) Explain why the portable device needs RAM.

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..... [3]

(d) The device has a fingerprint scanner to allow the student to unlock the portable device.

Circle only **three** terms that can be used to describe the fingerprint scanner.

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|----------------|--------------|---------------|----------------|
| authentication | biometric | malware | parity check |
| firewall | input device | output device | storage device |

[3]