



Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

Level 3 Technical Level

IT: CYBER SECURITY

IT: NETWORKING

IT: PROGRAMMING

IT: USER SUPPORT

Unit 1 Fundamental principles of computing

Monday 14 January 2019

Morning

Time allowed: 2 hours

Materials

For this paper you must have:

- a ruler
- a scientific calculator (non-programmable)
- stencils or other drawing equipment (eg flowchart stencils).

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.
- If you need more space use the additional pages at the back of this booklet.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80. There are 50 marks in **Section A** and 30 marks in **Section B**.
- Both sections should be attempted.

Advice

- In all calculations, show clearly how you work out your answer.
- Use diagrams, where appropriate, to clarify your answers.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

For Examiner's Use	
Question	Mark
1–5	
6	
7	
8	
9	
10	
11	
12	
13	
TOTAL	



J A N 1 9 Y 5 0 7 6 4 2 4 0 1

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Section A*Do not write
outside the
box*Answer **all** questions in this section.**0 1**Which of the following represents 10^6 bytes?Tick (✓) **one** box.**[1 mark]**

a gigabyte

☐

a kilobyte

☐

a megabyte

☐

a petabyte

☐**0 2**

Which of the following requires a compiler to run?

Tick (✓) **one** box.**[1 mark]**

assembly language

☐

high-level language

☐

machine code

☐

pseudocode

☐

0 3

When a key is pressed, the keyboard controller requests the attention of the central processing unit (CPU).

Which mechanism allows this to happen?

Tick (✓) **one** box.

[1 mark]

interpreter

☐

interrupt

☐

pipeline

☐

sensor

☐**0 4**

In the CPU, which holds the intermediate result of an arithmetic or logic operation?

Tick (✓) **one** box.

[1 mark]

accumulator

☐

instruction register

☐

memory address register

☐

program counter

☐

Turn over for the next question

Turn over ►



0	5
---	---

Which of the following is a characteristic of information?

Tick (✓) **one** box.

[1 mark]

accuracy

☐

capacity

☐

paucity

☐

tenacity

☐

5



0	6
---	---

Characters input from a keyboard are encoded.

0	6	.	1
---	---	---	---

Name **one** common format for encoding characters.

[1 mark]

0	6	.	2
---	---	---	---

Explain why the encoding of characters is required.

[2 marks]

3

Turn over for the next question

Turn over ►



0	7
---	---

Computers use cache memory to increase their speed.

0	7	.	1
---	---	---	---

Explain the difference between Level 1 cache memory and Level 3 cache memory.

[2 marks]

0	7	.	2
---	---	---	---

Explain why computers have less cache memory than Random Access Memory (RAM).

[2 marks]

4

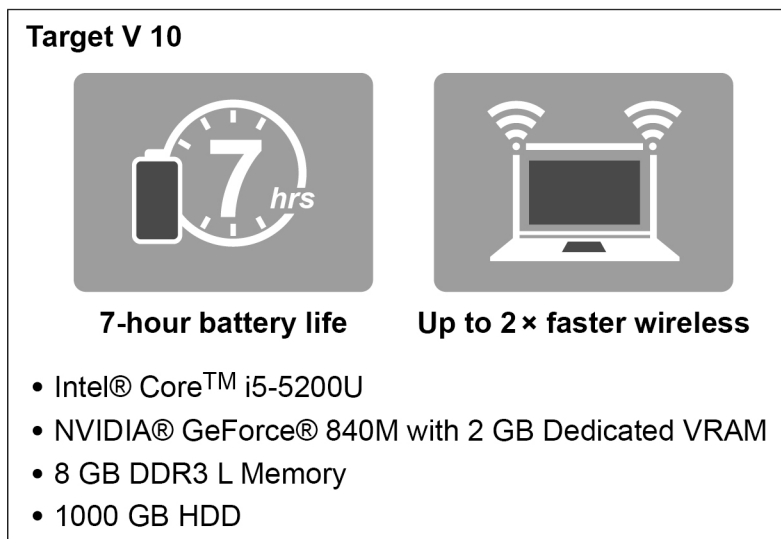


0 8

Storage space on a computer system is expressed in bytes.

Figure 1 shows the label on a computer. It states there are 8 GB of memory (RAM) and a 1000 GB hard disk drive (HDD).

Figure 1



Explain why the number of bytes shown in **Figure 1** might not exactly match the number of bytes shown by system software.

[4 marks]

4

Turn over for the next question

Turn over ►



0 9

To protect a computer room, the door opens only if certain conditions are met. The truth table in **Table 1** shows combinations that allow access.

0 9 . 1Complete **Table 1**.**[1 mark]****Table 1**

Input A	Input B	Input C	Access granted
1	1	1	1
1	1	0	1
1	0	1	1
1	0	0	0
0	1	1	1
			0
			0
			0

0 9 . 2Using **Table 1**, state when access will be granted.**[1 mark]**

0 9 . 3Write a logical expression for the truth table in Question **09.1**.**[3 marks]**



0 9 . 4

The software that controls access to the computer room includes biometrics.

Give **two** examples of biometric devices that could be used to generate suitable inputs in Question **09.1**.

[2 marks]

1 _____

2 _____

0 9 . 5

Explain how biometrics function as a security tool.

[4 marks]

0 9 . 6

Biometric software is used to improve security.

Explain the disadvantages of using biometrics for computer room security.

[4 marks]

15

Turn over for the next question

Turn over ►



1	0
---	---

1 0 . 1

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1	0	.	2
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- 1 _____
- 2 _____

6



1	1
---	---

When computers are operating they generate heat.

1	1	.	1
---	---	---	---

Discuss the advantages and disadvantages of the different ways of cooling computers.

[5 marks]

1	1	.	2
---	---	---	---

Describe what might happen to a computer if it is not cooled.

[2 marks]

Turn over for the next question

7

Turn over ►



1	2
---	---

6

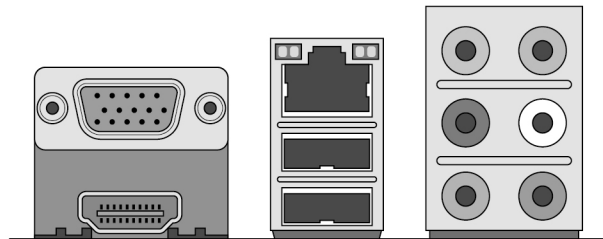


Section BAnswer **all** questions in this section.**1 3**

A friend has asked you for advice on upgrading a computer bought a long time ago.

1 3 . 1**Figure 2** shows some of the ports on the back of the computer.

Draw a line from each named port to the correct port on the diagram.

[4 marks]**Figure 2**

Audio

HDMI

Network

USB

1 3 . 2

Your friend has more universal serial bus (USB) devices than the computer has USB ports.

Suggest how she could attach all the USB devices at the same time.

[2 marks]

Question 13 continues on the next page**Turn over ►**

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1 **3** . **3** Describe **two** differences between USB standards.

[2 marks]

1 3 . 4 Some components within a computer system are called a bus.

Explain where buses can be found and what buses do.

Give examples in your answer.

[6 marks]

[illegible]

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1	3	.	5
---	---	---	---

Your friend wants to increase the storage capacity of her computer. She has asked you to:

- describe the various options available
- discuss advantages and disadvantages of the various options
- explain how the options work when storing data or accessing data.

[16 marks]

[illegible]

Extra space is available on the next page if required

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[illegible]

30



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[illegible]

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[illegible]

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