



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

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 2

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 3

0 5

Which of the following is a characteristic of information?

Tick (✓) **one** box.

[1 mark]

accuracy

capacity

paucity

tenacity

5

0 4

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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



0 5

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Turn over ►

0 | 7

Computers use cache memory to increase their speed.

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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



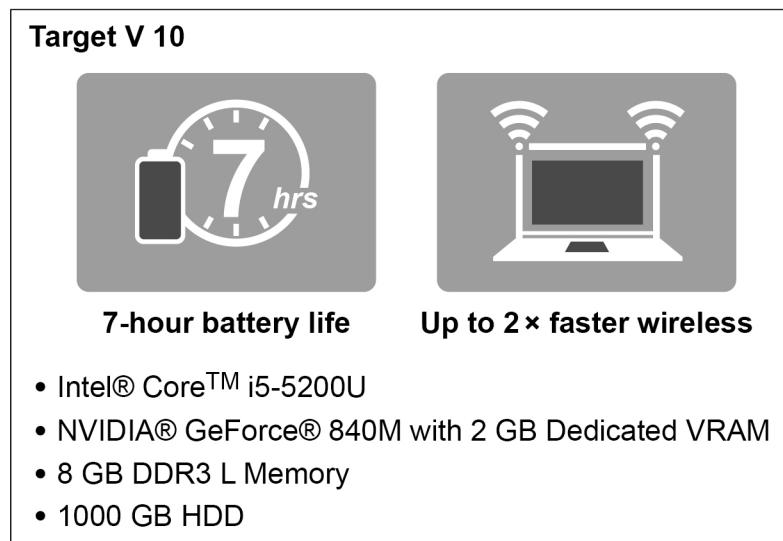
0 8

Storage space on a computer system is expressed in bytes.

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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 7

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 8

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 ►



0 9

10

There are many types of computer in use today.

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10

1. 1 Describe the differences between a supercomputer and a personal computer.

[4 marks]

| | | | |
|---|---|---|---|
| 1 | 0 | . | 2 |
|---|---|---|---|

Give **two** applications a supercomputer might be used for.

[2 marks]

1

1. What is the primary purpose of the study?

?

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

Turn over ►



1 | 2

A further education college uses spreadsheet software for administration.

Describe how spreadsheet software can integrate with other software and data sources to provide useful information for the college.

Give examples in your answer.

[6 marks]

6

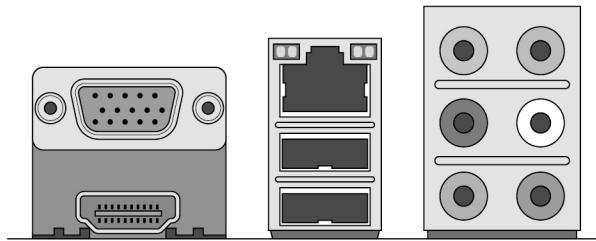


Section BAnswer **all** questions in this section.**1 3**

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 ►**

1 3

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

[2 marks]

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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]

| | | | |
|---|---|---|---|
| 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]

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END OF QUESTIONS

30



If needed, use the following pages to continue your answers. Write the question number beside your answer.

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