AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

GCSE
COMPUTER SCIENCE

Paper 2 Written assessment

Thursday 17 May 2018 Afternoon Time allowed: 1 hour 30 minutes

Materials
There are no additional materials required for this paper.

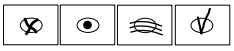
Instructions
- Use black ink or black ball-point pen. Use pencil only for drawing.
- Answer **all** questions.
- You must answer the questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.
- You must **not** use a calculator.

Information
- The total number of marks available for this paper is 80.

For Examiner's Use	
Question	Mark
1–4	
5–6	
7	
8–9	
10	
11	
12	
13	
14	
15	
TOTAL	

Advice

For the multiple-choice questions, completely fill in the lozenge alongside the appropriate answer.

CORRECT METHOD  WRONG METHODS 

If you want to change your answer you must cross out your original answer as shown. 

If you wish to return to an answer previously crossed out, ring the answer you now wish to select as shown. 

Answer **all** questions.

Do not write outside the box

0 1 A bit pattern is shown in **Figure 1**.

Figure 1

10011100

0 1 . 1 Convert the bit pattern shown in **Figure 1** into decimal.

[1 mark]

0 1 . 2 Convert the bit pattern shown in **Figure 1** into hexadecimal.

You should show your working.

[2 marks]

Answer: _____

0 2 Add together the following three binary numbers and give your answer in binary:

```
  01110101
  00100100
+ 00010001
----------
```

[2 marks]

Do not write outside the box

0 3 Put the following capacities into size order (where 1 is the smallest and 4 is the largest).

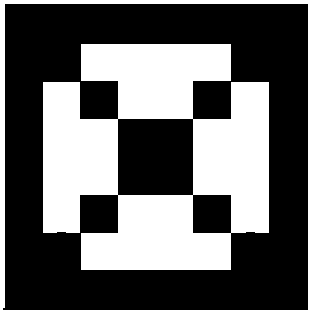
[3 marks]

Capacity	Order (1–4)
0.5 Terabytes	
3500 Kilobytes	
2.5 Gigabytes	
6250 Megabytes	

0 4 **Figure 2** shows an 8 x 8 black and white bitmap image. The image has been represented as a bit pattern with each bit representing a pixel. Row 3 has been represented as 01011010.

Figure 2

Row 1
Row 2
Row 3
Row 4
Row 5
Row 6
Row 7
Row 8



0 4 . 1 What is the binary representation of Row 4 in **Figure 2**?

[1 mark]

Row 4: _____

0 4 . 2 The image in **Figure 2** is going to be changed so that each pixel can be any one of 16 different colours.

What is the **minimum** number of bits that would be needed to represent the entire 16-colour image?

You should show your working.

[2 marks]

_____

_____

_____

_____

11

Turn over ►

Do not write outside the box

0 5 ROM is a type of memory used in computers.

Shade **two** lozenges to show which statements are true about ROM.

[2 marks]

A Desktop computers usually store application software in ROM ⬭

B Desktop computers typically have more ROM than RAM ⬭

C ROM is commonly used to store start-up instructions ⬭

D ROM is non-volatile ⬭

E ROM is used to increase the quality of graphics on a computer ⬭

0 6 Explain how a magnetic hard disk drive (HDD) operates.

[4 marks]

6

Do not write outside the box

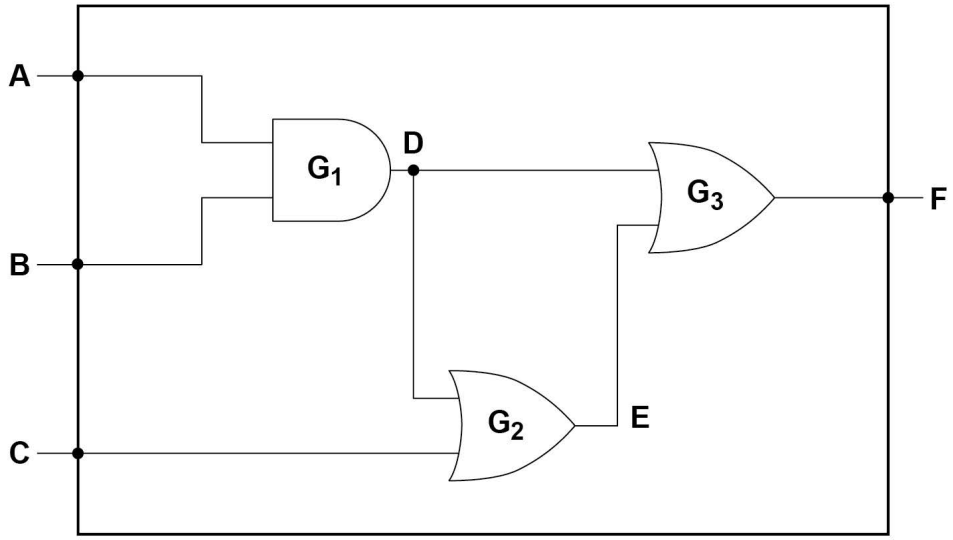
There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

Do not write outside the box

0 7 **Figure 3** shows a logic circuit.

Figure 3



0 7 . 1 State the type of logic gate labelled G_1 in **Figure 3**.

[1 mark]

G_1: _____

0 7 . 2 State the type of logic gate labelled G_2 in **Figure 3**.

[1 mark]

G_2: _____

0 7 . 3 State what a NOT gate does.

[1 mark]

_____

_____

Do not write outside the box

0 7 . 4 Complete the following truth table for the logic circuit shown in **Figure 3** by filling in the grey shaded cells.

[3 marks]

A	B	C	D	E	F
0	0	0	0	0	0
0	0	1	0	1	1
0	1	0	0	0	0
0	1	1	0	1	1
1	0	0			
1	0	1	0	1	1
1	1	0	1		
1	1	1			

6

Turn over for the next question

Do not write outside the box

0 8 . 1 State **three** components of the CPU and describe their purpose.

[6 marks]

Component 1: _____

Description: _____

_____

_____

_____

Component 2: _____

Description: _____

_____

_____

_____

Component 3: _____

Description: _____

_____

_____

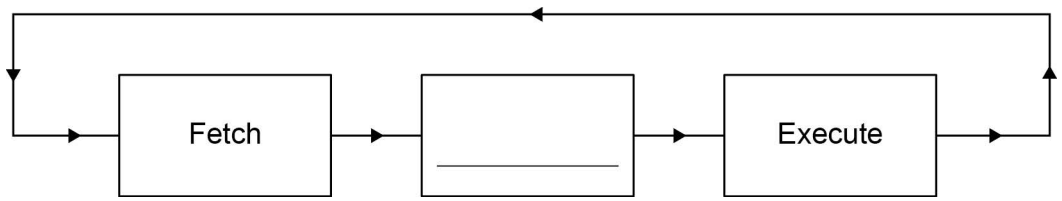
_____

0 8 . 2 **Figure 4** shows a simplified diagram of the Fetch-Execute cycle.

Fill in the name of the missing stage in **Figure 4** below.

[1 mark]

Figure 4



Do not write outside the box

0 9 Computer users will often store their data 'in the cloud'. State **three** reasons why you might want to use cloud storage rather than local storage.

[3 marks]

10

Turn over for the next question

Do not write outside the box

1 0 . 1 Describe **one** difference between system software and application software.

[2 marks]

1 0 . 2 Describe **two** different functions performed by an operating system.

[4 marks]

Function 1:

Function 2:

Do not write outside the box

1 0 . 3 A student was asked to describe what software and hardware are. They gave the following answer:

> 'New hardware can be installed by downloading it from the web or an installation disk whereas software requires someone to physically attach it to the computer.'

Explain **two** mistakes the student has made.

[2 marks]

8

Turn over for the next question

Do not write outside the box

1 1 . 1 Explain **two** differences between a LAN and a WAN.

[4 marks]

Difference 1: _____

_____

_____

_____

Difference 2: _____

_____

_____

_____

1 1 . 2 HTTP and HTTPS are two application layer protocols.

Explain why HTTPS is often used rather than HTTP.

[1 mark]

_____

_____

1 1 . 3 The application layer and the network (internet) layer are two of the layers within the TCP/IP stack.

What are the names of the other **two** TCP/IP stack layers?

[2 marks]

1 _____

_____

2 _____

_____

Do not write outside the box

1 1 . 4 What is the purpose of the network (internet) layer within the TCP/IP stack?

[2 marks]

1 1 . 5 Explain how MAC address filtering works.

[2 marks]

11

Turn over for the next question

Do not write outside the box

1 2 Social engineering is where someone is tricked or manipulated into providing secure information or access to a secure system. Describe each of the following social engineering techniques.

[3 marks]

Blagging: _____

Phishing: _____

Shouldering (or shoulder surfing): _____

3

Do not write outside the box

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

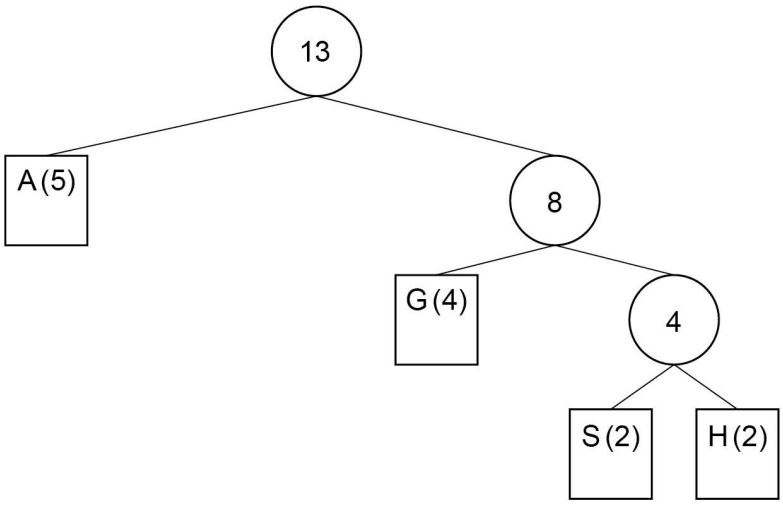
Do not write outside the box

1 3 The Huffman tree shown in **Figure 6** was created to encode the string shown in **Figure 5**. The frequency of each character is shown in brackets. For example, the letter A appears five times within the string shown in **Figure 5**.

Figure 5

AAGHHGGSAAASG

Figure 6



1 3 . 1 Complete the code table below for characters G, S and H for the Huffman tree shown in **Figure 6**. The code for character A has already been completed.

[3 marks]

Character	Binary code
A	0
G	
S	
H	

Do not write outside the box

1 3 . 2 The string shown in **Figure 5** could also be encoded using ASCII. ASCII uses 7 bits to represent each character.

How many bits are **saved** by using Huffman coding rather than ASCII to represent the string shown in **Figure 5**?

You **must** show your working.

[4 marks]

Answer: _____

7

Turn over for the next question

Do not write outside the box

1 4 Many organisations provide free public access to a wireless network.

Explain **three** ethical, legal or data privacy issues that an organisation should be aware of when allowing this access.

[6 marks]

6

Do not write outside the box

1 5 AQATravel is a tour operator that sells holidays to places all around the world. They hold all of their customer and business data electronically. Following recent news articles about the effects of malware attacks on businesses, the management of AQATravel have been investigating how they could protect themselves against malware attacks.

Discuss four methods that AQATravel could use to prevent infections from malware and/or to minimise the damage that could be caused by malware.

[12 marks]

Do not write outside the box

12

END OF QUESTIONS