

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.

### 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. 

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



Answer **all** questions.

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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]

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0 1 . 2

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

You should show your working.

[2 marks]

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Answer: \_\_\_\_\_

0 2

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

$$\begin{array}{r}
 01110101 \\
 00100100 \\
 + 00010001 \\
 \hline
 \end{array}$$


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[2 marks]



0 3

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

[3 marks]

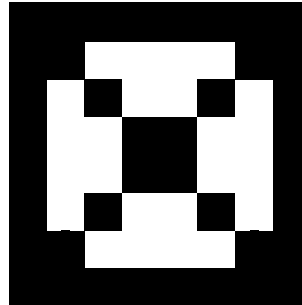
Capacity	Order (1–4)
0.5 Terabytes	
3500 Kilobytes	
2.5 Gigabytes	
6250 Megabytes	

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]

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11

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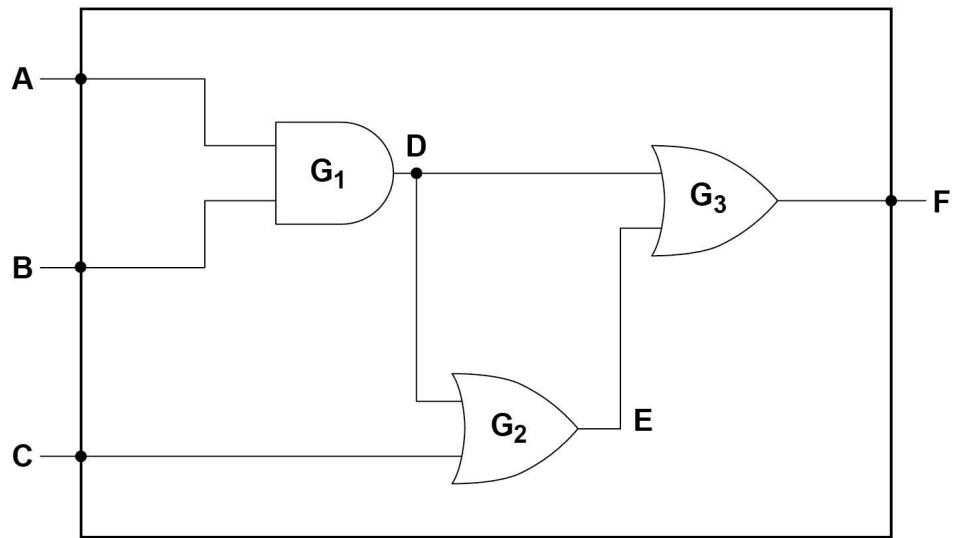
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0 7

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]

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07.4

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

[3 marks]

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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

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0 8 . 1

State **three** components of the CPU and describe their purpose.**[6 marks]**

Component 1: \_\_\_\_\_

Description: \_\_\_\_\_

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Component 2: \_\_\_\_\_

Description: \_\_\_\_\_

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Component 3: \_\_\_\_\_

Description: \_\_\_\_\_

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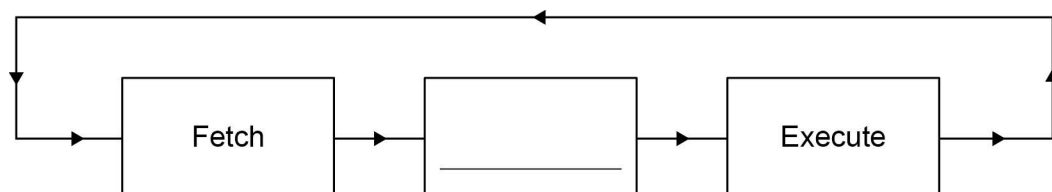


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0 8 . 2

**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**



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]**

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1 0 . 1

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

[2 marks]

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1 0 . 2

Describe **two** different functions performed by an operating system.

[4 marks]

**Function 1:** \_\_\_\_\_

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**Function 2:** \_\_\_\_\_

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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]**

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8

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

**[4 marks]**

**Difference 1:** \_\_\_\_\_

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**Difference 2:** \_\_\_\_\_

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

Explain why HTTPS is often used rather than HTTP.

**[1 mark]**

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**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** \_\_\_\_\_

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**2** \_\_\_\_\_

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1 1 . 4

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

[2 marks]

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1 1 . 5

Explain how MAC address filtering works.

[2 marks]

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11

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1	2
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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



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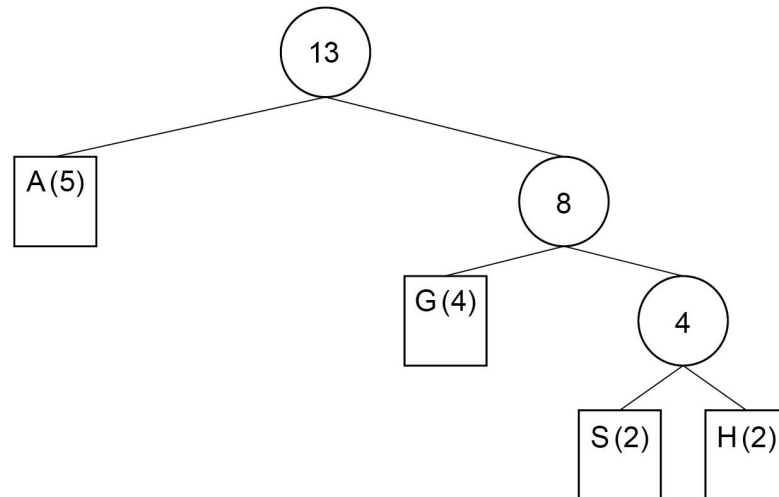


1 3

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	





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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]

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Answer: \_\_\_\_\_

7

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