



Surname _____

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Centre Number _____

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Candidate Signature _____

GCSE

COMPUTER SCIENCE

Paper 2 Written assessment

8520/2

Thursday 17 May 2018 Afternoon

Time allowed: 1 hour 30 minutes

There are no additional materials required for this paper.

At the top of the page, write your surname and other names, your centre number, your candidate number and add your signature.

[Turn over]



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.

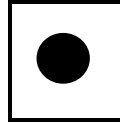
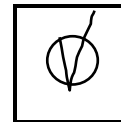
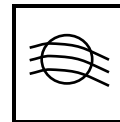
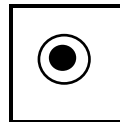
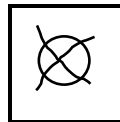
INFORMATION

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

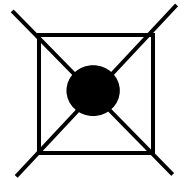


ADVICE

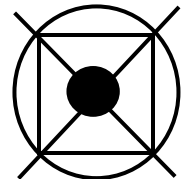
For the multiple-choice questions, completely fill in the lozenge alongside the appropriate answer.

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.

**DO NOT TURN OVER UNTIL TOLD TO DO SO**

Answer ALL questions.

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:
[2 marks]**

```

01110101
00100100
+00010001
—————

```

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	

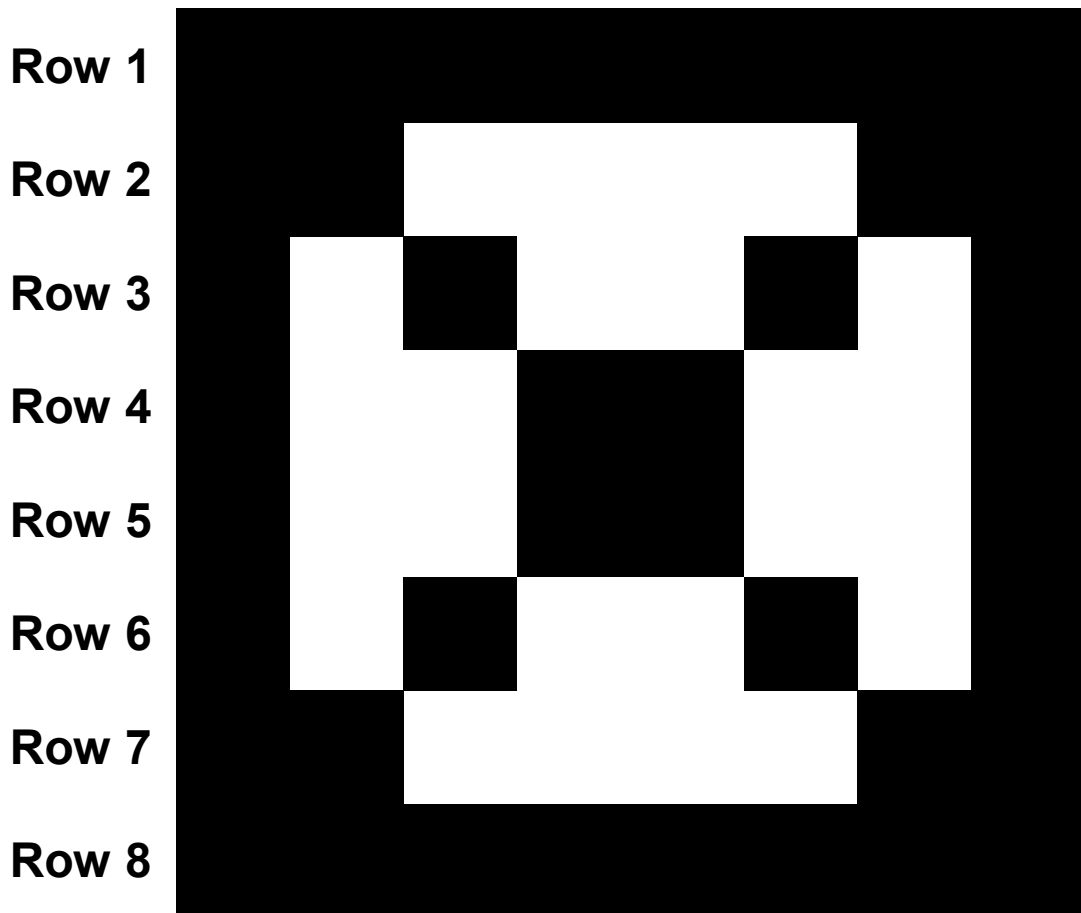
[Turn over]



04

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



04.1

What is the binary representation of Row 4 in FIGURE 2? [1 mark]

Row 4: _____



04.2 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]



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

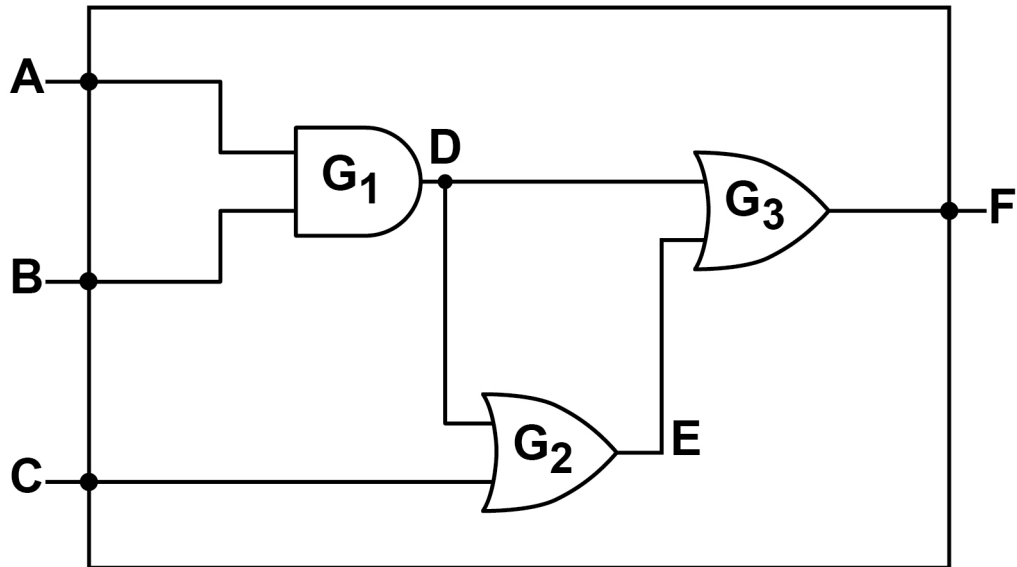
D ROM is non-volatile

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]



07**FIGURE 3 shows a logic circuit.****FIGURE 3****07.1****State the type of logic gate labelled G₁ in FIGURE 3. [1 mark]****G₁:**

07.2**State the type of logic gate labelled G₂ in FIGURE 3. [1 mark]****G₂:**



07.3 State what a NOT gate does. [1 mark]

07.4 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]



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

Component 1: _____

Description: _____

Component 2: _____

Description: _____



Component 3: _____

Description: _____

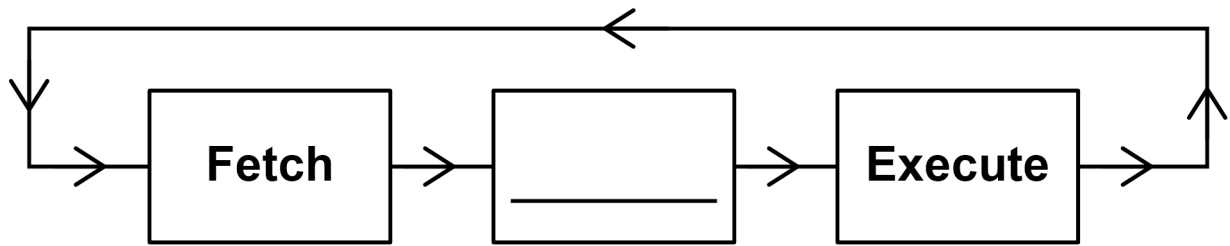
[Turn over]



08.2 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



09

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]



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: _____

1 1 . 1 Explain TWO differences between a LAN and a WAN. [4 marks]

Difference 1: _____

Difference 2: _____

[Turn over]



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 _____



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]



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

[Turn over]



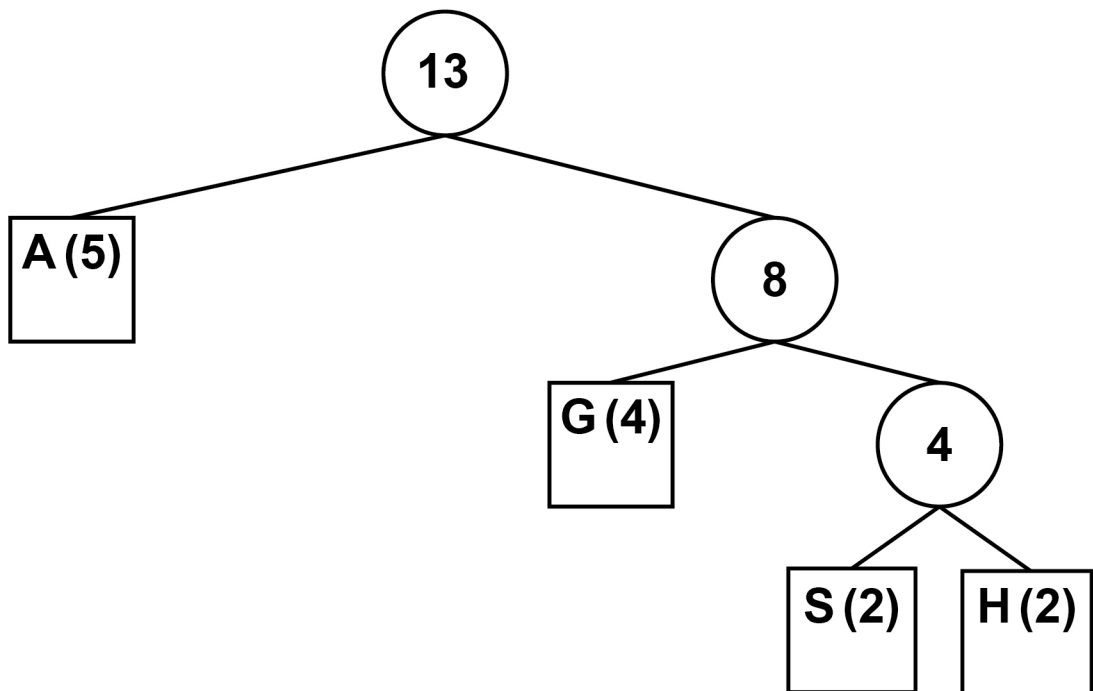
1 3

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



- 13.1** 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	

[Turn over]



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13.2 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]



There are no questions printed on this page

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

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