

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

Advice

or the multiple-choice que	stions, completely	fill in the lozenge	e alongside the	appropriate answer

CORRECT METHOD lacktriangle WRONG METHODS lacktriangle lacktriangle lacktriangle

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.
0 1	A bit pattern is shown in Figure 1 . Figure 1
	10011100
01.1	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



Do not write outside the box [3 marks] [1 mark] [2 marks]

0 3

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

Ca	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 .

What is the binary representation of Row 4 in Figure 2?

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?

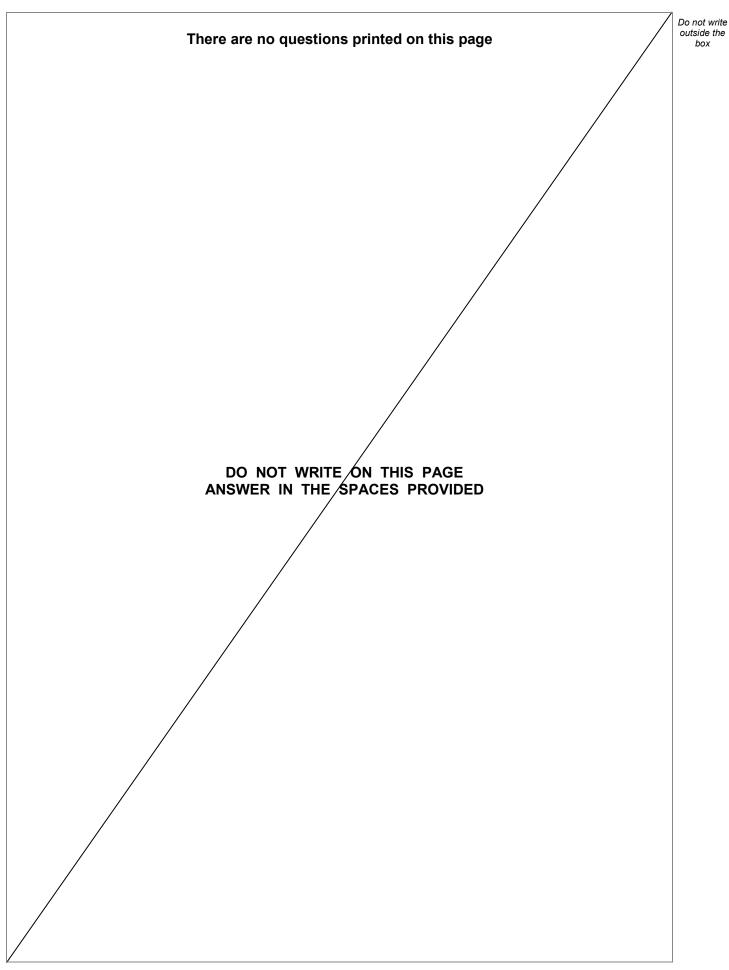
You should show your working.

| 11



0 5	ROM is a type of memory used in computers.		Do not write outside the box
	Shade two lozenges to show which statements are true about ROM.	[2 marks]	
	A Desktop computers usually store application software in ROM	0	
	B Desktop computers typically have more ROM than RAM	0	
	C ROM is commonly used to store start-up instructions	0	
	D ROM is non-volatile	0	
	E ROM is used to increase the quality of graphics on a computer	0	
0 6	Explain how a magnetic hard disk drive (HDD) operates.	[4 marks]	
			6



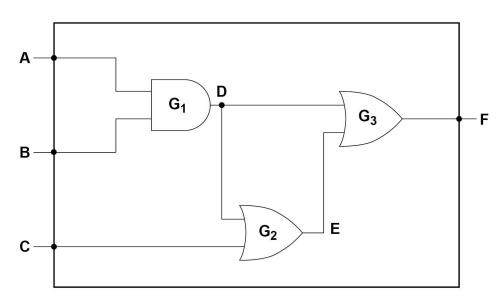






U 1 3 3	0	7	Figure 3 shows a logic	circuit
--	---	---	------------------------	---------

Figure 3



0 7 . 1	State the type of logic gate labelled \mathbf{G}_1 in Figure 3 .	F4
		[1 mark]

0 7.2 State the type of logic gate labelled G₂ in Figure 3.

[1 mark]

G₂:

0 7 . 3	State what a NOT gate does.		
		11]	mark]



0 7.4

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

Do not write outside the box

[3 marks]

Α	В	С	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



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	[i iliai kj
	Figure 4	
	•	
	Fetch	
	- LACCULE	



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]	Do not write outside the box
		10
	Turn over for the next question	





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.	
	Function 1:	[4 marks]
	Function 2:	



1 0 . 3	A student was asked to describe what software and hardware are. They gave the following answer:	Do not w outside t box
	'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
		i .

Turn over for the next question



1 1.1	Explain two differences between a LAN and a WAN. [4 marks]	Do not write outside the box
	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]	
	2	

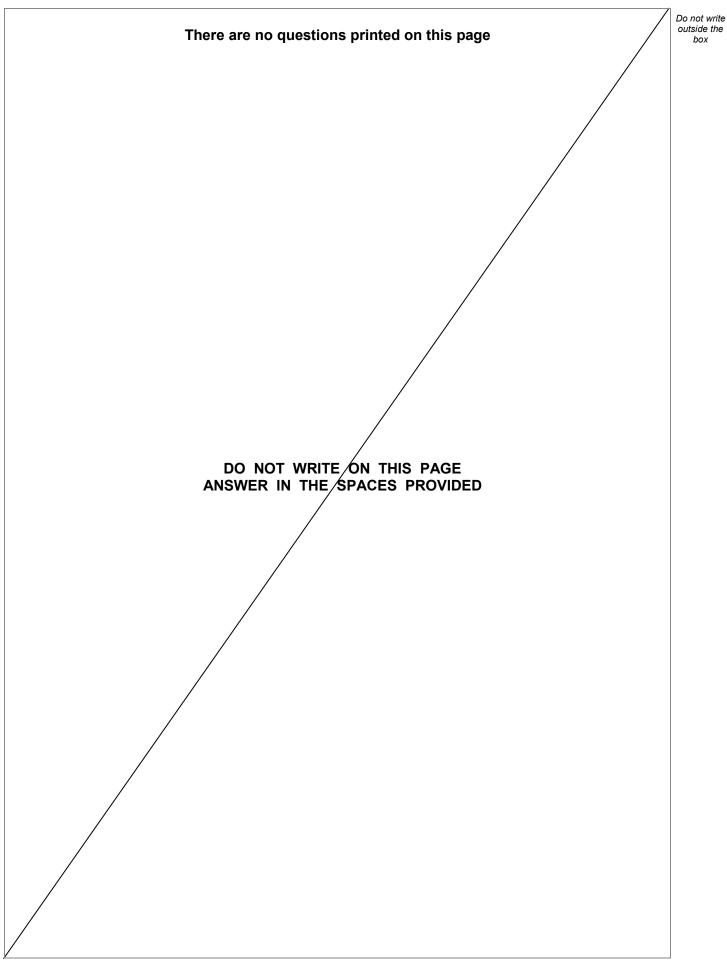


11.4	What is the purpose of the network (internet) layer within the TCP/IP stack?	[2 marks]	Do not write outside the box
1 1.5	Explain how MAC address filtering works.	[2 marks]	
	Turn ever for the port question		11
	Turn over for the next question		



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.	Do not write outside the box
	[3 marks]	
	Blagging:	
	Phishing:	
	Shouldering (or shoulder surfing):	
		3







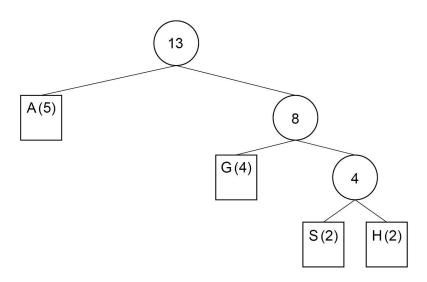
1 3

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 \mathbb{A} appears five times within the string shown in **Figure 5**.

Figure 5

AAGHHGGSAAASG

Figure 6



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
А	0
G	
S	
Н	



		_
1 3.2	The string shown in Figure 5 could also be encoded using ASCII. ASCII uses 7 bits to represent each character.	Do not wr outside th box
	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	



1 4	Many organisations provide free public access to a wireless network.	Do not write outside the box
	Explain three ethical, legal or data privacy issues that an organisation should be aware of when allowing this access.	
	[6 marks]	
		6



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.	Do not write outside the box
	[12 marks]	





	Do not write outside the
	box
	12

END OF QUESTIONS

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