Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

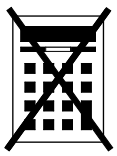
Candidate signature _____

GCSE
COMPUTER SCIENCE

Paper 2 Written Assessment

Thursday 16 May 2019 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	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–16	
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 in the spaces provided.

Do not write outside the box

0 1 . 1 Convert the decimal number 197 into binary.

[1 mark]

0 1 . 2 Convert the hexadecimal number A4 into decimal.

Show your working.

[2 marks]

Answer _____

0 2 . 1 What is the largest decimal number that can be represented using 5 bits?

[1 mark]

0 2 . 2 How many bits are there in 3 MB?

Show your working.

[2 marks]

Answer _____

Do not write outside the box

0 3 State **one** advantage of using Unicode instead of using ASCII.

[1 mark]

0 4 Which **two** of the following are components of a CPU?

Shade **two** lozenges.

[2 marks]

A Arithmetic logic unit ⬭

B Control unit ⬭

C Fan ⬭

D Hard disk drive ⬭

E Keyboard ⬭

F Power supply unit ⬭

0 5 A computer game is one type of application software. State **two** other types of application software. You must **not** use brand names in your answer.

[2 marks]

1 _____

2 _____

Turn over for the next question

11

Do not write outside the box

0 6 Select the **correct** statement about secondary storage.

Shade **one** lozenge.

[1 mark]

A Secondary storage is a type of ROM. ⬭

B Secondary storage is non-volatile. ⬭

C Secondary storage is temporary. ⬭

D Secondary storage loses its content when it is turned off. ⬭

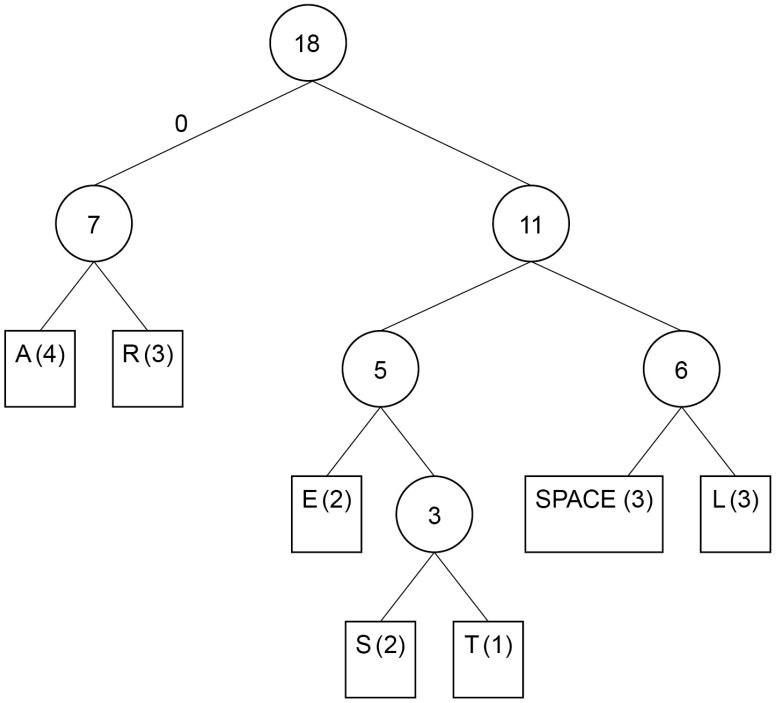
0 7 Describe how an optical disk is read.

[4 marks]

Do not write outside the box

0 8 The Huffman tree in **Figure 1** was generated for the string `ARE ALL STARS REAL`

Figure 1



0 8 . 1 Part of the string `ARE ALL STARS REAL` was incorrectly encoded as in **Figure 2** below.

Figure 2

`1111000010101011`

What string does this encoding represent?

[1 mark]

0 8 . 2 What would be the correct binary encoding for the substring `STAR`?

Write the correct encoding below the letters in the table.

[2 marks]

S	T	A	R

8

Turn over ►

Do not write outside the box

0 9 Explain **two** reasons why software companies usually do **not** make their source code publicly available. Source code is the code they wrote to create the software.

[4 marks]

1 0 Define the term **embedded system**.

[2 marks]

Do not write outside the box

1 1 . 1 Draw a simple diagram to show a star network topology containing four desktop computers.

[2 marks]

1 1 . 2 Draw a simple diagram to show a bus network topology containing four desktop computers.

[2 marks]

Question 11 continues on the next page

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Do not write outside the box

1 1 . 3 State **two** advantages of using a star topology instead of a bus topology.

[2 marks]

1 _____

_____

2 _____

_____

1 1 . 4 State **one** disadvantage of using a star topology instead of a bus topology.

[1 mark]

_____

_____

1 1 . 5 Discuss the benefits and risks of using a computer network.

[9 marks]

_____

_____

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Do not write outside the box

1 1 . 6 Define the term **network protocol**.

[2 marks]

1 1 . 7 Which **two** of the following are email protocols?

Shade **two** lozenges.

[2 marks]

A FTP ⬭

B HTTP ⬭

C IMAP ⬭

D SMTP ⬭

E TCP ⬭

F UDP ⬭

16

Turn over ►

Do not write outside the box

1 2 . 1 Explain why a firewall improves network security.

[2 marks]

1 2 . 2 A company has decided to move its business online but it is concerned about making sure that only authorised users can gain access to the system. The company has set up a CAPTCHA system to check that the user is not a robot.

Explain **three** different electronic methods that could then be used to confirm user identity.

[6 marks]

Do not write outside the box

1 2 . 3 Penetration testing can be conducted as either black-box or white-box testing.

Explain the difference between these two types of penetration testing.

[4 marks]

1 3 The four layers of the TCP/IP network model are shown below.

For each row in **Figure 3**, write the letter **A**, **B**, **C** or **D** that matches the description.

Each letter should only be used once.

[2 marks]

A Application layer
B Transport layer
C Internet layer
D Link layer

Figure 3

Description	Letter
Addresses data for transmission	
Sets up the communication between the two hosts	
Where the network hardware is located	
Where the user software, such as web browsers or email programs, operates	

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Do not write outside the box

1 4 A virus is a specific category of malware.

Describe **three** other different categories of malware.

[6 marks]

Malware 1 _____

Malware 2 _____

Malware 3 _____

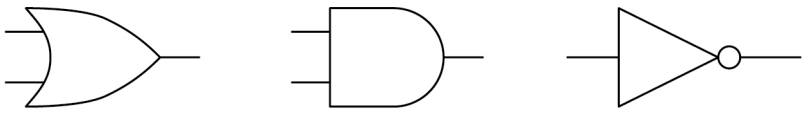
Do not write outside the box

1 5 A burglar alarm sounds an alarm when it is armed (turned on) and the window or door is opened.

The truth table for this basic system is shown in **Figure 4**.

Figure 4

Armed (A) 0 = Off 1= On	Door (B) 0 = Closed 1 = Open	Window (C) 0 = Closed 1 = Open	Alarm (Q) 0 = Off 1 = On
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1



OR AND NOT

Draw the logic circuit that represents the truth table in **Figure 4**. You **must** use the correct symbols for logic gates. You may not need to use all the gates shown.

[3 marks]

9

Turn over ►

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1 6 Specifications for two different devices are shown in **Figure 5**.

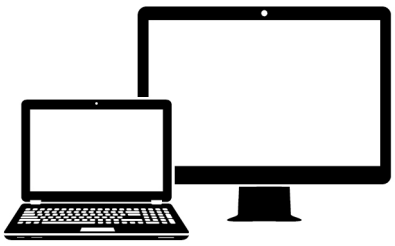
Discuss the advantages and disadvantages of **Device A** compared to **Device B**.

Your answer should explain the impact each advantage/disadvantage will have on the operation of the device.

You should assume that any aspects of the specifications **not** mentioned in **Figure 5** are the same for both devices.

[12 marks]

Figure 5



Device A	Device B
Quad (4) core 1.6 GHz CPU with 8 MB cache	Dual (2) core 3.9 GHz CPU with 2 MB cache
16 GB RAM	4 GB RAM
2 TB Hard Disk Drive (HDD)	250 GB Solid State Drive (SSD)

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END OF QUESTIONS

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