

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

I declare this is my own work.

GCSE COMPUTER SCIENCE

Paper 2 Computing concepts

Tuesday 20 May 2025 Afternoon Time allowed: 1 hour 45 minutes

Materials

- There are no additional materials required for this paper.
- You must **not** use a calculator.



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.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

The total number of marks available for this paper is 90.

For Examiner's Use

Question	Mark
1–2	
3–6	
7–8	
9–10	
11	
12–14	
15–19	
20	
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.



J U N 2 5 8 5 2 5 2 0 1

Answer **all** questions.**0 1 . 1**State the number of **bits** in **one** byte.**[1 mark]**

0 1 . 2State the number of different values that can be represented using **three** bits.**[1 mark]**

0 1 . 3

Which number base is called binary?

Shade **one** lozenge.**[1 mark]****A** Base 2☐**B** Base 8☐**C** Base 10☐**D** Base 16☐

0 2 . 1

Convert the hexadecimal number 3F into **decimal**.

You should show your working.

[2 marks]

0 2 . 2

Add together the following three binary numbers.

Give your answer in **binary**.**[2 marks]**

$$\begin{array}{r}
 0 \ 0 \ 1 \ 0 \ 1 \ 0 \ 0 \ 1 \\
 0 \ 1 \ 0 \ 1 \ 1 \ 0 \ 0 \ 0 \\
 + \ 0 \ 1 \ 0 \ 0 \ 1 \ 1 \ 0 \ 1 \\
 \hline
 \\
 \hline
 \end{array}$$

7
Turn over for the next question**Turn over ►**

0 3Which options show the **two largest** quantities of bytes?Shade **two** lozenges.**[2 marks]****A** 12 000 000 kB☐**B** 800 MB☐**C** 0.001 TB☐**D** 1400 MB☐**E** 24 000 kB☐**F** 1.5 GB☐**0 4**Define the terms **software** and **hardware**.**[2 marks]**

Software _____

Hardware _____

0 5

One function of an operating system is processor management.

State **two other** functions of an operating system.**[2 marks]**

Function 1 _____

Function 2 _____



0 6 . 1

Compilers and assemblers are both types of program translator.

Complete the table below with a tick (✓) for each type of translator for which the statement is **true**.

Put **one** tick (✓) in each row.

[2 marks]

Statement	True for compiler only	True for assembler only	True for both compiler and assembler
Converts program code into machine code			
Translates low-level languages into machine code			
Translates high-level languages into machine code			

0 6 . 2

State **two** differences between assembly language and machine code.

[2 marks]

1 _____

2 _____

10

Turn over for the next question

Turn over ►



0 7 . 1 Which statement describes a character set?

Shade **one** lozenge.

[1 mark]

A A list of characters defining the access rights for a computer network

☐

B A list of characters controlling the execution of a program

☐

C A list of characters mapped to a unique binary code

☐

D A list of characters representing memory locations

☐

Figure 1 shows the binary representation of the string `cab` using ASCII.

Figure 1

1100011 1100001 1100010

0 7 . 2 State the binary value of the ASCII character `b` from **Figure 1**.

[1 mark]

0 7 . 3 State the binary value of the ASCII character `d`

[1 mark]



0 7 . 4 Which **two** statements about ASCII and Unicode are **false**?

Shade **two** lozenges.

[2 marks]

- A** Unicode is an alternative character set to ASCII ☐
- B** Unicode represents a wider range of characters than ASCII ☐
- C** Unicode can represent characters from more languages than ASCII ☐
- D** Unicode uses fewer bits to represent each character than ASCII ☐
- E** All of the ASCII codes are different to the Unicode codes ☐

Turn over for the next question

Turn over ►

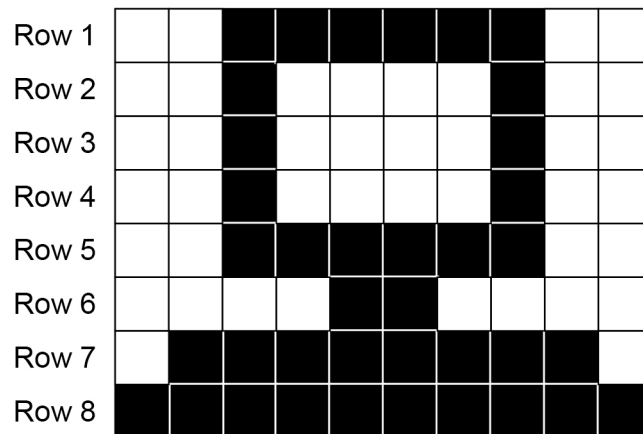


0 8 . 1

Define the term **pixel**.

[1 mark]

Figure 2 shows a bitmap image that uses **two** colours.

Figure 2

0 8 . 2

State the number of pixels in the bitmap image in **Figure 2**.

[1 mark]

0 8 . 3

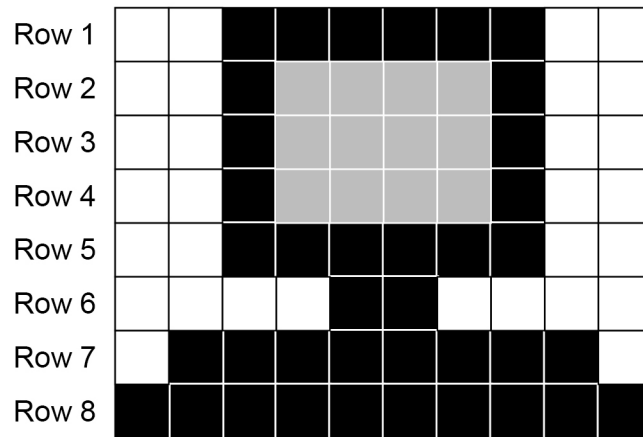
State the minimum colour depth required to represent each pixel in the image in **Figure 2**.

[1 mark]



Figure 3 shows a different bitmap image that uses **three** colours.

Figure 3



0 8 . 4 The binary representation of Row 2 of the image in **Figure 3** is:

00001101010101110000

State the row of the image in **Figure 3** that is represented using:

001111111111111111100

Shade **one** lozenge.

[1 mark]

- A** Row 5 ☐
- B** Row 6 ☐
- C** Row 7 ☐
- D** Row 8 ☐

Question 8 continues on the next page

Turn over ►



0	8	.	5
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A different bitmap image is made up of 1000 pixels and contains four colours.

Calculate the minimum file size of the image in **bits**.

Show your working.

[2 marks]

_____ bits

11



Turn over for the next question

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0 9 . 1

Define the term **sampling rate**.

[1 mark]

0 9 . 2

Define the term **sample resolution**.

[1 mark]

0 9 . 3

Ten seconds of sound has been digitally recorded.

The sampling rate used was 10 000 Hz and the sample resolution used was four bits.

Calculate the minimum file size of the sound file in **kilobytes**.

Show your working.

[3 marks]

kilobytes

1 0 . 1 Figure 4 shows a truth table.

Figure 4

A	Q
0	1
1	0

State the **name** of the logic gate represented using the truth table in **Figure 4**.

[1 mark]

Question 10 continues on the next page

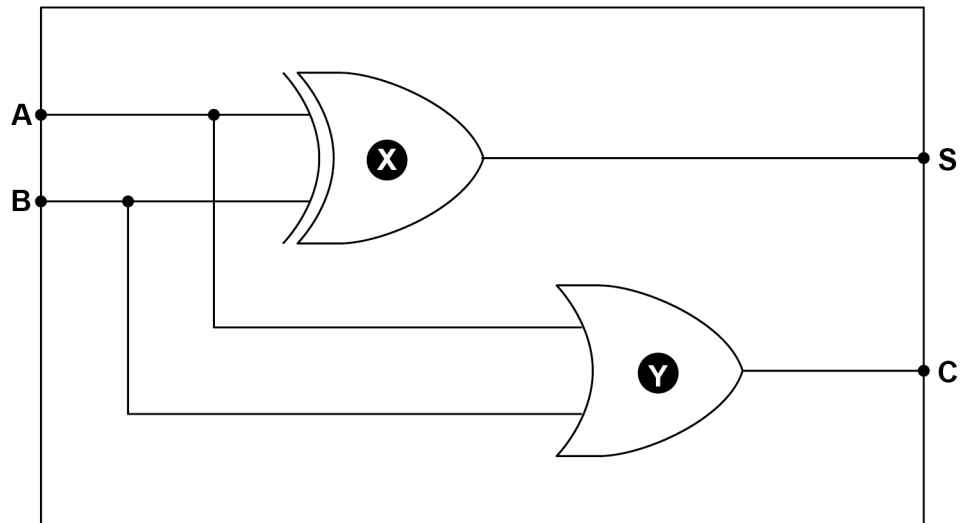
Turn over ►



1 0 . 2

Figure 5 shows a logic circuit that contains an error.

Figure 5

The truth table for the **correct** logic circuit is:

A	B	S	C
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

State the change that must be made to the logic circuit in **Figure 5** for the truth table to be correct.Shade **one** lozenge.

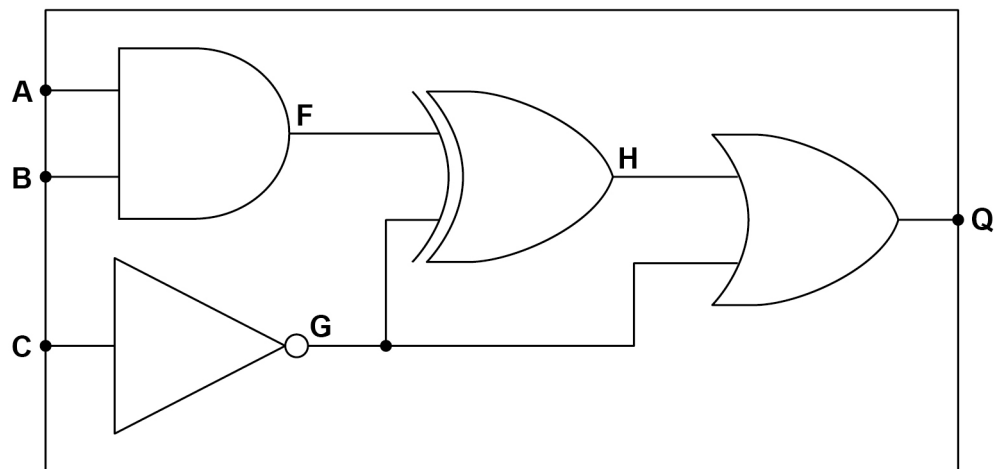
[1 mark]

A Change gate **X** to an AND gate
☐
B Change gate **X** to an OR gate
☐
C Change gate **Y** to an AND gate
☐
D Change gate **Y** to a NOT gate
☐


1 0 . 3

Figure 6 shows a **different** logic circuit.

Figure 6

Complete the truth table for the logic circuit in **Figure 6**.**[4 marks]**

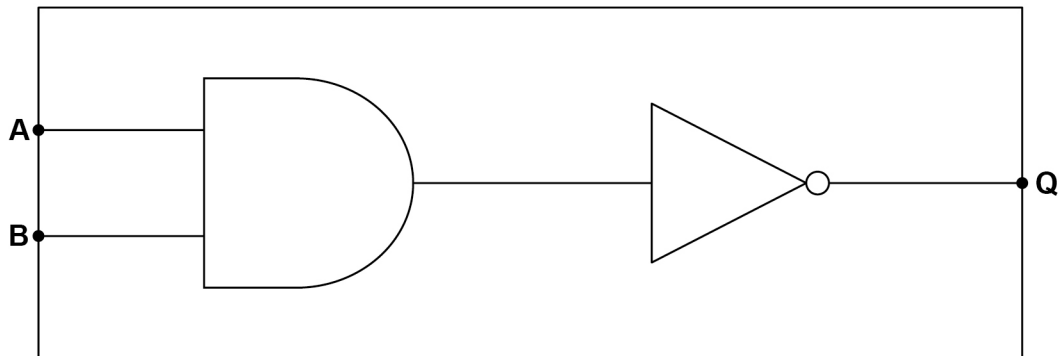
A	B	C	F	G	H	Q
0	0	0	0	1	1	1
0	0	1	0	0	0	0
0	1	0	0	1	1	1
0	1	1	0	0	0	0
1	0	0				
1	0	1				
1	1	0				
1	1	1				

Question 10 continues on the next page

Turn over ►



1 0 . 4

Figure 7 shows a **different** logic circuit.**Figure 7**

Write a Boolean expression that represents the logic circuit shown in **Figure 7**.

You must use the correct symbols for the Boolean operators in your expression.

[2 marks]

Q = _____

13

1 1 . 1

Explain how **main memory** is used during the fetch-execute cycle.**[4 marks]**

1 1 . 2

RAM is a type of main memory.

State **two** differences between RAM and secondary storage.**[2 marks]**

1

2

1 1 . 3

Main memory in desktop computers consists of both ROM and RAM.

Which **two** statements are **true** about main memory in desktop computers?Shade **two** lozenges.**[2 marks]**

- A** Desktop computers generally have more ROM than RAM.
- B** Desktop computers store application software in ROM.
- C** Data can be read from and written to a desktop computer's RAM.
- D** RAM is non-volatile in a desktop computer.
- E** ROM stores start-up instructions for the desktop computer.

☐☐☐☐☐**Turn over ►**

1	2
---	---

Describe **four** advantages of using cloud storage instead of local storage.

[4 marks]

1 _____

2 _____

3 _____

4 _____

1	3
---	---

State **two** differences between embedded systems and non-embedded systems.

[2 marks]

1 _____

2 _____



[9 marks]

[illegible]

15



1 5

One type of penetration testing simulates an attack from a malicious insider.

Describe the **other** type of penetration test.

[2 marks]

1 6 . 1

Describe the **purpose** of FTP (File Transfer Protocol).

[1 mark]

1 6 . 2

Describe the **purpose** of HTTP (Hypertext Transfer Protocol).

[1 mark]

1 7

Phishing is a type of social engineering.

Describe how phishing works.

[2 marks]



1 8 . 1 State **one** biometric security measure that could be used on a mobile phone.

[1 mark]

1 8 . 2 State **one** potential weakness with the biometric security measure you have given in Question **18.1**.

[1 mark]

1 9 . 1 State **three** disadvantages of using a wireless network when compared to a wired network.

[3 marks]

1

2

3

1 9 . 2 State **two** advantages of using fibre-optic cable instead of copper cable in a network.

[2 marks]



2	0	.	1
---	---	---	---

Define the term **relational database**.**[2 marks]**

2	0	.	2
---	---	---	---

Define the term **foreign key**.**[2 marks]**



Question 20 continues on the next page

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A teacher stores data about students and their test scores in a relational database.

The database contains two tables: **Student** and **TestResult**.

Some of the contents of the tables are shown in **Figure 8**.

Figure 8

Student

StudentID	FirstName	LastName	GCSEYear
JT01	John	Tanner	1
DN03	Daniele	Novik	2
RD22	Ruby	Deng	2
TP04	Tracey	Price	1
MC09	Mark	Cooper	1
IR02	India	Rose	1

TestResult

TestResultID	StudentID	Subject	Score
T01	JT01	Computing	32
T02	DN03	Computing	41
T03	MC09	Biology	18
T04	MC09	Computing	42
T05	IR02	Biology	74
T06	JT01	Physics	18
T07	MC09	Biology	26
T08	RD22	Biology	41



[1 mark]

[6 marks]

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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2	0	.	5
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Mark Cooper currently has a score of 18 for one of his Biology tests.

This score has been entered incorrectly. The correct score should be 28

The following SQL is run to make the change:

```
  (A) TestResult  
SET  (B)  
WHERE TestResultID = 'T03'
```

Some parts of the SQL have been replaced by labels.

State the SQL that should have been written in place of the labels (A) and (B).

[2 marks]

(A) _____

(B) _____

13

END OF QUESTIONS



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