



Surname _____

Forename(s) _____

Centre Number _____

Candidate Number _____

Candidate Signature _____

I declare this is my own work.

GCSE

COMPUTER SCIENCE

Paper 2 Computing concepts

8525/2

Tuesday 21 May 2024

Afternoon

Time allowed: 1 hour 45 minutes

At the top of the page, write your surname and forename(s), your centre number, your candidate number and add your signature.

[Turn over]



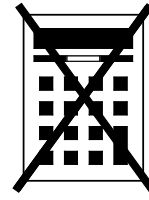
JUN 24 8525201

MATERIALS

For this paper you must have:

- an insert.

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.

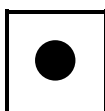
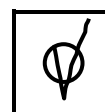
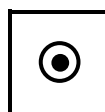
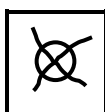
INFORMATION

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

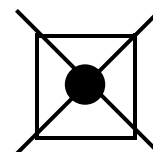


ADVICE

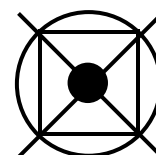
For the multiple-choice questions, completely fill in the lozenge alongside the appropriate answer.

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**

BLANK PAGE



Answer ALL questions.

0 1

Which statement best describes what computers represent using binary?

Shade ONE lozenge. [1 mark]

A All data are represented using binary.

B All data and instructions are represented using binary.

C Some data and instructions are represented using binary.

D Some instructions are represented using binary.

[Turn over]



0 2 . 1

**Convert the binary number 10110111 into decimal.
[1 mark]**

0 2 . 2

Convert the decimal number 112 into hexadecimal.

You should show your working. [2 marks]

Answer _____



0	3
---	---

Add together the following three binary numbers and give your answer in binary. [2 marks]

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

[Turn over]



0	4	.	1
---	---	---	---

FIGURE 1 shows a bit pattern.

FIGURE 1

00110011

State the result of applying a left binary shift of TWO to the bit pattern shown in FIGURE 1. [1 mark]

--	--	--	--	--	--	--	--

0	4	.	2
---	---	---	---

The decimal equivalent of the bit pattern shown in FIGURE 1 is 51

State the result of applying a left binary shift of ONE to the bit pattern shown in FIGURE 1.

Give your answer in DECIMAL. [1 mark]



0	4	.	3
---	---	---	---

Which statement best describes where a single binary shift can be used?

Shade ONE lozenge. [1 mark]

A Multiply or divide numbers by any even number.

B Multiply or divide numbers by any number.

C Multiply or divide numbers by any odd number.

D Multiply or divide numbers by powers of two.

[Turn over]

9



0	5
---	---

FIGURE 2, provided on pages 2 and 3 of the insert, shows four bitmap images.

0	5	.	1
---	---	---	---

State the number of pixels in IMAGE A in FIGURE 2.
[1 mark]

0	5	.	2
---	---	---	---

State the minimum colour depth required to represent IMAGE B in FIGURE 2. [1 mark]



FIGURE 2 is provided on pages 2 and 3 of the insert.

0 5 . 4

FIGURE 3, provided on page 4 of the insert, shows how IMAGE D can be represented as binary data.

Complete the table to show the binary representation of each colour in IMAGE D. [1 mark]

COLOUR	BINARY REPRESENTATION
White	
Black	
Grey	



05.5

The number of colours used in IMAGE C and IMAGE D in FIGURE 2, provided on pages 2 and 3 of the insert, are both increased by one.

State the impact of this increase on the minimum file sizes of both IMAGE C and IMAGE D. [2 marks]

Image C _____

Image D _____

[Turn over]

BLANK PAGE

[Turn over]



07

FIGURE 4, provided on page 5 of the insert, shows a logic gate.

07.1

Which truth table matches the logic gate in FIGURE 4?

Shade ONE lozenge. [1 mark]

A

A	B
0	1
1	0

B

A	B	Q
0	0	0
0	1	0
1	0	0
1	1	1

C

A	B	Q
0	0	0
0	1	1
1	0	1
1	1	1

D

A	B	Q
0	0	0
0	1	1
1	0	1
1	1	0



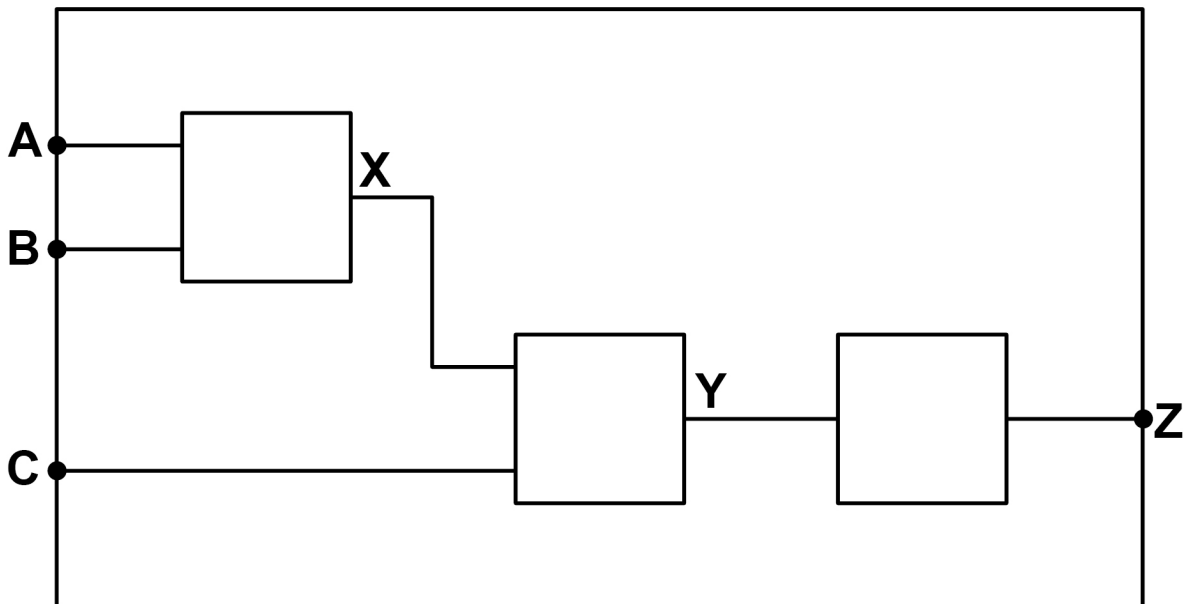
07.2

FIGURE 5, provided on page 6 of the insert, shows a truth table.

Complete the logic circuit by writing the NAME of a logic gate in each empty box.

The completed logic circuit should have the same functionality as the circuit represented by the truth table in FIGURE 5.

You should write the NAME of ONE logic gate only in each box. [3 marks]



[Turn over]



0	7	.	3
---	---	---	---

FIGURE 6, provided on page 7 of the insert, shows a different logic circuit.

Write a Boolean expression that represents the logic circuit shown in FIGURE 6.

You MUST use the correct symbols for the Boolean operators in your expression. [3 marks]

Q = _____



08.1

Three major components of a Central Processing Unit (CPU) are:

- control unit
- clock
- cache.

Describe the function of EACH of the three components. [6 marks]

Control unit _____

[Turn over]

Clock

Cache



0	8	.	2
---	---	---	---

Explain **THREE** ways to improve the performance of a CPU. [3 marks]

1

2

3

[Turn over]

16



BLANK PAGE



0	9	.	1
---	---	---	---

FIGURE 7, provided on page 8 of the insert, contains a Huffman tree.

The Huffman tree in FIGURE 7 was used to encode a string, which resulted in the following bit pattern:

0001011001

**State the string that this bit pattern represents.
[2 marks]**

[Turn over]



09.2

TABLE 1 shows the Huffman codes for the characters used in the string HESELLSSEASHELLASHES

TABLE 1

CHARACTER	CHARACTER FREQUENCY	HUFFMAN CODE
S	6	11
E	5	10
L	4	00
H	3	011
A	2	010
	20	

Calculate how many bits would be saved if the string HESELLSSEASHELLASHES was encoded using the Huffman codes shown in TABLE 1, rather than using ASCII.

You should show your working. [3 marks]



BLANK PAGE



1	0
---	---

Which TWO statements are true about machine code?

Shade TWO lozenges. [2 marks]

A Machine code is directly executed by the processor.

B Machine code is easily understood by humans.

C Machine code is shorter than high-level code.

D Machine code is similar to English.

E Machine code is specific to a family of processors.

F Machine code is translated using a compiler.

[Turn over]



1	1
---	---

Describe THREE differences between high-level programming languages and low-level programming languages. [3 marks]

1 _____

2 _____



3

[Turn over]



11



13.1

Define the term **COMPUTER NETWORK**. [2 marks]

[Turn over]



1 4

SMTP and IMAP are email protocols.

Describe how SMTP and IMAP are used. [2 marks]

SMTP

IMAP

BLANK PAGE

[Turn over]



17

Viruses, trojans and spyware are forms of malware.

Describe how TWO of these forms of malware work.
[4 marks]

Name of malware 1 _____

Description _____

Name of malware 2 _____

Description _____



[Turn over]

12



18.1

Define the term DATABASE. [1 mark]



18.3

Define the term FOREIGN KEY. [2 marks]

A relational database is being developed to store information about actors and the films they have performed in.

The database contains three tables: FILM, PERFORMANCE and ACTOR.

Some of the contents of the tables are shown in FIGURE 8, provided on pages 10 and 11 of the insert.

1 8 . 4

State the identifier of a field from the ACTOR table in FIGURE 8. [1 mark]

[Turn over]



1	8	.	5
---	---	---	---

A list of all the films from the year 2019 in the database is needed.

The following SQL is run to produce the list:

```
A FilmID, Title, Year  
FROM Film  
WHERE B
```

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 _____



FIGURE 8 is provided on pages 10 and 11 of the insert.

18.7

A film called **GLADIATOR** from the year **2000** is to be added to the database with a `FilmID` of **103**

The following SQL is run:

```
INSERT INTO A  
    B    ( C )
```

Some parts of the SQL have been replaced by labels.

State the SQL that should have been written in place of the labels **A**, **B** and **C**. [3 marks]

A

B



©

[Turn over]

14



19.1

Define the term CYBER SECURITY. [2 marks]

BLANK PAGE

For Examiner's Use	
Question	Mark
1–4	
5–6	
7–8	
9	
10–12	
13	
14–17	
18	
19	
TOTAL	

Copyright information

For confidentiality purposes, all acknowledgements of third-party copyright material are published in a separate booklet. This booklet is published after each live examination series and is available for free download from www.aqa.org.uk

Permission to reproduce all copyright material has been applied for. In some cases, efforts to contact copyright-holders may have been unsuccessful and AQA will be happy to rectify any omissions of acknowledgements. If you have any queries please contact the Copyright Team.

Copyright © 2024 AQA and its licensors. All rights reserved.

WP/M/NC/Jun24/8525/2/G4004/V2

