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1875991136

COMPUTER SCIENCE **0478/12**

Paper 1 Theory **May/June 2021**

1 hour 45 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- Calculators must **not** be used in this paper.

INFORMATION

- The total mark for this paper is 75.
- The number of marks for each question or part question is shown in brackets [ ].
- No marks will be awarded for using brand names of software packages or hardware.

This document has **12** pages. Any blank pages are indicated.

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1 A denary value can be converted into hexadecimal and binary.

(a) Complete the table to show the hexadecimal and 8-bit binary values of the given denary values.

Denary	Hexadecimal	8-bit binary
49		
123		
200		

[6]

Working space

.....

.....

.....

.....

.....

(b) Give **two** benefits, to users, of converting binary values to hexadecimal.

Benefit 1 .....

.....

Benefit 2 .....

.....

[2]

(c) Hexadecimal is used to represent Hypertext Markup Language (HTML) colour codes in computer science.

Identify **three** other ways that hexadecimal is used in computer science.

1 .....

2 .....

3 .....

[3]

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2 Data storage can be magnetic, solid state or optical.

(a) **Six** statements are given about data storage.

Tick (✓) to show if the statement applies to magnetic, solid state or optical storage. Some statements may apply to more than one type of storage.

Statement	Magnetic (✓)	Solid state (✓)	Optical (✓)
no moving parts are used to store data			
pits and lands are used to store data			
data is stored on platters			
flash memory is used to store data			
parts are rotated to store data			
data can be stored permanently			

[6]

(b) **(i)** Give **one** example of magnetic storage.

..... [1]

(ii) Give **one** example of optical storage.

..... [1]

(iii) Identify which type of storage would be the most suitable for use in a web server and justify your choice.

Type of storage .....

Justification .....

.....

.....

.....

[3]

(c) Describe the operation of USB flash memory and how it stores data.

.....

.....

.....

.....

.....

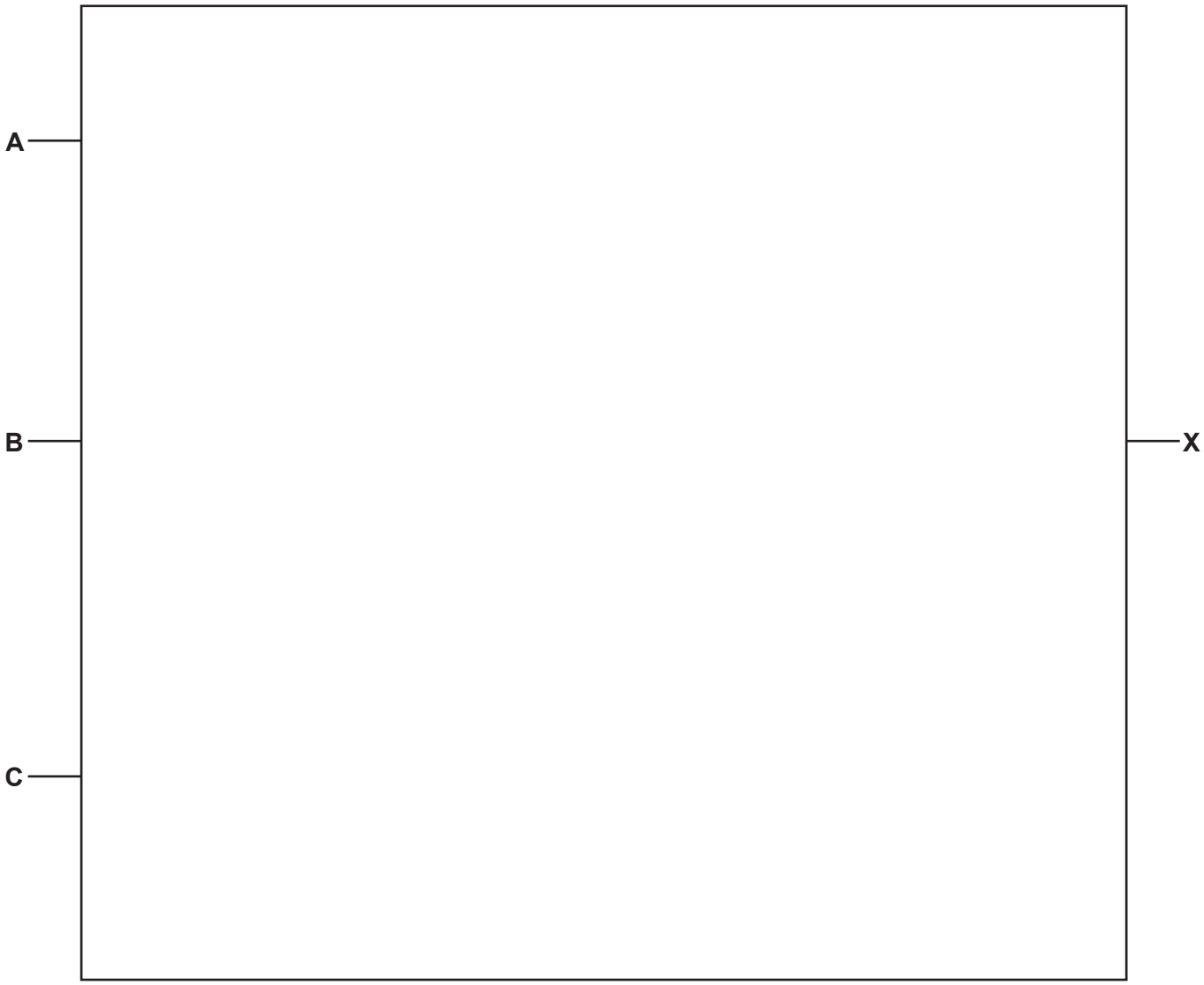
..... [3]

3 Consider the logic statement:

X = ((((NOT **A** AND **B**) OR **C**) AND **B**) NOR (**B** OR **C**))

(a) Draw a logic circuit to represent the given logic statement.

Do **not** attempt to simplify the statement. All logic gates must have a maximum of **two** inputs.



[6]

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(b) Consider the completed truth table for the given logic statement.

Row number	A	B	C	Working space	X
1	0	0	0		**1**
2	0	0	1		**1**
3	0	1	0		**1**
4	0	1	1		**0**
5	1	0	0		**1**
6	1	0	1		**0**
7	1	1	0		**1**
8	1	1	1		**1**

There are four errors in the truth table in the output (X) column.

Identify the **four** incorrect outputs.

Write the row number to identify each incorrect output.

Row .....

Row .....

Row .....

Row .....

[4]

4 Three types of Internet security risk are virus, spyware and denial of service (DoS) attack.

(a) **Six** statements are given about Internet security risks.

Tick (✓) to show whether the statement applies to virus, spyware or denial of service. Some statements may apply to more than one Internet security risk.

Statement	Virus (✓)	Spyware (✓)	Denial of service (✓)
captures all data entered using a keyboard			
can be installed onto a web server			
prevents access to a website			
is malicious code on a computer			
is self-replicating			
damages the files on a user's hard drive			

[6]

(b) Identify **three** other types of Internet security risks.

1 .....

2 .....

3 .....

[3]

(c) Some Internet security risks can maliciously damage data. Data can also be damaged accidentally.

State **three** ways that data could be accidentally damaged.

1 .....

2 .....

3 .....

[3]

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5 A security light system is used by a factory. The light only comes on when it is dark and when movement is detected. The light will stay on for 1 minute before switching off.

Sensors and a microprocessor are used to control the security light system.

(a) Identify **two** sensors that would be used in the security light system.

Sensor 1 .....

Sensor 2 .....
[2]

(b) Describe how the sensors and the microprocessor control the security light system.

.....

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..... [8]

6 Cookies can be used to store a user's personal data and online browsing habits.

(a) A cookie could be used to automatically enter a user's payment details when the user makes a purchase online.

Describe how cookies can be used to store and automatically enter a user's payment details.

.....

.....

.....

.....

.....

..... [3]

(b) Explain why a user may be concerned about their personal data and online browsing habits being stored in cookies.

.....

.....

.....

.....

.....

.....

.....

..... [4]

7 Jolene uses HTML to create a website. She separates the HTML into structure and presentation.

(a) (i) Give **one** example of HTML structure.

..... [1]

(ii) Give **two** examples of HTML presentation.

1 .....

2 .....
[2]

(b) Explain why Jolene separates the HTML into structure and presentation.

.....

.....

.....

..... [2]

8 A keyboard is a type of input device that can be used to enter data into a computer.

Complete the paragraph that describes one method of operation for a keyboard, using the most appropriate terms from the given list. **Not** all terms in the list need to be used.

- Binary
- Breaks
- Calculated
- Character
- Circuit
- Current
- Information
- Network
- Press
- Processor
- Signal
- Switch

A keyboard has a key matrix underneath the keys. When a key is pressed, it presses a

..... that completes a ..... . This allows

..... to flow. The location of the key pressed is

..... . The location of the key pressed is compared to a

..... map to find the ..... value for the key that

has been pressed.

[6]

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