Cambridge Assessment International Education

Cambridge O Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

0622156169

COMPUTER SCIENCE **2210/12**

Paper 1 Theory **May/June 2020**

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. Blank pages are indicated.

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1 A Von Neumann model for a computer system has a central processing unit (CPU) that makes use of registers.

(a) Identify **three** registers that may be used.

Register 1 .....

Register 2 .....

Register 3 .....
[3]

(b) The CPU is responsible for processing instructions.

One stage of processing instructions is the decode stage.

(i) Identify the **two other** stages of processing instructions.

Stage 1 .....

Stage 2 .....
[2]

(ii) Identify the component of the CPU that is responsible for decoding instructions.

..... [1]

2 Both an interpreter and a compiler can be used when writing a program in a high-level language.

(a) Explain why a programmer would make use of both an interpreter **and** a compiler.

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..... [4]

(b) Give **three** reasons why a programmer would choose to write a program in a high-level language, instead of a low-level language.

Reason 1 .....

.....

Reason 2 .....

.....

Reason 3 .....

.....
[3]

3 A company collects and stores data about its customers. The data is stored on a server in the company's office.

The data is transmitted to cloud storage to create a back-up.

The data is encrypted using symmetric encryption before it is sent to the cloud storage.

(a) Describe how the data is encrypted.

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.....

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.....

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..... [4]

(b) Give **three other** methods that can be used to secure the data in the office.

Method 1 .....

.....

Method 2 .....

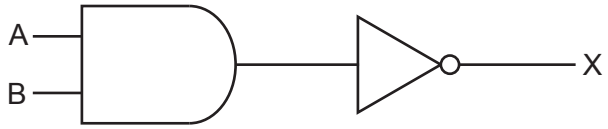
.....

Method 3 .....

.....
[3]

4 **(a)** Identify the name **and** draw the **single** logic gate that can replace the given logic circuits.

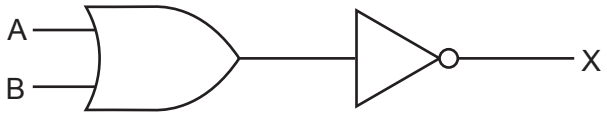
(i)



Name of gate: …… Drawing of gate:

[2]

(ii)



Name of gate: …… Drawing of gate:

[2]

(b) Complete the truth table for the given logic statement:

X = (((**A** OR **C**) AND (NOT **A** AND NOT **C**)) XOR **B**)

A	**B**	**C**	Working space	**X**
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

[4]

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5 Meena uses a browser to research information for her business.

(a) Give **three** functions of a browser.

1 .....

2 .....

3 .....
[3]

(b) Meena buys products for her business using the Internet.

The Transport Layer Security (TLS) protocol is used for transferring data when she buys products.

One layer of the TLS protocol is the handshake layer.

(i) Describe the purpose of the handshake layer.

.....

.....

.....

..... [2]

(ii) Identify the other layer of the TLS protocol.

..... [1]

(iii) Identify another protocol that can be used to transfer data securely.

..... [1]

(c) Meena visits a website to buy products for her business.

The browser uses a small file to store the details of the products she views. This allows the website to display advertisements for other products she may like.

The small file also stores her log-in details.

Give the name of this type of file.

..... [1]

6 **Six** statements are given about touch screen technology.

Tick (✓) to show if the statement applies to **Capacitive** or **Resistive** touch screen technology.

Statement	**Capacitive (✓)**	**Resistive (✓)**
Needs pressure to be applied to create a circuit		
May not register a touch if the user is wearing gloves		
More commonly used in smartphones		
More responsive to a touch		
Needs an electrical field to be changed to register a touch		
Cheaper to manufacture		

[6]

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7 **(a)** Give the **denary** value of each of the three 12-bit binary values.

(i) 000000001100

..... [1]

(ii) 000011000110

..... [1]

(iii) 010011000001

..... [1]

Working space

.....

.....

.....

.....

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.....

.....

(b) 12-bit binary values can also be represented as hexadecimal values.

Give the **hexadecimal** value of the 12-bit binary value.

000011101001

..... [3]

8 Leonard has a new laser printer to print letters for his business.

Leonard connects his printer to his computer using the USB port.

(a) Give **three** benefits of using the USB port to connect the printer to the computer.

Benefit 1 .....

.....

Benefit 2 .....

.....

Benefit 3 .....

.....
[3]

(b) State **two** benefits and **one** drawback of Leonard using a laser printer, instead of an inkjet printer, to print the letters.

Benefit 1 .....

.....

Benefit 2 .....

.....

Drawback .....

.....
[3]

(c) An interrupt signal is sent from the printer to the computer.

(i) Give **two** examples of when a printer would generate an interrupt signal.

Example 1 .....

Example 2 .....
[2]

(ii) Many devices send interrupt signals.

Identify the software in the computer that will receive and manage all interrupt signals.

..... [1]

9 **(a)** **Six** statements are given about storage devices.

Tick (✓) to show if the statement applies to hard disk drive (**HDD**) storage or solid state drive (**SSD**) storage.

Some statements can apply to both.

Statement	**HDD (✓)**	**SSD (✓)**
It has a limited number of read/write cycles		
It uses magnetic properties to store data		
It has moving parts		
It is non-volatile storage		
It can be used as an external storage device to back up data		
It uses flash memory to store data		

[6]

(b) Optical storage is another type of storage.

Give **two** examples of optical storage.

Example 1 .....

Example 2 .....

[2]

10 Uma is concerned about risks that she may encounter when using the Internet.

Two of the risks she is concerned about are phishing and pharming.

(a) Give **one** similarity and **two** differences between phishing and pharming.

Similarity .....

.....

.....

Difference 1 .....

.....

.....

Difference 2 .....

.....

.....
[3]

(b) Identify **two** other risks that Uma could encounter when using the Internet.

Risk 1 .....

Risk 2 .....
[2]

(c) Uma uses a firewall to secure the data on her computer.

(i) Uma tells her friend that a firewall can only be software-based.

Tick (✓) to show whether Uma is **Correct** or **Incorrect**.

☐ **Correct**

☐ **Incorrect**

[1]

(ii) Describe how the firewall helps to keep Uma's data secure.

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..... [4]

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