Cambridge O Level

**Cambridge International Examinations**
Cambridge Ordinary Level

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*6271117683*

**COMPUTER SCIENCE** **2210/13**

Paper 1 Theory **October/November 2018**

**1 hour 45 minutes**

Candidates answer on the Question Paper.

No Additional Materials are required.

No calculators allowed.

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name in the spaces at the top of this page.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
No marks will be awarded for using brand names of software packages or hardware.

Any businesses described in this paper are entirely fictitious.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

The maximum number of marks is 75.

This document consists of **11** printed pages and **1** blank page.

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**1** There are **six** output devices and **six** descriptions shown.

Draw a line to connect each output device to the most appropriate description.

| Device | Description |
|---|---|
| Laser Printer | Uses a high-intensity beam of light shone through three layers of changing pixels |
| LCD Projector | Uses millions of micro mirrors to reflect light through a lens |
| Digital Light Projector (DLP) | Uses plastic, resin or powdered metal to generate a physical output |
| Inkjet Printer | Uses a static electric charge on a rotating drum to generate a physical output |
| 3D Printer | Uses liquid ink to generate a physical output |
| 2D Cutter | Uses a high-power laser to generate a physical output |

[5]

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**2** Parity checks and Automatic Repeat reQuests (ARQ) can be used to check for errors during data transmission and storage.

**(a)** A system uses **even parity**. Write the appropriate parity bit for each byte.

| **Parity Bit** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| | 1 | 0 | 1 | 0 | 0 | 0 | 1 |

[2]

**(b)** Explain how Automatic Repeat reQuests (ARQ) are used in data transmission and storage.

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.....

.....

.....[2]

**(c)** State **one** other method that could be used to check for transmission errors.

.....[1]

**3** An elevator (lift) has a maximum weight limit of 2400 kg. The weight carried is monitored by a sensor and a microprocessor.

Describe how the sensor and the microprocessor are used to make sure the maximum weight limit is not exceeded.

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.....[6]

**4** The MAC address of a device is represented using hexadecimal.

A section of a MAC address is shown. Each pair of hexadecimal digits is stored using 8-bit binary.

**(a)** Complete the table to show the 8-bit binary equivalents for the section of MAC address. The first number has already been converted.

| 6A | FF | 08 | 93 |
|---|---|---|---|
| 01101010 | | | |

[3]

**(b)** Explain why data is stored as binary in computers.

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.....[2]

**5** Data can be transferred using half-duplex serial transmission.

**(a)** Describe serial transmission.

.....

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.....[2]

**(b)** Give **one** application of serial data transmission.

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.....[1]

**(c)** Describe half-duplex data transmission.

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.....[2]

**6** Sarah stores data electronically.

Describe **three** methods that she could use to avoid loss of stored data.

Method 1 .....

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.....

Method 2 .....

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Method 3 .....

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.....

[6]

**7** David is writing a program using a high-level language. The program will be published and sold for profit.

**(a)** David uses an interpreter when creating the computer program.

State **three** features of an interpreter.

Feature 1 .....

.....

Feature 2 .....

.....

Feature 3 .....

.....

[3]

**(b)** David compiles the program when he has completed it.

Explain **two** benefits of compiling the program.

Benefit 1 .....

.....

.....

.....

Benefit 2 .....

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.....

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[4]

**(c)** David needs to send a large section of the programming code as an email attachment.

He uses lossless compression to reduce the file size.

Explain how the file size is reduced.

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.....[3]

**8** Alice enters a URL into a web browser to access a webpage.

**(a)** State what URL represents.

U ..... R ..... L .....[1]

**(b)** Explain how the web browser uses the URL to access the webpage.

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.....[4]

**9** Describe **two** differences between Read Only Memory (ROM) and Random Access Memory (RAM).

Difference 1 .....

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Difference 2 .....

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[4]

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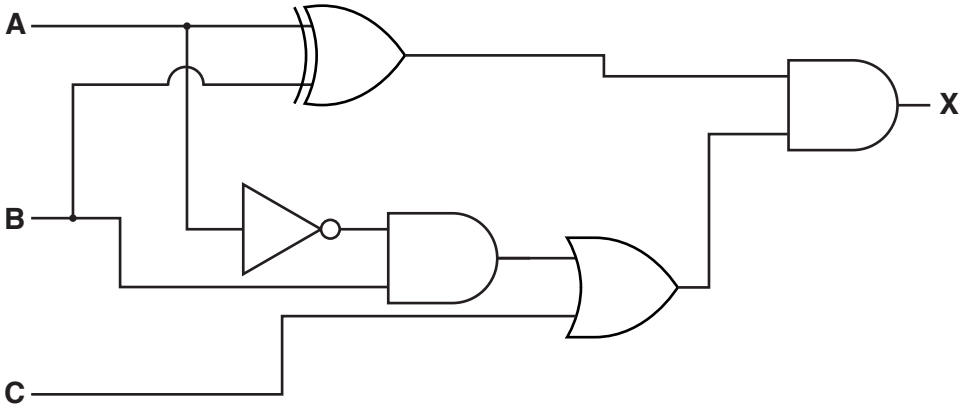
**10** A logic circuit is shown:



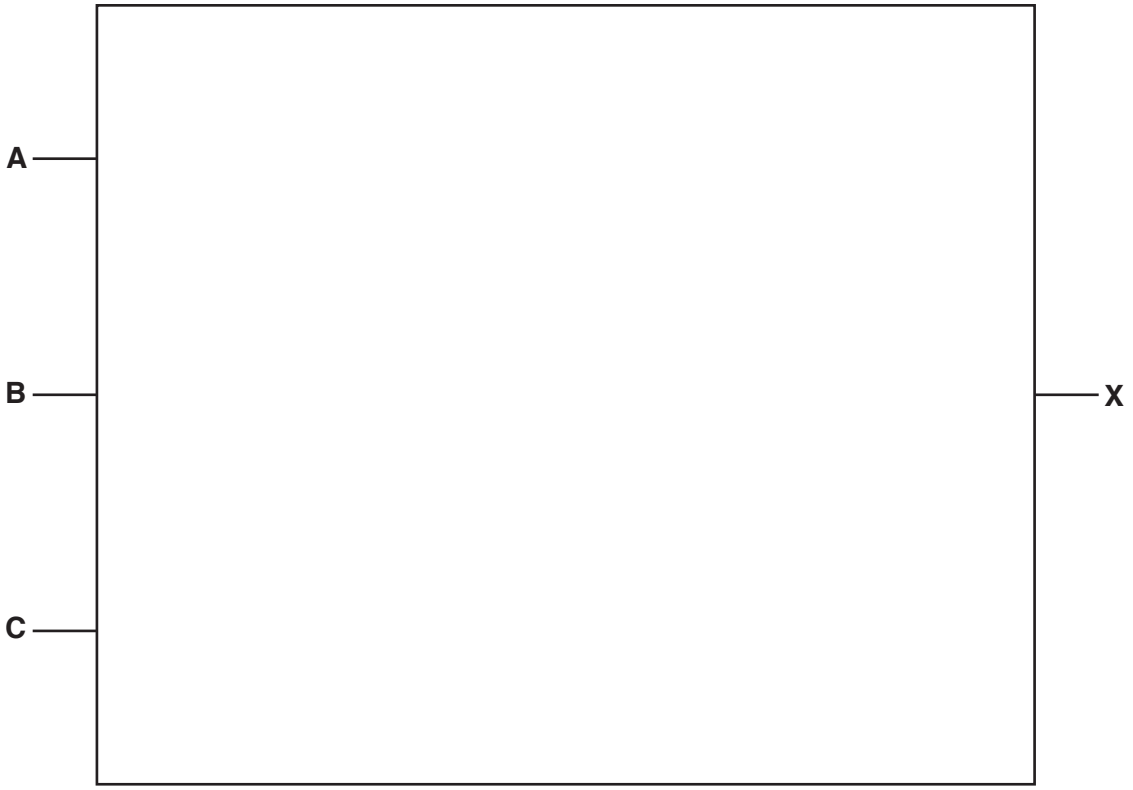

**(a)** Complete the truth table for the given logic circuit.

| 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]

**(b)** Draw a logic circuit corresponding to the logic statement:

X = 1 if ((A is 1 AND B is 1) AND (A is 1 OR C is NOT 1)) OR (B is 1 AND C is NOT 1)




[6]

**11** The fetch-execute cycle make use of registers.

**(a)** Describe the role of the Program Counter (PC).

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.....[2]

**(b)** Describe the role of the Memory Data Register (MDR).

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.....[2]

**12** Explain the difference between a Musical Instrument Digital Interface (MIDI) file and a MP3 file.

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.....[4]

**13** State which types of storage device or media would be most suitable for these scenarios.

For each device or media, justify your choice.

**(a)** Creating a backup of 150 GB of data.

.....

Justification .....

.....
[2]

**(b)** Storing applications on a tablet device.

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Justification .....

.....
[2]

**(c)** Storing a 1200 MB high-definition promotional movie about a new car. The movie is to be given to people who are interested in buying a new car.

.....

Justification .....

.....
[2]

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