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| CANDIDATE NAME: |  |
| CANDIDATE NUMBER: |  |

School Of Coding

**GCSE OCR (9-1) Computer Science**

**Component 1 - Computer Systems &**

**Component 2 - Computational Thinking, Algorithms and Programming**

Mixed Practise Paper

**Time:** 1 hour 30 minutes

**Instructions**

* Use black ink.
* Write your name at the top of this page.
* Answer all questions in the spaces provided.

**Information**

* The marks for each question are shown in brackets.
* The maximum mark for this paper is 80.

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| **FOR EXAMINERS USE ONLY** | | | | | | | |
| Question | **1** | **2** | **3** | **4** | **5** | **6** | **Total** |
| Total Marks | 14 | 9 | 9 | 14 | 18 | 16 | 80 |
| Marks Awarded |  |  |  |  |  |  |  |

1. Karenjit is setting up a network in her home for her family to use. She is unsure as to whether she should use ethernet or wifi to set up the network.
   1. State 2 benefits of using a wired ethernet connection to connect her network rather than Wi-Fi.

[2]

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* 1. State and explain 2 benefits of using Wi-Fi to connect her network rather than a wired ethernet connection.

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* 1. The network that Karenjit has set up is a LAN (Local Area Network).
     1. State two properties of a LAN.

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* + 1. The other type of network that exists is called a WAN (WIde Area Network).

State two properties of a WAN.

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* 1. Karenjit doesn’t want the performance of her network to worsen. She has already identified that the number of devices connected to the network can affect its performance.

Explain two other factors that can affect the performance of her network, also explaining how and why this would affect the performance of Karen’s network.

[6]

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1. Two common CPU components are the Arithmetic Logic Unit and Registers.
   1. Name 1 other component that can be found in the CPU, and explain its purpose.

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* 1. There are 4 main registers in the CPU. Complete the table by entering the full name of the register that matches the description.

[4]

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| **Description** | **Name of Register** |
| This register stores the address of the instruction or piece of data to be stored. |  |
| This register holds data or a program instruction temporarily when it is fetched from memory. |  |
| This register holds the memory address of the next instruction to be processed. |  |
| This register temporarily holds the result of a calculation carried out in the ALU. |  |

* 1. A washing machine has an embedded system.
     1. Define the term “embedded system”.

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* + 1. Give 1 more example of an embedded system.

[1]

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1. One property of ROM (Read Only Memory) is that its contents cannot be edited by the user.
   1. State 2 more properties of ROM.

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* 1. A computer has 8MB of ROM.
     1. How many bytes are in 8MB? Show your working.

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* 1. Ruben is a graphic designer, and stores his projects on a USB stick.
     1. Which type of storage does a USB stick use? Tick ONE box in the table below.

[1]

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| --- | --- |
| **Magnetic** |  |
| **Solid State** |  |
| **Optical** |  |

* + 1. State and explain two advantages of Ruben using this type of storage to store his files.

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1. An operating system is a type of systems software. One function of an operating system is that it provides a user interface for the user to interact with the computer.
   1. Operating systems are also able to carry out memory management and multitasking.

Explain how each of these actions is carried out.

[4]

Memory Management

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Multitasking

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* 1. Another type of systems software is utility software. Data compression software is a type of utility software.
     1. Define the term “compression” and explain why it is needed.

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* + 1. There are two types of compression, lossy and lossless. Explain one difference between lossy compression and lossless compression.

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Explain which type of compression could be used for each type of file and why this type of compression is most appropriate:

* + 1. A pop song to be streamed from the internet.

[3]

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* + 1. A digital book being downloaded onto an e-reader.

[3]

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1. All data on a computer must be represented in binary.
   1. Explain how characters are stored on a computer.

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The ASCII code for the letter A is 65 in denary, or 100 0001 in binary.

* 1. What is the ASCII code for the letter B in binary?

[1]

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* 1. What is the ASCII code for the letter D in binary?

[1]

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* 1. Therefore, how can the word DAB be represented in binary?

[3]

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* 1. Explain which character set would be used in each situation:
     1. Mobile phones that can send messages using emojis.

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* + 1. A text editor that stores an english children's book.

[3]

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* 1. The binary number 01101001 is shifted two places to the right.

What effect will these two binary shifts have on the **value** of the binary number?

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* 1. Write down this number after it has been shifted.

[1]

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* 1. Convert the shifted number into denary.

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1. The following algorithm shows what the function named evenOrOdd does.
2. function evenOrOdd(x)
3. if x % 2 == 0 then
4. return “even”
5. else
6. return “odd”
7. endfunction
   1. Explain the purpose of x in the above function.

[2]

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* 1. Functions and procedures are types of subroutine. Explain one benefit of using subroutines.

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The function evenOrOdd is used in the algorithm below. The algorithm is used in a popular retail store, and is used to check if the clothing items delivered to the store for the day meet the store’s requirements. The store only stocks clothing in even sizes.

1. size = 0
2. noOfItems = 0
3. while size != -1
4. size = int(input(“Enter the size of the clothing item”))
5. result = evenOrOdd(size)
6. if result == “even” then
7. items = items + 1
8. endif
9. size = int(input())
10. endwhile
    1. Complete the trace table to test this program when the user enters the following inputs:

[4]

**8, 11, -1**

|  |  |  |
| --- | --- | --- |
| **size** | **result** | **noOfItems** |
|  |  |  |
|  |  |  |
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* 1. The algorithm has been used for all the clothes that have arrived at the store. It has removed all clothes that do not fit the criteria.

Each item of remaining clothing is labelled with the season it should be displayed for. The seasons are spring, summer, autumn and winter.

Write an algorithm that will:

* Create a 2 dimensional array
* Ask the user for the barcode ID of the item of clothing
* Ask the user what season the item of clothing is labelled with
* The algorithm will add the barcode ID of the item of clothing alongside the season of the item of clothing to the 2 dimensional array
* Repeat this 5 times

[8]

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