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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 2

**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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| Question | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **Total** |
| Total Marks | 12 | 9 | 10 | 7 | 13 | 8 | 10 | 10 | 80 |
| Marks Awarded |  |  |  |  |  |  |  |  |  |

1. Rajiv wants to record his voice to use as a voiceover for a video tutorial he is making.
   1. Explain how Rajiv’s voice is converted into digital form, using sampling, so that it can be stored on his computer.

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* 1. Rajiv records a 5 second audio clip. The audio recording software he’s using has a sample rate of 5KHz and a bit rate of 8 bits. Calculate the file size in kilobytes of the sound he records.

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* 1. Rajiv increases the sample rate for his audio recording software. It now has a sample rate of 50KHz. Explain what effect this would have on the quality and file size of the sound if he were to record it again.

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1. School of Coding has recently been the victim of a Denial of Service attack.
   1. How does a denial of service attack work?

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* 1. State one effect a denial of service attack could have on the School of Coding company.

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* 1. Different types of threats also keep trying to attack School of Coding.

For each of the scenarios listed below, state which method of prevention would be most suitable to stop this threat, and explain your answer:

* + 1. Users of a network accessing suspicious or harmful content.

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* + 1. A virus editing and deleting important files on your personal computer.

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* + 1. Someone using a packet sniffer to intercept data packets being sent and received to your home network.

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1. One piece of hardware needed to connect a stand-alone computer into a LAN is a Wireless Access Point.
   1. State the purpose of a Wireless Access Point.

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* 1. Give the name and explain the purpose of two other pieces of network hardware.

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* 1. Which protocol is responsible for sending data over the internet?

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When using the internet, the Domain Name Server (DNS) is used to access websites

* 1. Explain how using DNS helps us to access websites.

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* 1. Name a benefit of using DNS.

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1. Karenjit has a list of names she needs to sort.
   1. Show the steps needed to perform an insertion sort on the following list:

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| --- | --- | --- | --- | --- | --- |
| Quinn | Doug | Aaron | Carla | Harjit | Fiona |

[6]

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* 1. The other sorting algorithm that Karenjit could use is a merge sort. State one advantage of using an merge sort rather than an insertion sort.

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1. Cameron is making some adjustments to the School of Coding website. He wants to add a general knowledge quiz to the website which gets its data from a text file rather than questions and answers being written in the program.

In the text file, each question is stored on one line, and the answer is on the line underneath.

There are 3 questions and answers in the file. The text file is named “quiz.txt”. These are the items in the text file:

What is the capital city of England?

London

How many hours are in a week?

168

How many legs does an octopus have?

8

* 1. Write a program that:
* Asks the user a question from the text file.
* Checks if the answer is equal to the answer stored in the text file on the next line.
* If it is, a message saying “correct” should be outputted.
* If it isn’t, a message saying “incorrect” should be outputted.
* Repeats this for the other 2 questions and answers in the text file.

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* 1. Cameron has made another activity for the website, which is a maths quiz.

The quiz should generate 2 random numbers to use in a sum, and ask the user for an answer, then output “correct” if the answer is right. It will do this 5 times, resulting in 5 ***different*** questions with ***different random numbers.***

1. rand1 = Random number from 1 to 10
2. rand2 = Random number from 1 to 10
3. total = rand1 + rand2
4. for x = 1 to 5
5. print(“What is”, rand1,”plus”,rand2,”?”)
6. answer = int(input())
7. if answer == total then
8. print(“correct”)
9. endif
10. next x
11. This program contains a logic error.

Define the term “logic error”

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1. Explain how the above program contains a logic error

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1. School of Coding needs to employ receptionists to handle calls and book lessons.

They are considering using an automated virtual receptionist, which uses AI, to carry out these tasks rather than hiring staff.

Discuss the impact of this.

In your answer, you could consider:

* Impacts on School of Coding.
* Impacts on customers.
* Impacts on current employees.
* Ethical, legal and cultural issues.

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1. The following table stores information about School of Coding employees.

The table’s name is “EMPLOYEES”.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| EmployeeNumber | Forename | Surname | LaptopMacAddress | OfficeLocation |
| 00001 | Amy | Smith | FD-14-DB-A5-44-FC | Wolverhampton |
| 00002 | Bob | Gupta | 6E-62-4A-76-F7-BA | Wolverhampton |
| 00003 | Chris | Hemmings | CD-B3-E0-A7-C9-32 | Telford |
| 00004 | Daniel | Lewis | 4B-E0-B4-17-83-E7 | Telford |
| 00005 | Ewan | Sampson | 88-CC-38-6F-97-9A | Wolverhampton |

* 1. Write an SQL statement that would return all data of all employees who are based in the Wolverhampton office.

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* 1. Write the data that would be returned as a result of the following SQL Query:

SELECT EmployeeNumber

FROM EMPLOYEES

WHERE Surname = “S%”

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* 1. The MAC address of the device loaned to each employee is shown in the field LaptopMacAddress.

MAC addresses are represented with hexadecimal numbers.

Name 1 benefit of using hexadecimal over using binary for a MAC address.

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* 1. This is Daniel’s MAC address: 4B-E0-B4-17-83-E7
     1. Convert the following hexadecimal number from his MAC address to denary:

4B

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* + 1. Convert the following hexadecimal number from his MAC address to binary.

E7

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1. Joe wants to write a program, but he isn’t sure whether he should write it using a high level language or a low level language.
   1. Give one example of a high level language.

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* 1. Give one example of a low level language.

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* 1. Joe has decided to write his program using a low level language. Explain one benefit of using a low level language rather than a high level language.

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* 1. Name two drawbacks of Joe using a low level language to write his program.

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* 1. Tick one box in each row to show whether each piece of code is written in a high level language or a low level language.

[5]

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|  | **High Level Language** | **Low Level Language** |
| print(“Hello”) |  |  |
| 00101010 |  |  |
| age = age + 1 |  |  |
| STO 89 |  |  |
| ADD 50 |  |  |