



GCSE COMPUTER SCIENCE

Paper 2 Additional Questions

These questions focus primarily on topics that were not covered by specimen assessment materials which accompany the new GCSE Computer Science specification (8520). It is hoped that teachers will find these additional questions to be a particularly useful resource to enable them to understand the nature of questions for topics not already covered by the specimen assessment materials.

This document contains additional questions; it is not intended to be treated as a complete paper. The questions do not provide balance coverage of the specification or the assessment objectives in the same way that a fully live paper would do.

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Answer **all** questions in the spaces provided.

0 1

Images can be represented in a computer's memory as a bitmap.

0 1

. 1

Explain how an image can be represented as a bitmap.

[3 marks]

0 1

. 2

A bitmapped image with a colour depth of one can represent images that use two colours.

How many **more** colours can be represented in an image if the colour depth is increased from one to four?

[1 mark]

4

0 2

One way of representing sound digitally is to take samples of the original sound.

0 2

. 1

Define sampling rate.

[2 marks]

0 2 . **2** Define sampling resolution.

[2 marks]

0 2 . **3** To calculate the storage requirements that will be needed to store sound samples you need to know both the sampling rate that will be used and the sampling resolution that will be used. Explain how to calculate the storage requirements for the sampled sound data.

[2 marks]

6

0 3 Many computers use the Von Neumann architecture.

0 3 . **1** In a computer that uses the Von Neumann architecture bit patterns can be stored in the main memory. Shade the correct lozenge to indicate what these bit patterns could represent. You should only shade **one** lozenge.

- A** Data
- B** Instructions
- C** Data and instructions
- D** Data or instructions, but not both

[1 mark]

Turn over for the next question

0 3 . **2** Five components of a CPU are given below. For each row in **Table 1**, choose the letter **A, B, C, D** or **E** that best matches the description.

Letters should not be used more than **once**.

- A. Bus
- B. Arithmetic Logic Unit
- C. Control Unit
- D. Clock
- E. Register

Table 1

Description	Letter
Sends a continuous series of electronic pulses	
Decodes the current instruction	
Completes calculations	

[2 marks]

0 4 Barnes Pest Control is a small business with four employees. Each of their employees has a standalone desktop computer. They have decided to use a network instead of standalone machines.

0 4 . **1** Define the term network.

[2 marks]

0 4 .

2

Describe **three** advantages of using a computer network rather than standalone machines.

[3 marks]

0 4 .

3

One disadvantage of using a computer network is that there are increased security risks. Describe **three** other disadvantages of using a computer network.

[3 marks]

0 4 .

4

Two security measures that Barnes Pest Control could use are authentication and encryption. Explain each of these security measures and how Barnes Pest Control could use them.

[4 marks]

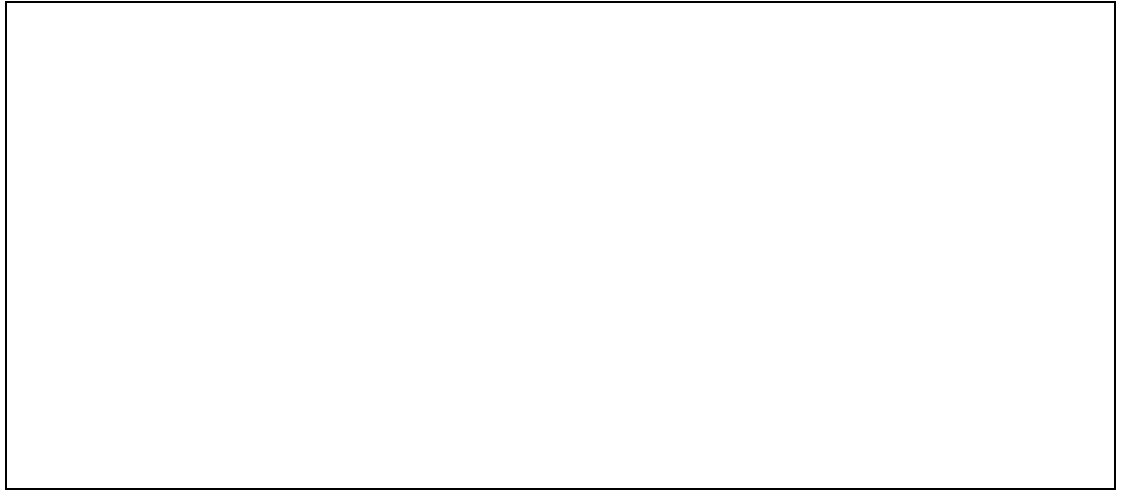
Authentication: _____

Encryption: _____

Turn over for the next question

0 4 . 5 Draw a diagram showing a four-computer network using a bus topology.

[3 marks]



0 4 . 6 Barnes Pest Control decides to use a star network topology. State **two** reasons why this topology may **not** be the most suitable choice.

[2 marks]

0 7

Chess is a two-player board game. Every year there is a competition to find the best chess-playing computer program. In 2011 the chess program Rybka was accused of having copied program code from other chess-playing computer programs and was disqualified from the World Computer Chess Championship. Prize money won in previous years had to be returned.

0 7 . 1

To date, it has never been proven or disproven that Rybka contained copied program code. State **two** reasons why it could be difficult to prove if program code in Rybka had been copied from another program.

[2 marks]

0 7 . 2

The program code that Rybka was accused of copying was open-source, this means that it was publically available so that anyone could look at it. The programmers of Rybka could have tried to prove they were innocent by publishing all their program code. This would allow people to compare it to the code they were accused of copying and see that it was different.

Assuming that there was not any copied program code in Rybka, state **one** reason why the programmers might not want to do this.

[1 mark]

0 7 . 3

Some people believe that copying program code without permission should **not** be a crime. State **one** reason why they might believe this and state **one** reason why some people would disagree with them.

[2 marks]

END OF QUESTIONS

5