AQA

GCSE

Computer Science

Paper 2

Report on the Examination

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General comments
This was the first series of examinations for the reformed GCSE Computer Science. It was pleasing to see that students were able to access the whole range of marks and that, overall, students were well prepared for the examination. Students appeared to have a good grasp of the fundamental knowledge of the aspects of Computer Science required and were able to show and apply that knowledge in their responses.

There were some notable weaknesses, however. In many cases students were let down by an inability to do simple addition, subtraction or multiplication. This was evident in questions 1, 4 and 13.

Exam technique
Students should be reminded to read the question and follow the instructions given. This was not always the case, particularly so in question 3.

Where students showed their working for questions requiring calculations, they were able to gain marks even if the final answer was incorrect. Those who derived an incorrect final answer without showing how the answer had been arrived at were not able to do so.

Question 1
This question was about conversion between number bases.

Most students were able to carry out these conversions. Some students did not accurately convert the right-hand quad of binary digits into the hex digit C. This was often because they appeared to assume that the rightmost binary digit had the value zero instead of one.

Question 2
This question was about binary arithmetic.

Students used a number of ways to carry out this calculation, including converting the numbers to denary and converting back after addition. Any method was allowed, and marks were awarded if the calculation was correct. Where only one quartet of the answer was correct, one mark was awarded.

Question 3
This question was about relative sizes of units of information.

More than half of students were able to put the capacities given into the correct order. A common method was to convert all capacities into kilobytes. A large number of students did not follow the instruction to write the numbers 1 to 4 into the answer spaces. Instead they used a variety of ways to express their answers. In this instance marks were awarded where it was clear what the student intended. In future, however, it is important that students fully follow the instructions within the question.

Question 4
This question was about bit patterns and representing images.

Over three-quarters of students were able to give a correct bit pattern for the first part of the question. Even though the question gave the pattern for Row 3 of the image, a common error was to switch the 1s and 0s when giving the answer.

Students appeared to find the second part of the question more difficult, with less than half gaining any marks. Students who showed how they did the calculation but arrived at an incorrect answer were still able to gain one mark for any correct part of the calculation. Many of these gave an answer of '4 bits' but this was not sufficient to show that 4 bits per pixel were needed, so no marks were awarded if this was the only working shown.

Question 5
This question was about Read Only Memory (ROM).

Whilst most students answered correctly, the two most common incorrect answers were A and B.

Question 6
This question was about Hard Disk Drives.

There were many possible ways of achieving full marks. As this question was similar to some previous questions it was surprising that nearly a tenth of students did not attempt to answer this question at all and fewer than half of students gained two or more marks. Common incorrect responses included descriptions of optical discs, vinyl records, and scattered iron filings.

Question 7
This question was about logic gates, logic circuits and truth tables.

The vast majority of students were able to correctly identify the two logic gates, with most being able to correctly state what a NOT logic gate does. Almost three-quarters of students were able to correctly complete the truth table and those who had incorrectly completed columns D or E were awarded a mark if they had correctly followed the logic through to complete column F.

Question 8
This question was about the components of a CPU.

Many students correctly identified components of a CPU, though fewer were able to describe their purpose. Common incorrect answers were clock speed and core. A less frequent answer showed that some students understood the base unit of a desktop computer system to be a CPU. In the second part of the question the vast majority of students recognised that the answer was 'Decode'.

Question 9
This question was about cloud storage.

Whilst cloud storage is clearly familiar to most students, only a minority were able to state the required three reasons for full marks. Often this was because the reasons given were vague – for example, 'has more space', 'takes up less space' or 'costs less'. The most common incorrect answers given were 'takes up no space', 'less likely to corrupt'.

Question 10
This question was about software and hardware.

Only half of students gained marks on the first part of this question. These students described system software as managing the computer and applications and application software being for specific end user tasks. Some students, in attempting to describe application software instead described system software utilities. Other students described system software as being pre-installed and application software as needing to be downloaded. These descriptions gained no

marks. Often students gave vague descriptions such as ‘is needed to start the computer’ or ‘is needed for a specific application’ without giving the additional detail such as ‘when the computer is booting up’ or ‘such as word processing’ that would have gained a mark.

The second part of this question was also not well answered. Nearly a third of students gained no marks. The functions of the operating system that students need to understand are clearly shown in the specification. Although providing a User Interface is not specifically listed as a function, one mark was awarded if this was given as an answer.

The majority of students were able to gain full marks on the third part of the question. Some, however, just gained one mark for stating ‘they got the descriptions the wrong way around’. Other students provided analysis of grammatical errors or said the student had not answered the question correctly. Neither of these two examples were awarded marks.

Question 11
This question was about networks, network protocols, network models and network security.

Although most students could give one or two differences between LANs and WANs, most could not describe the differences. A common answer was that LANs are smaller and WANs are larger. Without giving a geographical context, or example, this could not be awarded marks. Better students compared speed of transmission across the network or referred to typical ownership of LANs and WANs. Another common incorrect answer was that WANs are wireless (maybe mistaking them for WLANs), whereas LANs are wired.

More than ten percent of students did not attempt to answer either question about TCP/IP stack layers. Of those who answered the second question about the network layer, less than half could describe its purpose. Many students answered that its purpose was to access the internet.
An even higher percentage of students did not attempt to answer the last part of the question about MAC address filtering. A large proportion of those who did answer knew that a MAC address is unique but could not explain how it was used as a device filter.

Question 12
This question was about social engineering techniques.

Generally, this question was answered well, with many students giving clear descriptions of the techniques. Those who were not awarded marks often did not give sufficient detail about the technique. The most commonly misrepresented was phishing, with many students talking about fake emails or SMS coming from supposedly trusted organisations but then not saying that it was done to elicit a response or to gather private information.

Question 13
This question was about Huffman coding.

The first part of the question was answered very well. The second part was answered less well but most students were able to gain marks. Students who did not give a correct answer were able to gain marks for their calculation, even if only parts of it were correct. Many students had carried out most or all of the steps of the calculation but had not performed the arithmetic required correctly. This meant they were unable to gain the full marks.

Question 14
This question was about ethical, legal and data privacy issues.

Understanding the context of the question was important in gaining full marks. The issues required were those that an organisation should be aware of when providing free public Wi-Fi. This was ignored by a large number of students who wrote about issues that users of the free Wi-Fi should be aware of. In most cases this restricted the marks that were awarded to those responses.

Weaker responses tended to refer only to hacking, whilst stronger students were able to explain the possible consequences to the organisation of inadvertently, or otherwise, contravening requirements of relevant legislation. Responses about the digital divide or the social implications of increased use of electronic devices did not attract any marks.

Question 15
This question was about malware, cyber security threats and methods of prevention.

This question was generally well answered, with nearly half of students gaining 6 or more marks. Some excellent answers were seen where methods to prevent malware infection were discussed, explaining how the method worked, why it should be used and giving examples of how the technique could be effective against particular threats. The best students also discussed situations where the technique might not be effective.

Weaker students often ignored the context of the question (a tour operator). Their responses often included such methods as: keeping all records on paper; disconnecting all computers except one from the network; holding customer data on separate systems from their holiday offers etc. Although these students sometimes recognised that these were not reasonable measures, the responses could not be considered creditworthy.

Some other students responded to this question as though it was just about hacking and did not focus on malware infection. Similarly to those who ignored the context, these responses tended to attract a lower range of marks.

A very popular answer was penetration testing, with some students going into great detail about white and black varieties and what they involved. Often, however, they did not then explain that this might be one way of finding where vulnerabilities were in order to plug the holes and make the system more secure. In those cases, the responses were not considered creditworthy.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.

Converting Marks into UMS marks

Convert raw marks into Uniform Mark Scale (UMS) marks by using the link below.

UMS conversion calculator