



AS

Computer Science

7516/2

Report on the examination

Version: 1.0
June 2025

Further copies of this report are available from aqa.org.uk

AQA retains the copyright on all its publications. However, registered centres for AQA are permitted to copy material from this booklet for their own internal use, with the following important exception: AQA cannot give permission to centres to photocopy any material that is acknowledged to a third party even for internal use within the centre.

Question 1

Question part 1.1 asked about number sets and specifically the set of integers. Students were required to identify the two numbers that were integers from a list. The vast majority of students achieved both marks on this question but a small number only selected one option from the available choices even though the question asked for two.

Question part 1.2 asked for a description of the term ordinal number. To achieve the mark, two concepts were needed. These were that ordinal numbers represent position and also that this position is in an order or was part of a data structure. Two thirds of students achieved the mark. Some students identified that position was important but not that this was relative to any other objects so did not achieve the mark.

Question part 1.3 asked students why real numbers were better suited to measuring than natural numbers. This was generally answered well, but a small number of students just described the idea of a real number without any context (measurement) which did not achieve a mark.

Question 2

Question part 2.1 asked how many different values could be represented by a byte, a concept that was well understood. A common incorrect answer was 255 where the student identified the highest number rather than the total number of values that could be represented.

Question part 2.2 asked for a binary to decimal conversion and almost all students answered correctly. A small number of students treated the bit pattern as using two's complement even though the question identified it as unsigned.

Question part 2.3 asked students to add two 8-bit binary numbers, showing working. It was pleasing to see that almost all students achieved the correct answer and showed the correct carry bits for the second mark.

Question part 2.4 asked for the highest and lowest values that could be represented by a two's complement binary integer in four bits. This was one of the most challenging parts of question 2 but whilst a fifth of students did not achieve any marks, two thirds achieved both.

Question part 2.5 asked students to show the completion of a binary subtraction. This was similar to a previous question and was better answered this year, with the vast majority of students achieving all three marks. Most students who achieved zero marks were those who showed no valid working and so had probably calculated the subtraction in decimal and then just represented this in binary, which was not given any credit.

This final question part asked students to represent 5.75 as a fixed-point binary number. The vast majority of students achieved both marks, with a small number incorrectly treating this as a two's complement number rather than the unsigned number specified in the question.

Question 3

Question part 3.1 asked students to state the binary representation of an ASCII character given the binary representation of a different ASCII character. This required students to know that the ASCII values for letters are consecutive and as a result that they had to add three onto the binary representation of the ASCII character Q which was given. The vast majority of students did this successfully.

Question part 3.2 was a slight variation on previously asked questions about the well understood differences between ASCII and Unicode. This question asking for one limitation of ASCII that is overcome by using Unicode. More than two thirds of students achieved this mark. Those who did not often just stated something about Unicode when the question asked for the limitation of ASCII.

Question 4

Question four was about sound representation.

Question part 4.1 asked what a sample represents. Fewer than half of students achieved the mark, with those that did correctly recognising that this would be a measurement of the amplitude of the sound signal or wave at a given point in time. There was some confusion between amplitude and frequency and a small number of students just described a sample as a measure of the sound.

Question part 4.2 was about the role of a Digital to Analogue Converter (DAC), a topic that has not often been examined. Whilst students are well versed in the idea of an Analogue to Digital Converter (ADC) they were less sure of the role of a DAC. Only a fifth achieved both marks on this question. Many did not make the point that loudspeakers can only use an analogue signal to produce sound although a number said that the reason was “so it could be heard” which was awarded a mark this time as benefit of the doubt.

Question part 4.3 was a slightly different way of asking about the concept of Nyquist’s theorem. Over three quarter of students realised this and responded with the correct answer of 1100 Hz.

Question 5

Question part 5.1 asked students to explain why digital files are often compressed. The most common correct responses were that they could be stored in less storage space or transmitted in a shorter amount of time. The answer “to make the file smaller” was accepted this year.

Question part 5.2 asked students to state the RLE for a given string of letters. The vast majority of students achieved this well, with some who did not get the mark missing the 1 from the 1W at the end.

Question 6

Question part 6.1 asked for definitions of hardware and software. The vast majority of students achieved both marks. As in previous years, a small number of students attempted to describe the concepts as being tangible and intangible, which was not markworthy.

Question part 6.2 asked students to describe the difference between system and application software. This was answered much less confidently than part 6.1 with only a third of students achieving both marks. A small number of students incorrectly describing software that was “in” the computer and software that was “downloaded”.

Question part 6.3 asked for two advantages of using a low-level language. Many students assumed that low-level was just machine code and too many concentrated on the idea that no translation was needed or that the language was faster because no translation was needed, which is not correct. The mark scheme accommodated students who stated that “machine-code” did not need translation.

Question part 6.4 asked students to state another low-level language apart from assembly language. Most students achieved the mark by stating “machine code”. Those who stated “binary” or “machine language” did not achieve the mark.

The final question part asked students to explain the role of an assembler and why it was needed. Only about a quarter of students achieved both marks here, recognising that assembly language needs to be translated and that it cannot be directly executed. A number of students stated that the computer does or does not “understand”, which is an incorrect application of the term “understand” to a computer.

Question 7

Question part 7.1 showed a logic circuit and asked students to name the type of logic gate used and describe the operation of that gate. Almost all students recognised an XOR gate, and more than three quarters were also able to describe its operation.

Following on from the previous question part, part 7.2 asked students to state the type of parity that the circuit computed and give a reason for this. Most students recognised this as even parity but far fewer were able to make reference to the circuit to explain their answer.

Question part 7.3 built on the previous two question parts and asked how two people could use the circuit to send a message to each other with a parity bit. Only a fifth of students achieved all three marks. Many students did not refer to how the circuit could be used to generate the parity bit and then to regenerate it and compare the results at the receiving end. General descriptions of what parity is and how it is calculated, that did not reference the circuit, were not creditworthy.

For question part 7.4, more than half of students were able to describe a limitation of parity bits. Students lost marks sometimes by stating that parity checks could not identify multiple bit errors, rather than more precisely identifying that parity checks could not identify an even number of bit changes.

Question 8

Question part 8.1 asked students to make a single application of De Morgan's laws and over three quarters were able to do this correctly. A common error was to remove the NOT bars from the expression.

Question part 8.2 asked students to draw a logic circuit from a given Boolean expression using only the gates specified. Over half of students achieved all three marks. Some students dropped a mark by using gates other than those specified in the question.

Question 9

This question was about the Fetch-Execute cycle.

For question part 9.1 students were asked to describe the role of the Memory Address Register (MAR) and the Memory Buffer Register (MBR). Approximately a quarter of students achieved both marks on this question. Confusion between the instruction and the address of the instruction was common and weaker answers often made vague references to data instead of an instruction.

Question part 9.2 asked students to describe the decode stage of the Fetch-Execute cycle. This was a challenging question with only a fifth of students achieving all three marks. A small number of students tried to describe the whole Fetch-Execute cycle which was not needed and as a result they often missed key elements of the decode part.

Question 10

Question part 10.1 asked students to complete one assembly language instruction. This was very well answered with only a small number of students not achieving the mark, usually by missing out the # in front of the number 13.

Question part 10.2 asked students to write an assembly language program to solve the described triangular numbers problem. This was quite well answered, with the majority of students achieving some marks. The most common error made by students who achieved three of the four available marks was to not initialise a register to zero before using it.

Question 11

Question part 11.1 asked students to write a description of the later aspects of the operation of a digital camera, starting from after the light was focussed on the light sensitive cells. Fewer than a fifth of students achieved all three marks and more than a third achieved no marks at all. The way that the individual cells on the sensor (known as photosites) are charged was not well understood and many students did not recognise that an ADC would be needed.

For question part 11.2 students had to describe how data is represented using solid-state storage. The proportion of students achieving two or three marks was similar to question part 11.1, but more students achieved no marks at all.

Question 12

This extended response question about an online image editing platform was a challenge to many students who often wrote a lot of words to little effect with long descriptions of one point, or one point made several times in the same answer. There was a fairly widespread belief that charging for an online service was unfair and that all services should be free so as not to discriminate against those with less money – a commentary on the capitalist system perhaps, but not a markworthy point in the context. Several students are still writing a generic introduction “there are many reasons...” and also summing up in a conclusion that has no new material from what has already been written. In addition to making multiple points, for this type of question students do need to expand on and describe their points, possibly giving examples to illustrate them.

Question 13

Question part 13.1 asked students to state what is meant by serial transmission. This was well answered but some students struggled to describe how bits are sent. More secure answers stated the use of a single wire.

Question part 13.2 asked students to explain how the bit rate on a serial cable could be greater than the baud rate. Only half of students achieved the mark by recognising that more than one bit could be represented by each signal change. “More than one bit per signal” was also accepted as a benefit of the doubt mark.

Question part 13.3 asked students to explain how a star network could behave as a logical bus network. It was not well understood and half of students did not get a mark. Bus network protocols were not mentioned often and the accept point of a hub transmitting data to all devices was frequently awarded despite the dated nature of hubs.

Question part 13.4 on SSID broadcast disabling has been asked about before and, as then, a number of students did not identify that when the broadcast is disabled the SSID is not sent out by the WAP or does not appear in the list of networks shown when trying to connect. Students sometimes described the network as “invisible” or “not able to be seen” which was not enough to describe the idea that the network was not in the list of available networks.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results Statistics](#) page of the AQA Website.