# Examiners' Report
# Principal Examiner Feedback

## Summer 2025

Pearson Edexcel International GCSE
In Computer Science (4CP0)
Paper 1

**Edexcel and BTEC Qualifications**

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

**Pearson: helping people progress, everywhere**

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Summer 2025
Publications Code 4CP0_01_2506_ER

## INTRODUCTION

This was the eighth series for this qualification. It has grown from approximately 450 candidates in 2019 to about 3,500 candidates for this series.

The format of the question paper continues to be a combination multiple choice, short open and extended open questions about the principles of computer science. It is intended that the structure of the paper is such that demand increases through each question and through the paper as a whole.

Candidates achieved scores throughout the range of possible marks, with some candidates demonstrating both excellent subject knowledge and contextual application. There were very few candidates who did not attempt all questions.

Multiple choice questions only have one correct answer as given in the mark scheme. Candidates need to be aware that their choice needs to be clear. If there are amendments to the choice, the discarded response needs to be clearly crossed through and leave only one obvious response.

Where candidates have used additional sheets, it is important that they clearly state to which question their response is made.

## REPORT ON INDIVIDUAL QUESTIONS

### Question 1: a question about networks and networking terms

1(a) Candidates were asked to complete a table with 4 statements associated with networking terms and identify which of 4 options matched the statements. This was mostly done correctly with many candidates scoring 4/4 marks.

Candidates should be reminded that where a multiple-choice question is being completed, it is important that they make clear which is their final response. Often examiners reported that more than one option was ticked or crossings out made it difficult for examiners to identify which response was the final response.

1(b) The question was about naming two of the layers of the TCP/IP protocol model. Candidates were given two of the four layers and were asked to state the names of the other two layers. Mostly done well, though incorrect responses of system layer, application layer and network layer were seen.

Candidates should be aware that no marks are given for answers that repeat values given in the question – including alternative names for those layers.

1(c) A multiple choice question about the protocol for sending an email. Most candidates correctly identified SMTP.

1(d) Candidates were asked to complete a diagram to show how devices would be connected in a star network. They were asked to complete the diagram with solid lines for a wired link and dotted (or dashed) lines for a wireless link. Many candidates were aware that the two desktop devices would be lined with a wired connection.

Less common was an understanding that the wireless access point would also be connected to the switch with a wired connection. Several candidates linked the laptop computer to either the desktop devices or the switch rather than through the wireless access point.

Quite a few candidates drew multiple lines (often trying to reproduce a star shape) to or from each device. On such occasions, candidates need to realise that multiple incorrect lines cost marks as examiners cannot be sure which was the intended response.

1(e) Candidates were asked to describe the purpose of penetration testing. Most candidates realised that this was to test the effectiveness of security measures for a network. However, some marks were lost due to the vagueness of the response. Some also misunderstood the question and responded about network signals penetrating through physical barriers.

**Question 2: a question about hardware and software**

2(a) Candidates were asked to identify two output devices found on smartphones. This was generally well answered by the majority of candidates. Where errors were made, it was due to incorrectly identifying a camera as an output device rather than an input device. Other errors occasionally seen included mention of peripheral devices such as printers and headsets.

2(b) Two questions about computer primary and secondary storage.

Part (i) was a multiple choice about using the space on a hard disk drive as additional memory. Many candidates failed to recognise virtual memory as the correct response.

Part (ii) asked for a description of the meaning of the term ‘cloud storage’. Most candidates were able to identify that this referred to online storage but didn’t get a second mark for not expanding on this statement.

2(c) The two parts of this question were about the fetch-decode-execute cycle.

Part (i) was generally well answered with many candidates correctly identifying three factors affecting the performance of the CPU.

Part (ii) was a less well answered description of the role of the address bus in the cycle. Several candidates were aware that it was used for transporting the address were less clear on where it got the address from and where it was taken. Several candidates mentioned that the address bus was unidirectional but then describe a two way process.

2(d) Questions about quantum computers are rarely answered well. This question about characteristics of quantum computers was poorly answered with many responses about the high cost or the need for large energy supplies.

**Question 3: a question about binary and storage of data**

3(a) This question consisted of three parts asking about binary and hexadecimal representations.

Part (i) asked candidates to convert a binary number into a hexadecimal number. This was generally answered well.

Part (ii) was a multi-choice question about characteristics of hexadecimal representations. There seemed to be some confusion with several candidates choosing the response hexadecimal values used less storage than binary.

Part (iii) required candidates to describe how binary shifts work when dividing a binary number. Again this seemed to be well answered with many correct responses.

3(b) This was a three-part question about storage of images.

Part (i) was asking for the smaller component of a bitmap image. This was generally well answered by the majority of candidates. Common incorrect responses included 'bit' and 'colour depth'.

Part (ii) asked candidates to construct an expression for the number of images like the one in the question that could be stored in 1KB. Most candidates scored at least one mark for including the multiplication of 16 by 16. Many then did not divide this value by 8 – for converting to bytes. Most common error was not to identify that the colour depth was 2 bits (not 3 which was commonly given). Many candidates who lost marks also divided by 1000 rather than the reciprocal.

Part (iii) was a question about the choice of run length encoding for compressing the image. Expected responses were about the repetition in the image and how the file size would be greatly reduced by this factor. Incorrect responses often included reference to lossless encoding.

3(c) A well-answered question about the pigpen cypher system. Few candidates didn't score 2 out of 2 for this question.

**Question 4: a question about solar panels and a battery storage system**

4(a) This question had three parts.

Part (i) was about the benefits of a 5G connection. Many candidates did not score higher marks on this question because they referred to the stability of the connection. Research suggests that this is not always the case. Some incorrectly responded with reference to 5GHz connections rather than 5$^{th}$ generation.

Part (ii) was a question about authentication of identity for the smartphone battery storage app. Many candidates scored at least one mark for this question for identifying that biometrics could be used. However, many didn't get the second mark for explicitly stating that the biometrics would be checked against a database or stored data. Other candidates mentioned two factor authentication but weren't explicit enough in explaining that a code had to be entered into a second device or app.

Part (iii) asked about reasons for carrying out code reviews of the applications. Many candidates correctly identified identifying errors and vulnerabilities in the code. Fewer candidates responded with answers relating to improving efficiency in the code.

4(b) Part (b) of question 4 asked candidates to identify the highest and lowest binary and denary numbers that can be represented in an 8-bit binary pattern using sign and magnitude format. This question was poorly answered with many candidates unable to identify that the first bit was the sign so would be discounted in working out the size of the denary value.

4(c) This question was about the logic of the program controlling the solar panels and battery storage and the storage of the instructions in the program. It consisted of two parts.

Part (i) gave candidates the criteria for the solar panels and battery storage system to be on and were asked to show how the criteria could be analysed using a truth table. The candidates were given the 8 options of how the system might work and asked to complete the logic of the criteria. Some candidates did not use the symbols (ones [1] and zeros [0]) in the given information to complete the table and so did not gain credit.

Part (ii) asked candidates to explain why the start-up instructions were stored in ROM. Many candidates correctly identified that ROM was permanent or non-volatile memory but failed to gain the second mark for explaining why this was important – that the instructions would not be lost in the event of a power failure.

**Question 5: a question about smartwatches and wearable technology**

5(a) Part (a) of the question was about embedded systems in smartwatches. It consisted of two parts.

Part (i) gave candidates the example of an accelerometer and its purpose and asked candidates to identify one other built-in sensor a smartwatch could use and its purpose. Many candidates mentioned heart rate monitoring but did not expand on the purpose but instead repeated that the purpose was to measure the heart rate.

Part (ii) asked candidates to identify two characteristics of an embedded system making it suitable for use in a smartwatch. Many candidates identified that the embedded system would have specific task to perform. Fewer candidates scored both marks as their responses were sometimes too vague or repeated the example given in the question.

5(b) This question consisted of four parts, two of which were multiple choice questions – the correct answers of which are in the marks scheme as well as the reasons why the other responses are incorrect..

Part (ii) asked about the benefits of writing the software in a low-level language. This question was generally poorly answered with many responses referring to the time for translation of the low-level language to machine code or the ease of writing the code. Responses required were related to the efficiency of managing the hardware by having more direct access to the hardware features.

Part (iii) asked candidates to identify ways that software developers could demonstrate ethical behaviour in the work. ‘Behaving ethically’ was not enough for credit as this was in the question. Many candidates correctly identified maintaining and enhancing their skills by attending relevant conferences.

5(c) This question asked candidates to discuss the ways in which wearable technology can be a benefit to health. There were many excellent answers to this question showing a good understanding of the range of wearable technology available. Weaker responses only referred to items raised in previous questions such as step count mentioned in question 5(a) with little or no development of how this might be a benefit tot health.

**Question 6: a question about algorithms**

6(a) Candidates were asked to draw a flowchart to represent an algorithm. There was a full range of marks awarded for this question. Many candidates did not gain marks because they did not produce a flow chart but rather produced a pseudocode response. Others did not gain marks for some marking points because they did not include arrow heads and/or yes and no labels on lines from decision boxes. There were also lost marks because candidates did not use the conventional symbols for input/output and decision boxes. Some candidates included an extra unnecessary decision box to determine whether the value was greater than 0 and whether the value was less than 0 having already determined that the value was not zero. It was expected that candidates would use mathematical expressions in the decision boxes rather than text.

6(b) This question consisted of four parts about a pseudocode algorithm.

Parts (i) and (ii) asked candidates to complete trace tables for the input of two numbers into the algorithm.

It was unfortunate that the pseudocode included an error in the logic that meant that no output would ever be displayed with any number input.

It was decided to mark the responses based on the pseudocode in the paper. The correct responses therefore were therefore expecting the DISPLAY column to include no content. Some candidates did not gain marks for the first two parts of the question because they started their trace table with the testNum set to two rather than 1.

Part (iii) questioned candidates to identify the purpose of the algorithm. Most candidates correctly identified that the purpose was to identify prime numbers. Other acceptable responses were to determine the lowest factor other than 1 for a number input.

Part (iv) asked candidates about the reasons for using a post-conditioned loop rather than a count-conditioned loop. Candidates often referred to count-controlled loops having a fixed number of iterations which might not be enough or might be too many but failed to recognise that the count might be determined by the input value.

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom