Pearson

Mark Scheme (Results)

Summer 2026

Pearson Edexcel GCSE in Computer Science

1CP2_01

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed-out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question Number	Answer	Additional Guidance	Mark
1(a)	Award **one** mark for any of the following up to a maximum of **two** marks: • Licencing (1) • Copyright (1) • Patent (1)	Do not allow Trademark Allow examples of licencing e.g. creative commons	**(2)**

Question Number	Answer	Additional Guidance	Mark
1(b)	Award **one** mark for any of the following up to a maximum of **two** marks: • right to be informed (about data collection/use) (1) • right of access (to personal data) (1) • right to have incorrect data updated/amended (1) • right to restrict processing (1) • right to data portability (1) • right to object (to how personal data is processed) (1) • right to withdraw consent (1)	Do not accept right to be forgotten (which is given in the question). Allow rights bestowed by companies meeting their responsibilities: • to have data collected in a fair manner • to have data only used for specified purposes • to have data kept up to date • to have data kept no longer than necessary • to have data kept private/secure	**(2)**

		• to be asked for consent to collect/use	

Question Number	Answer	Additional Guidance	Mark
1(c)	**The only correct answer is D** *A is not correct because a keylogger only records key strokes* *B is not correct because a trojan hides malicious code* *C is not correct because a virus has to be activated by a user*	The correct answer is Worm	**(1)**

<table>
<tr><th>Question Number</th><th>Answer</th><th>Additional Guidance</th><th>Mark</th></tr>
<tr><td>1(d)</td><td>Award one mark for each correct cell:

<table>
<tr><th>Description of attack</th><th>Social engineering method</th></tr>
<tr><td>Josh receives an email that appears to come from his bank.

The email contains a link to a fake website.</td><td>Phishing (1)</td></tr>
<tr><td>Nina has a message pop up on her computer saying it has a virus.

The message has a link to a website that offers to fix her computer for free.</td><td>Quid pro quo (1)

Scareware (1)</td></tr>
<tr><td>Arav receives a call from someone claiming to be from his phone company.

He is asked to confirm his personal details.</td><td>Blagging (1)

Pretexting (1)

Spear phishing / vishing (1)</td></tr>
<tr><td>Livi visits a website and is told that she is today's winner.

She is asked to enter her login details.</td><td>Baiting (1)</td></tr>
</table></td><td>Do not allow phishing on its own for 3rd scenario described.</td><td>(4)</td></tr>
</table>

Question Number	Answer	Additional Guidance	Mark
1(e)	Award up to **two** marks for a linked explanation such as: • Unfair results/outcomes are produced (1) because training is based on limited/unrepresentative/inaccurate data (1) • Some results/outcomes are more common/favoured (1) because systems are not based on a wide range of data (1) • Deliberately/unconsciously unfair results/outcomes are produced (1) because systems are programmed/coded based on prejudiced design (1)	Do not allow responses that reword the question by stating bias without expansion. Allow examples of types of unfair/undesirable outcomes for an identification point and then an associated example reason. e.g. facial recognition may lead to some ethnic groups being unfairly targeted (1) because training data disproportionally used images of people from that group (1)	**(2)**

Question Number	Answer	Additional Guidance	Mark
2(a)(i)	Award **one** mark for any of the following up to a maximum of **two** marks: • A named location/identifier (1) • Stores a value (1) • Has a data type (1) • (Stored value) can be changed during program execution (1)		**(2)**

Question Number	Answer	Additional Guidance	Mark
2(a)(ii)	Award **one** mark for each correct cell: | Example	Type of operator | | ** // | Arithmetic (1) | | AND OR | Logical/Boolean (1) | | == >= | Relational (1) |	Allow logic for logical Allow comparison/comparative for relational	**(3)**

Question Number	Answer	Additional Guidance	Mark
2(b)	***The only correct answer is D*** *A is not correct because a diagram representing an algorithm is a flowchart* *B is not correct because a language that has a specific syntax is a programming language* *C is not correct because a problem broken down into smaller more manageable parts is decomposition*	The correct answer is an informal written description of an algorithm.	**(1)**

Question Number	Answer	Additional Guidance	Mark
2(c)	Award **one** mark for each correct cell: 	Input	Output
---	---
8	Light (1)
12	Dark (1)		Ignore case Ignore quotation marks	**(2)**

Question Number	Answer	Additional Guidance	Mark
2(d)	Award **one** mark for any of the following up to a maximum of **two** marks: • Division by zero (1) • Square root of negative number (1) • Missing file (1) • Array index out of bounds (1) • Type mismatch (on data input/assignment/casting) (1) • Out of memory / stack overflow (1) • Variable referenced before initialisation (1)	Allow examples for type mismatch	**(2)**

<table>
<tr><th>Question Number</th><th>Answer</th><th>Additional Guidance</th><th>Mark</th></tr>
<tr><td>2(e)</td><td>Award one mark for each correct row:

• Swap 1 – Orange in first cell, Red in second cell (1)
• Swap 2 – Green in second cell, Red in third cell (1)
• Swap 3 – Green in first cell, Orange in second cell (1)

<table><tr><th>Swap</th><th>Red</th><th>Orange</th><th>Green</th><th>Yellow</th></tr><tr><td>1</td><td>Orange</td><td>Red</td><td>Green</td><td>Yellow</td></tr><tr><td>2</td><td>Orange</td><td>Green</td><td>Red</td><td>Yellow</td></tr><tr><td>3</td><td>Green</td><td>Orange</td><td>Red</td><td>Yellow</td></tr></table></td><td>If the first row of the candidate solution does not match either Swap 1 or Swap 2 in the table award 0 marks.

If a candidate has given the result of the first pass (row 2 of table) as the first row of their solution award BP2 and then check for final swap</td><td>(3)</td></tr>
</table>

Question Number	Answer	Additional Guidance	Mark
2(f)	Award up to **two** marks for a linked explanation such as: • Merge sort will have a higher memory overhead (1) because additional lists are created on each split (1) • Merge sort will use more storage space (1) because it is out-of-place (1)	Allow one-sided descriptions that imply the opposite of what is given. • Bubble sort will have a lower memory overhead (1) because it is in-situ (1) • Bubble sort will use less storage space (1) because its storage requirements are constant (1)	**(2)**

Question Number	Answer	Additional Guidance	Mark
3(a)	Award **one** mark for any of the following up to a maximum of **two** marks: • (Two or more) computers/devices connected together (1) to communicate / share data/information/resources (1)		**(2)**

Question Number	Answer	Additional Guidance	Mark
3(b)	**The only correct answer is B** *A is not correct because the delay between a signal being sent and received is latency* *C is not correct because the maximum distance a signal can reach is range* *D is not correct because protocols define the rules for data transmission*	The correct answer is the maximum capacity of a network channel.	**(1)**

Question Number	Answer	Additional Guidance	Mark
3(c)(i)	Award **one** mark for: (Fully connected) mesh (1)	Allow partial mesh on this occasion.	**(1)**

Question Number	Answer	Additional Guidance	Mark
3(c)(ii)	Award **one** mark for any of the following up to a maximum of **two** marks: • Fault-tolerant / packets/messages have many potential routes / if one node/path fails the rest of the network will continue to function (1) • Nodes can be added/removed without taking the network offline (1) • (Highly) scalable/extendable (1) • High performance / low latency / superior traffic handling / with direct routes between nodes (1) • High security / privacy (1)	Allow no need for central server as fault tolerant on this occasion.	**(2)**

Question Number	Answer	Additional Guidance	Mark
3(d)	Award up to **two** marks for a linked description such as: • Usernames/passwords/credentials are given to the testers (1) to test internal policies/procedures (1) • Simulate an inside/disgruntled employee attack (1) to test internal access rights/controls (1) • Testers have knowledge of the code/systems (1) to test all pathways/features/logic (1)	Do not award credit for generic descriptions of penetration testing.	**(2)**

Question Number	Answer	Additional Guidance	Mark
3(e)	Award **four** marks for: • Fully correct expression (4) or Award **one** mark for any of the following up to a maximum of **three** marks: • 40 x 60 (seconds) (1) • 5.5 x 1000^2 (megabits) (1) • 8 x 1024^3 (bits in a gibibyte) (1) Examples of fully correct expressions: $\frac{(40 \times 60) \times (5.5 \times 1000^2)}{8 \times 1024^3}$ $\frac{(40 \times 60) \times (5.5 \times 1000^2) / 8}{1024^3}$ $\frac{40 \times 60 \times 5.5 \times 1000 \times 1000}{8 \times 2^{30}}$	Accept equivalent answers such as $1000^2 = 10^3 \times 10^3 = 10^6$ $1024^3 = 2^{10} \times 2^{10} \times 2^{10} = 2^{30}$ Allow sight of 2400 for 40 x 60 5.5 x 1000^2 = 5,500,000	**(4)**

Question Number	Answer	Additional Guidance	Mark
4(a)(i)	Award **one** mark for: • 100 (1)	Allow the expression 10 x 10 on this occasion.	**(1)**

Question Number	Answer	Additional Guidance	Mark
4(a)(ii)	Award **one** mark for: • 2 (bits) (1)		**(1)**

Question Number	Answer	Additional Guidance	Mark
4(a)(iii)	Award **one** mark for each of: • Image A – the file size will increase/double (1) • Image B – the file size will stay the same / will not change (1)		**(2)**

Question Number	Answer	Additional Guidance	Mark
4(a)(iv)	Award **one** mark for each of: • Number of pixels x colour depth in numerator (1) • 8 in the denominator (1) Example: $\frac{\text{Number of pixels x colour depth}}{8}$ $\frac{\text{height x width x colour depth}}{8}$	Max 1 mark if expression is not fully correct Accept height x width (or equivalent) for total number of pixels Accept bit depth for colour depth Allow image size/resolution for number of pixels Allow actual values if candidate has tried to calculate the size of image A or B instead of giving a generic expression: (100 x 1) / 8 Or (100 x 2) / 8	**(2)**

Question Number	Answer	Additional Guidance	Mark
4(b)	Award **one** mark for any of the following up to a maximum of **two** marks: • Sample rate (1) • Sample interval (1) • Bit depth per sample (1) • Number of channels (1) • Encoding/compression method (1)	Allow bit rate (bit rate = sample rate x bit depth)	**(2)**

Question Number	Answer	Additional Guidance	Mark
4(c)(i)	Award **one** mark for each correct nibble in the correct order: • 1110 1001 0 1 1 1 0 0 1 0 0 1 1 1 0 1 1 1 1 1 1 0 1 0 0 1		**(2)**

Question Number	Answer	Additional Guidance	Mark
4(c)(ii)	**The only correct answer is B** *A is not correct because an arithmetic shift left one place multiplies a signed number by two.* *C is not correct because a logical shift left one place multiplies an unsigned number by two.* *D is not correct because a logical shift right divides an unsigned number by two.*	The correct answer is arithmetic shift right one place	**(1)**

Question Number	Answer	Additional Guidance	Mark
4(c)(iii)	Award **one** mark for: • M (1)		**(1)**

Question Number	Answer	Additional Guidance	Mark
4(c)(iv)	Award **one** mark for: • - (1) • 12 (1)	The correct answer is -12	**(2)**

Question Number	Answer	Mark
4(d)	Indicative content **Definition** • Lossless compression reduces file sizes without deleting any data. The original file can be reproduced exactly. • Lossy compression reduces file sizes by permanently deleting some data. The original file cannot be exactly reproduced. **Applications** • Lossless compression will be essential for video games where the original code must be maintained for programs to be executed. • Lossless compression can be used with Run Length Encoding (RLE) for graphics with few colours and long runs of repeated pixels such as GIF and PNG files.	

	• Lossless compression can use dictionary encoding to effectively compress text. • Lossy compression can be used for photographic images and sampled sound where there are slight changes in the data that are often not clearly distinguishable. • Lossy compression is used in JPG graphic files, MP3 audio and MP4 video files. **Benefits** • Lossless compression can achieve good results with files that contains groups of repeated data. • Lossless compression means that the original data can be reproduced for applications where this is essential. • Lossy compression can achieve very high compression ratios without discernible difference. • Lossy compression can be used where the human eye/ear will not notice small elements that have been removed without perceptible loss of quality. • Compressed files will take up less storage space. • Compressed files will take less time to transmit and can be streamed more reliably	**(6)**

Level	Mark	Descriptor
	0	No rewardable content
Level 1	1-2	Basic, independent points are made, showing elements of understanding of key concepts/principles of computer science. (AO1) The discussion will contain basic information with little linkage between points made or application to the context. (AO2)

Level 2	3-4	Demonstrates adequate understanding of key concepts/principles of computer science. (AO1) The discussion shows some linkages and lines of reasoning with some structure and application to the context. (AO2)
Level 3	5-6	Demonstrates comprehensive understanding of key concepts/principles of computer science to support the discussion being presented. (AO1) The discussion is well developed, with sustained lines of reasoning that are coherent and logically structured, and which clearly apply to the context. (AO2)

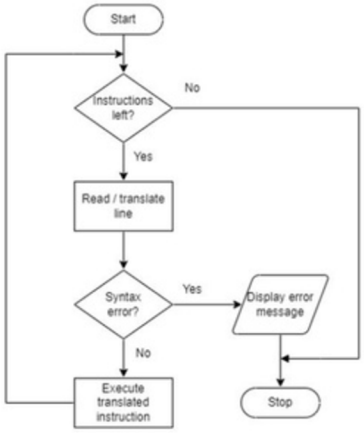
Question Number	Answer	Additional Guidance	Mark
5(a)	Award **one** mark for any of the following up to a maximum of **three** marks: • User profiles/accounts (1) • User authentication/logins (through passwords/biometrics) (1) • Resource allocation rights (to storage space on shared areas / hardware / software) (1) • To control access to files/folders (through file permissions) (1)	Do not award user interface / file management	**(3)**

Question Number	Answer	Additional Guidance	Mark
5(b)	Award up to **two** marks for a linked explanation such as: • (Mobile phones) will not be damaged easily if dropped/knocked / are highly portable (1) because solid state storage has no moving parts (1) • (Mobile phone) battery life will be extended (1) because solid state storage has low power consumption (1) • (Mobile phone) apps will be more responsive for the user (1) because solid state storage has fast read/write times (1) • Fits into the limited space available in a mobile phone (1) because it is very compact (1)		**(2)**

Question Number	Answer	Additional Guidance	Mark
5(c)	Award up to **two** marks for a linked description such as: • Synchronises/regulates the actions of the CPU (1) by triggering the start of each cycle (1) • Sends a regular signal/pulse/tick (1) that determines the number of cycles per second (1) • An instruction is fetched/decoded/executed (1) on each clock tick/pulse (1)	Do not accept responses relating to how clock speed affects performance.	**(2)**

Question Number	Answer	Additional Guidance	Mark
5(d)	Award up to **two** marks for a linked description such as: • (Signature-based systems) use a database (of code patterns) (1) to compare against (known) files to see if there is a match (1) • (Behaviour-based systems) apply heuristics/rules (1) to determine if programs are acting suspiciously (1) • Runs file in a sandbox (1) to see if behaviour is suspicious (1)		**(2)**

Question Number	Answer	Additional Guidance	Mark
5(e)	Award up to **two** marks for a linked description such as: • Data input can be validated (1) to check that it meets specific criteria (1) • Software can be programmed to handle unexpected events without crashing (1) by using exception handling / error handling routines (1) • Software can be programmed to check for security vulnerabilities (1) by parsing user input (1)	Allow examples of dealing with invalid/unexpected inputs.	**(2)**

Question Number	Answer	Additional Guidance	Mark
5(f)	Award **one** mark for any of the following up to a maximum of **six** marks: • Program code is read/input (1) • Syntax errors are checked for (1) • Output an error when a syntax error is found (1) • Translate/execute valid line code (1) • Loop/repeat for each line of code (1) • Start and Stop symbols, at least one decision box with exactly two correctly labelled outputs, all arrows are directed, and there are no hanging symbols (1)  	MP3 and MP4 are dependent on MP2 and must clearly follow as a consequence of the syntax check. MP4 must be clear that it is an individual line of code being translated/executed. MP6 is independent of the previous mark points. Allow start/begin Allow stop/end/finish Allow True/False for Yes/No	**(6)**