Chhetri Academy

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GCSE COMPUTER SCIENCE

5.2

Edexcel 1CP2 | Specification point 5.2.3

Methods of intellectual property protection for computer systems and software (copyright, patents,...

Untiered

Answers and examiner comments

3	2023-2025	Untiered
question groups	available papers	tier

Using this booklet

1. Answer numbers match the companion question booklet.
2. Follow the original question number on marking tables.
3. Examiner comments are included where available.

Name _____ **Date** _____

Some entries use full source marking material in an appendix. Any unavailable mark schemes are identified beside the relevant answer.

Question Number	Answer	Additional Guidance	Mark
3(a)	Award up to two marks for a linked explanation, such as: • Worms make copies of themselves (1) and send them to everyone in the computer's email contacts list / send them via previous connections used by the computer (1) • Worms can spread (themselves) through emails (1) and do not need a user to unknowingly distribute/execute them (1) • Worms self-replicate (1) and spread without the need for a host file (1)	For both marks, the expansion must associate with the statement. Do not accept: Worms spread through links in emails.	(2)

Question Number	Answer	Additional Guidance	Mark
3(b)	Award one mark for: • Licensing (1)		(1)

Question Number	Answer	Additional Guidance	Mark
3(c)	Award up to two marks for a linked explanation, such as: • The landing program may crash / display incorrect data / not deal with extreme scenarios (weather / wind / animal / visual / emergency) (1) because: • the system could be out of date / have errors / bugs / not been tested enough • the scenario is beyond the range of what it has been programmed to respond to (1) • A computer's input may be wrong/compromised (1) because of a sensor/hardware/mechanical error (1) • A computer cannot make moral/ethical judgements (1) because it is only capable of following instructions (1)	For both marks, the expansion must associate with the statement.	(2)

Question Number	Answer	Additional Guidance	Mark
3(d)	Award up to two marks for a linked description, such as: • The land/rivers/seas will be polluted (1) if contaminated/uncleaned waste water is released (1) • Homes/businesses/agriculture/wildlife/people may not have enough water (1) if too much is taken from the rivers/reservoirs (1) • Water is polluted/contaminated (during the manufacturing process) (1) and could pose a health risk (1) • Large amounts of energy is required (to extract/clean water) (1) resulting in more use of CO2 / CO2 contributes to global warming (1)	For both marks, the expansion must associate with the statement. Do not accept responses that refer to global warming due to the use of water without implying associated energy use.	(2)

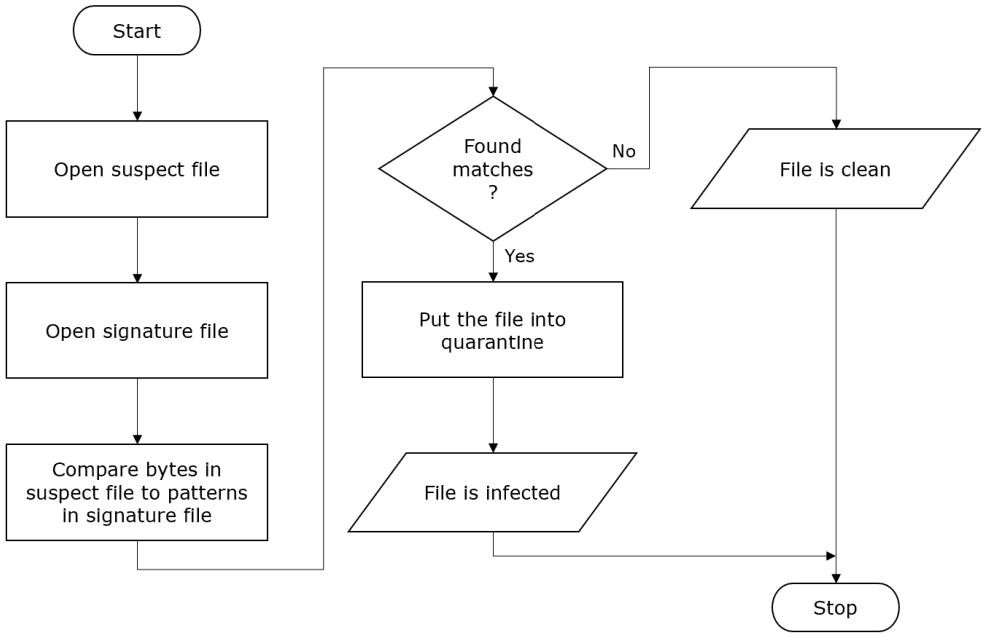
<table>
<tr><th>Question Number</th><th>Answer</th><th>Additional Guidance</th><th>Mark</th></tr>
<tr><td>3(e)</td><td>Award one mark for each correct cell:
<table>
<tr><th>Situation</th><th>Ethical or legal concern</th></tr>
<tr><td>A teacher uses another teacher's login to change student grades</td><td>Misuse (1)
Hacking (1)
Unauthorised access/changing/ editing/modification (1)</td></tr>
<tr><td>A school displays closed-circuit television (CCTV) screens in a public area</td><td>Privacy (1)
Consent/Permission (1)
Data Protection / GDPR / General Data Protection Regulations (1)</td></tr>
</table></td><td></td><td>(2)</td></tr>
</table>

Question Number	Answer	Additional Guidance	Mark
5(a)	Award up to two marks for a linked description, such as: • Shorter replacement cycles lead to devices being disposed of more often (1), which leads to more e-waste/landfill / pollution (1) • Shorter replacement cycles lead to more manufacturing (1), which incurs increased extraction of metals/increased use of water to manufacture chips/use of fossil fuels (1) • Long replacement cycles mean devices are not disposed of (1), which reduces the amount of e-waste/landfill / emissions (1) • Long replacement cycles mean fewer devices are manufactured (1), which reduces the need for extraction of metals / the need for water to manufacture chips / less energy required (1)	For both marks, the expansion must follow/associate with the statement.	(2)

<table>
<tr><th>Question Number</th><th>Answer</th><th>Additional Guidance</th><th>Mark</th></tr>
<tr><td>5(b)</td><td>Award one mark for each correct cell:

<table><tr><th>Intellectual property</th><th>Method of protection</th></tr><tr><td>A hardware invention</td><td>Patent (1)</td></tr><tr><td>An advertising slogan</td><td>Trademark (1)
Copyright (1)</td></tr></table></td><td></td><td>(2)</td></tr>
</table>

Question Number	Answer	Additional Guidance	Mark
5(c)	Award up to two marks for a linked explanation such as: • The wipers/lights come on automatically (1) because sensors detect rain/darkness (1) • Speed is automatically adjusted/brakes are applied automatically / alarm sounded (1) because sensors detect distance from other cars/obstacles/people (1) • The temperature is adjusted automatically (1) because a sensor/thermometer monitors the change in the temperature of the passenger compartment/car interior (1)	For both marks, the expansion must follow/associate with the statement.	(2)

Question Number	Answer	Additional Guidance	Mark
5(d)	Award one mark for any of the following up to a maximum of six marks: • load virus signature file/database (1) • scan/compare target file (for virus signature) (1) • decide if a virus has been detected (1) • quarantine/isolate/fix/delete file when virus detected (1) • no further action required if virus not detected (1) • all decision boxes have exactly two labelled outputs and all arrows are directed and there are no hanging symbols (1) 	BP2 must be clear how the virus is detected, not just 'detect virus'	(6)

Question Number	Answer	Additional Guidance	Mark
3(a)(i)	**The only correct answer is A** *B is not correct because gaining consent is an issue with collecting and storing data* *C is not correct because copyright is an issue with ownership of digital assets* *D is not correct as no intellectual property law is broken*	The correct answer is computer misuse	**(1)**

Question Number	Answer	Additional Guidance	Mark
3(a)(ii)	Award **one** mark for any of the following up to a maximum of **three** marks: • Consent must be obtained/given to collect data (1) • Individuals have a right to have data removed/withdraw consent (1) • Individuals have a right to see data held on them (1) • Data can only be collected for a specified purpose (1) • Only necessary data may be collected (1) • Data must be accurate (1) • Data must be kept up to date (1) • Data may not be kept for longer than necessary (1) • Data must be kept securely (1) • Data cannot be shared with third parties without consent (1) • Data controllers must be able to prove data protection measures are sufficient. (1)		**(3)**

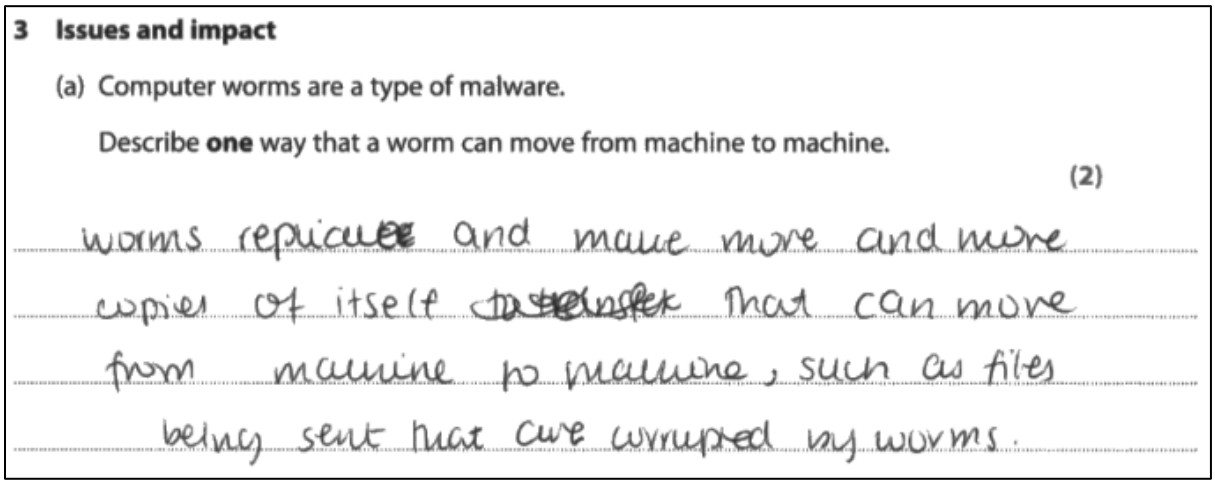
Question Number	Answer	Additional Guidance	Mark
3(b)	Award **one** mark for any of the following: • Source code is accessible (1) • Source code can be edited (1) • Source code can be amended/redistributed (1) • Support may not be provided (1)	Do not award free/costs no money	**(1)**

3(c)(i)	Award **two** marks for a linked explanation such as: • Users are deterred from unsafe practices (1) because consequences are clarified (1). • People follow safe/good practices (1) because permitted activities are defined/set out (1). • Users will follow the rules of the policy (1) because they want to keep their files safe (1)	For both marks, the expansion must follow/associate with the statement. Accept responses that use examples. e.g. AUPs contain guidance such as to not open links from unknown sources (1) to prevent malware infection (1)	**(2)**

Question Number	Answer	Additional Guidance	Mark
3(c)(ii)	**The only correct answer is C** *A is not correct because a keylogger only records key strokes* *B is not correct because a trojan masquerades as another file type* *D is not correct because a worm runs by itself*	The correct answer is Virus	**(1)**

Question 3a

The idea of worms self-replicating was the main correct response provided by students. Lots of incorrect responses were mostly confusing worms with a virus.



3 **Issues and impact**

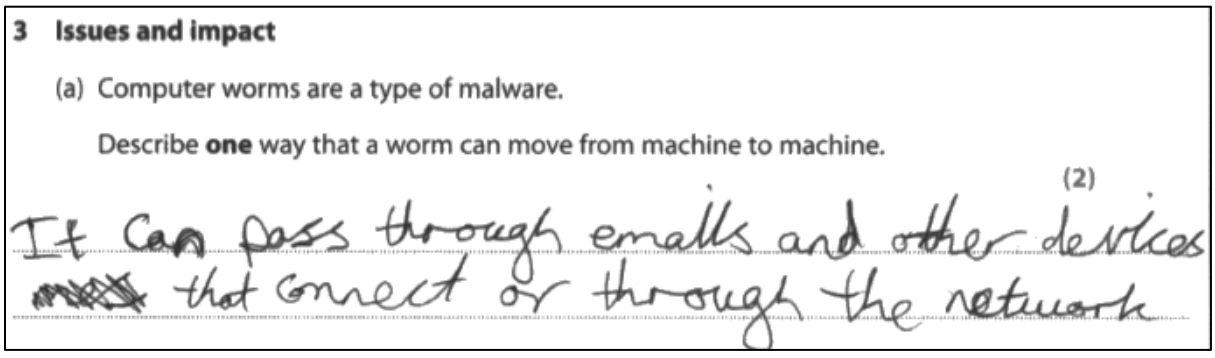
(a) Computer worms are a type of malware.

Describe **one** way that a worm can move from machine to machine.

(2)

worms replicate and make more and more copies of itself ~~to transfer~~ that can move from machine to machine, such as files being sent that are corrupted by worms.

'Worms replicate and make more and more copies of itself', scored 1 mark. A second mark was not awarded as there is no correct reference to how worms move (worms do not require a host file in the same way a 'trojan' virus does).



3 **Issues and impact**

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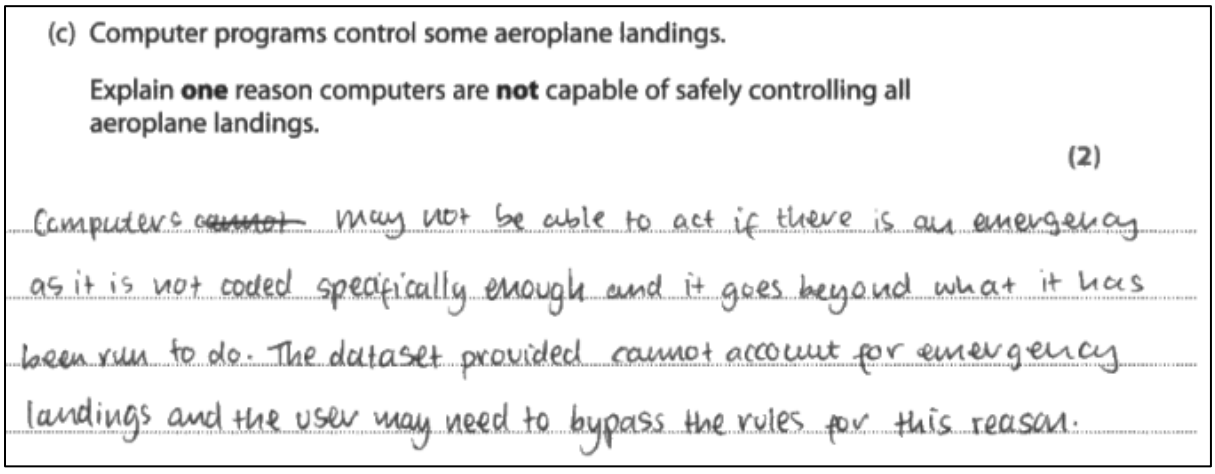
(2)

It can pass through emails and other devices ~~which~~ that connect or through the network

This response also scored 1 mark.

Question 3c

Many responses were related to weather, but only few made references to extreme weather events. This meant that marks could not be awarded for this alone.



(c) Computer programs control some aeroplane landings.

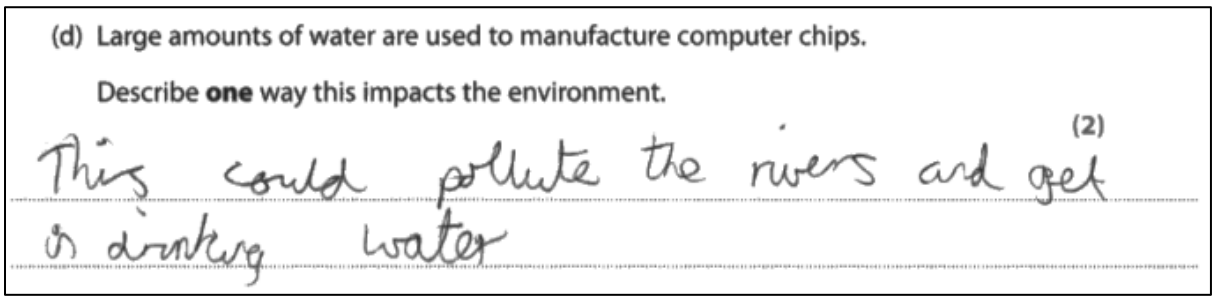
Explain **one** reason computers are **not** capable of safely controlling all aeroplane landings.

(2)

Computers ~~cannot~~ may not be able to act if there is an emergency as it is not coded specifically enough and it goes beyond what it has been run to do. The dataset provided cannot account for emergency landings and the user may need to bypass the rules for this reason.

This response score 2 marks; 1 mark for 'may not be able to act if there is an

Many responses correctly identified that the rivers would be polluted or showed understanding that the scarcity of water due to use in chip manufacturing would impact the environment. However, responses on how this would affect the environment was rather mixed. For example, there were lots of responses mentioning drought as a major impact of using large amounts of water to manufacture chips.


(d) Large amounts of water are used to manufacture computer chips.

Describe **one** way this impacts the environment.

(2)

This could pollute the rivers and get in drinking water

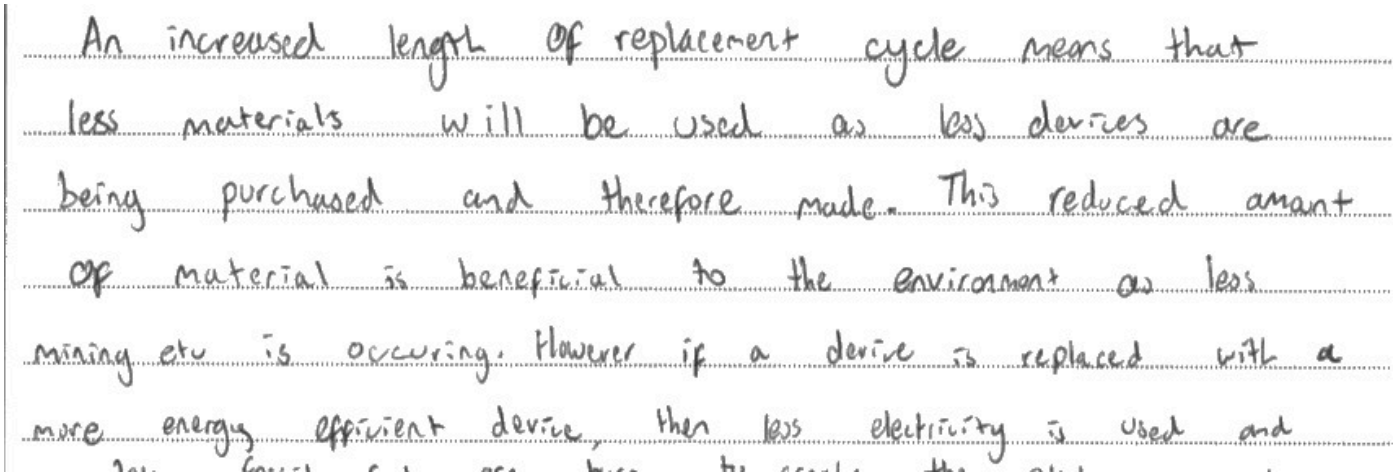
This response scored 2 marks. 1 mark for 'this could pollute the rivers' and 1 mark for 'get in drinking water', as this implies posing a risk to people.

Question 3e

The most common response from box 1 was misuse / unauthorised access. Many responses mentioned consent and privacy for box 2.

Question 5 (a)

This question was generally well answered and many candidates produced good responses to demonstrate a clear understanding of environmental issues. Whilst many candidates did score 1 mark they sometimes found it harder to give the linked expansion of the point they made for the second mark.


An increased length of replacement cycle means that less materials will be used as less devices are being purchased and therefore made. This reduced amount of material is beneficial to the environment as less mining etc is occuring. However if a device is replaced with a more energy efficient device, then less electricity is used and

ResultsPlus Examiner Comments

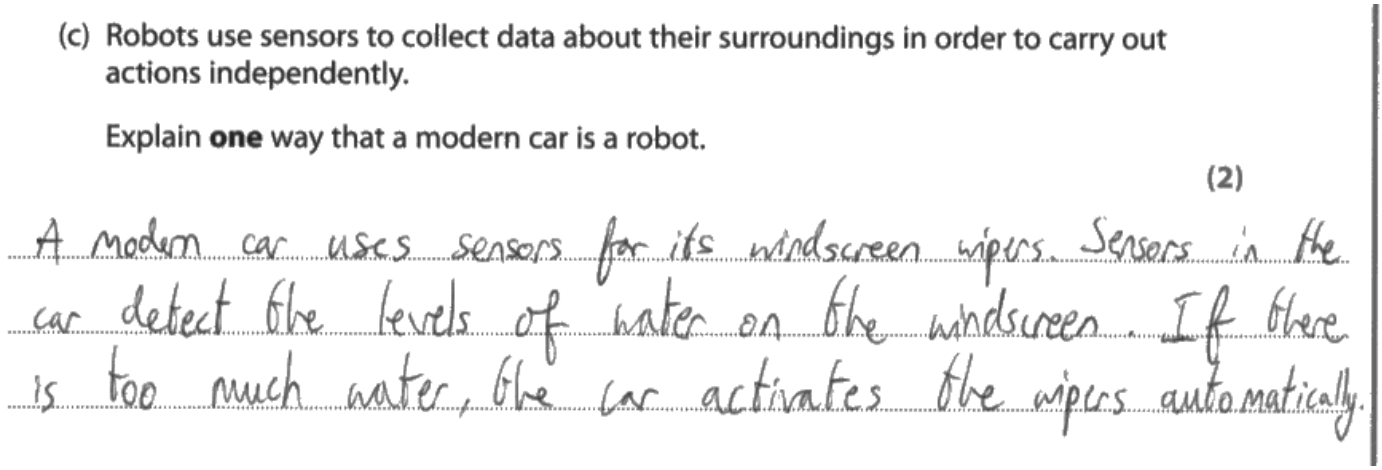
This response scores 2 marks for clearly identifying that increased cycle length means less production and that this means less material needs to be mined.

Question 5 (b)

Many candidates correctly identified that an advertising slogan can be protected by either a trademark or copyright. Fewer candidates were able to identify that hardware inventions can be patented.

Question 5 (c)

Many candidates were familiar with the concept of automated systems in the context of a car and could give good examples of how sensor readings would be used as the basis for a dependent action. Weaker responses tended to be generic, such as self-driving cars, without identifying the actual systems within the car that enabled this to be the case.



(c) Robots use sensors to collect data about their surroundings in order to carry out actions independently.

Explain **one** way that a modern car is a robot.

(2)

A modern car uses sensors for its windscreen wipers. Sensors in the car detect the levels of water on the windscreen. If there is too much water, the car activates the wipers automatically.

ResultsPlus
Examiner Comments

This response scores 2 marks for identifying that windscreen wipers can be activated automatically when a rain sensor detects rain.

Question 5 (d)

Many candidates made a reasonable attempt to produce a recognisable flowchart. Some common errors included not showing directional arrows on flow lines, having decision boxes that did not have exactly two clearly labelled outputs and leaving hanging symbols.
Relatively few candidates knew the more theoretical knowledge required to state that a virus checker uses a signature library/database and that the target file is scanned/compared to this database to see if there is potential malware, so were limited to 4 marks at most. Most candidates started their responses with a decision being made as to whether the file had a virus or not without covering the preceding steps.

ResultsPlus
Examiner Comments

This response scores 6 marks for a very clear and well-constructed solution that covers each of the mark points.

Paper Summary

Based on their performance on this paper, candidates are offered the following advice:

- Learn and use clear definitions for technical terms within the specification.
- Read and interpret the question prompt to focus on the specific requirements and provide more relevant responses that address the critical aspects of the question.
- Where a context or scenario is provided, respond by using the contextual information in the question.
- Expand and explain answers using examples and reasons, especially where more than a simple statement or list is requested.
- Familiarise yourself with the appropriate symbols and conditions to ensure clarity and accuracy in diagrammatic representations of algorithms when using flowcharts.

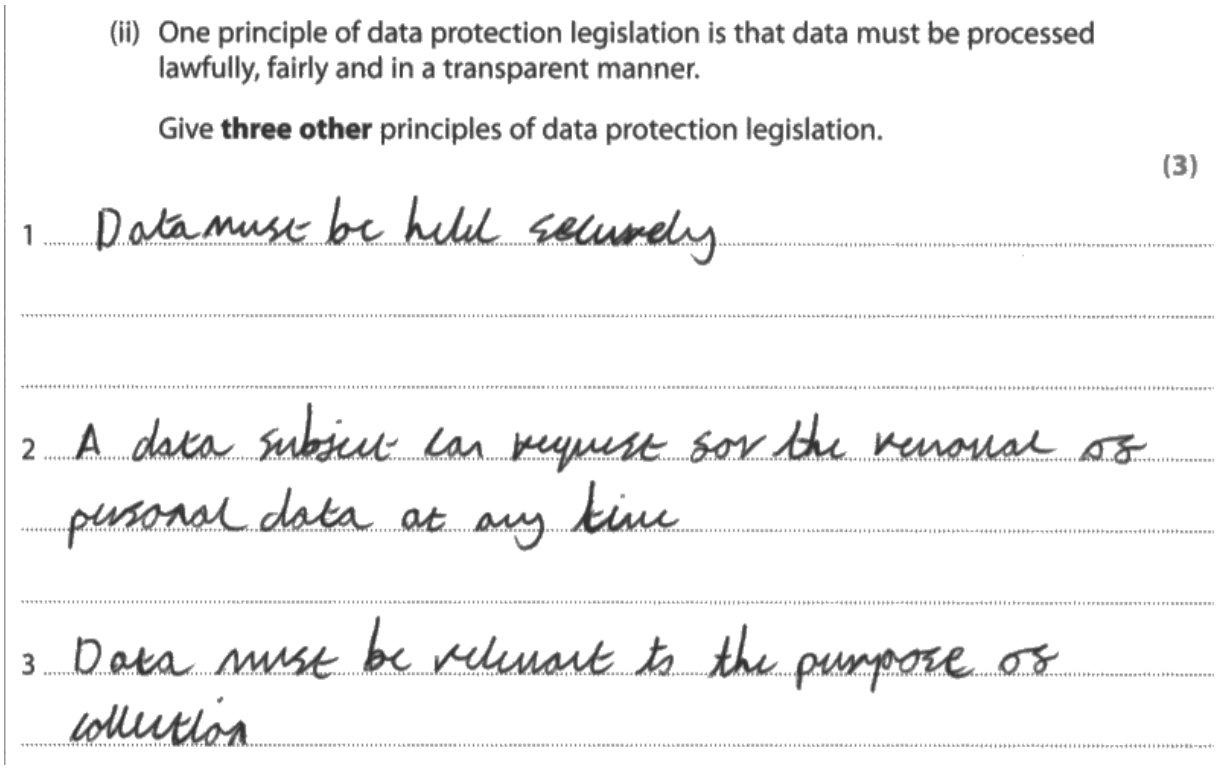
Grade boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

https://qualifications.pearson.com/en/support/support-topics/results-certification/grade-boundaries.html

Question 3(a)ii

Most candidates demonstrated at least some knowledge of the principles of data protection, either giving the responsibilities of companies holding and processing data or the rights of individuals. The most commonly cited data protection principle was the need to gain consent to collect data.



(ii) One principle of data protection legislation is that data must be processed lawfully, fairly and in a transparent manner.

Give **three other** principles of data protection legislation.

(3)

1 Data must be held securely

2 A data subject can request for the removal of personal data at any time

3 Data must be relevant to the purpose of collection

ResultsPlus
Examiner Comments

This response gained all 3 marks, covering both the rights of individuals and the responsibilities of companies.

Question 3(b)

A number of responses were too general to be awarded credit. Statements such as 'anyone can use it' or 'anyone can access it' could equally apply to free software where the source code is not made available. Good responses made it clear that it was the source code that could be accessed/edited.

(b) Software licensed as open-source can be used free of charge.

Give **one other** characteristic of open-source software licensing.



ResultsPlus
Examiner Comments

This response gained 0 marks because it was too vague. Anyone can use any software if they pay for it. Anyone can use 'free' software. It was not clear that the source code was freely available to anyone.

Question 3(c)i

Many candidates gave clear explanations using examples of recommended or banned actions that could appear in an AUP alongside resultant consequences and reasons. Some candidates confused acceptable usage policies with cyber security and the need for malware protection or confused it with access controls or monitoring programs. This showed a misunderstanding between policy to influence behaviour and automated technological systems to stop unwanted actions.

(c) Cyber security protects computer systems from harm.

(i) Explain **one** reason why an acceptable use policy keeps computer systems secure.

(2)

It prevents people with unauthorised access to misuse the systems to access data for personal use.

ResultsPlus Examiner Comments

This response scored 0 marks because it confused access controls with acceptable usage policies.