Examiners' Report
June 2022

GCSE Computer Science 1CP2 01

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June 2022

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Introduction

This is the first time that candidates have taken examinations for this paper, which requires them to demonstrate and apply knowledge and understanding of key principles and concepts outlined in the specification content.

This is an untiered paper that has been specifically designed to allow candidates of all ability ranges to find questions that are both challenging and interesting throughout.

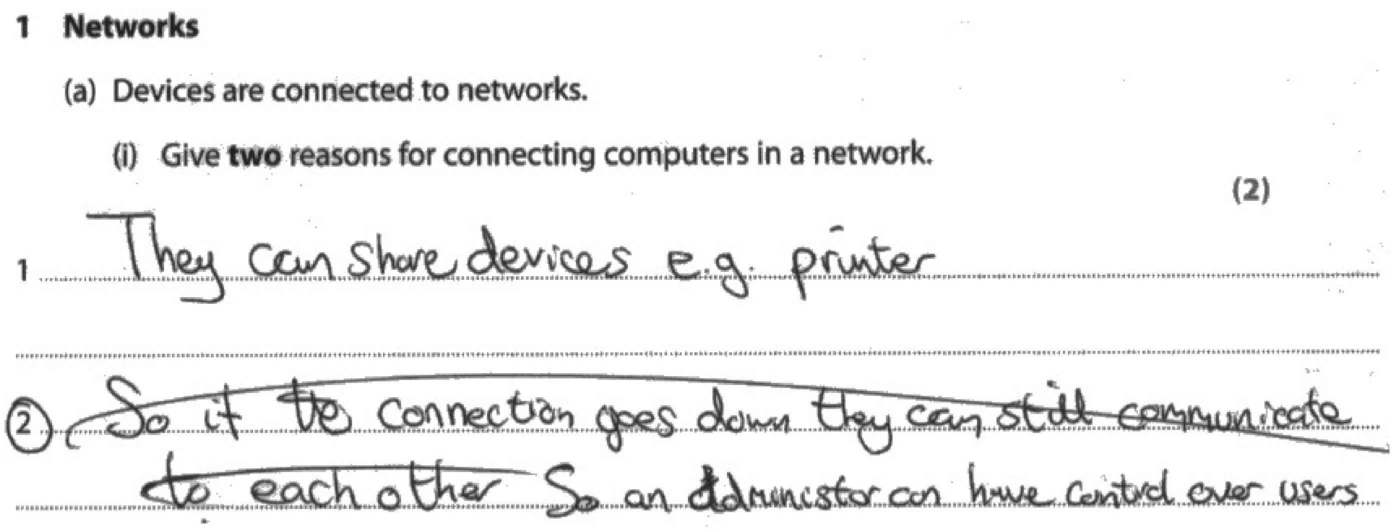
The paper consists of five questions (with sub-questions), with each question focussed on a different specification topic, rather than aspects of several different topics.

Candidates will find that 'command words' are used consistently in the paper to indicate the type of response expected. Candidates who achieved high marks often provided more detailed responses, including examples and reasons, where expansions or explanations were required.

Candidates should develop their use of subject-specific language and avoid giving generic responses, responding in the context of the question.

Question 1 (a)(i)

'Share data', 'communication' and 'share peripherals' were very frequent responses amongst candidates, who answered this question well.



1 Networks

(a) Devices are connected to networks.

(i) Give **two** reasons for connecting computers in a network.

(2)

1 They can share devices e.g. printer

② ~~So if the connection goes down they can still communicate to each other~~ So an administor can have control over users

ResultsPlus
Examiner Comments

'Share devices' gained the first mark.

The second mark was given for stating that an administrator can have control over users, as it implies 'central control'.

Total: 2 Marks

1 Networks

(a) Devices are connected to networks.

(i) Give **two** reasons for connecting computers in a network.

(2)

1 faster connection

2 Data is faster shared and saved easily.

ResultsPlus
Examiner Comments

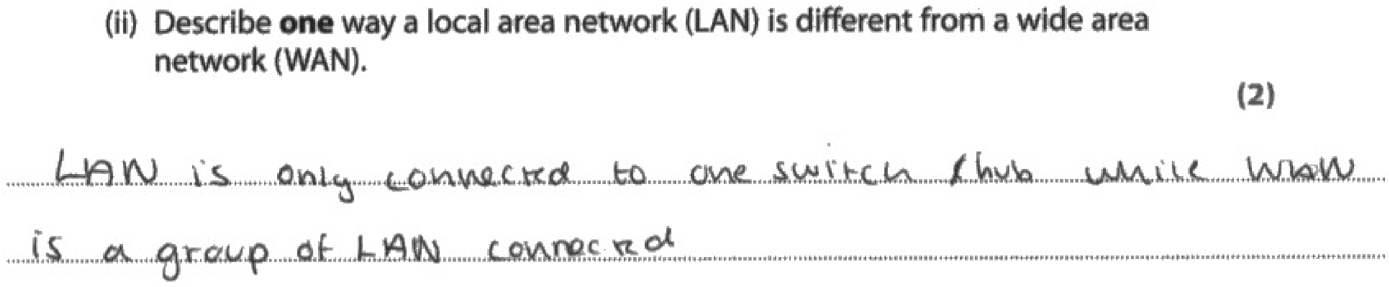
This response implies that data can be shared.

Total: 1 Mark

Question 1 (a)(ii)

Candidates showed an understanding that LANs cover a smaller area than WANs.

It was good to see candidates using network hardware terminology correctly, to differentiate in this question.



(ii) Describe **one** way a local area network (LAN) is different from a wide area network (WAN).

(2)

LAN is only connected to one switch / hub while WAN is a group of LAN connected

ResultsPlus
Examiner Comments

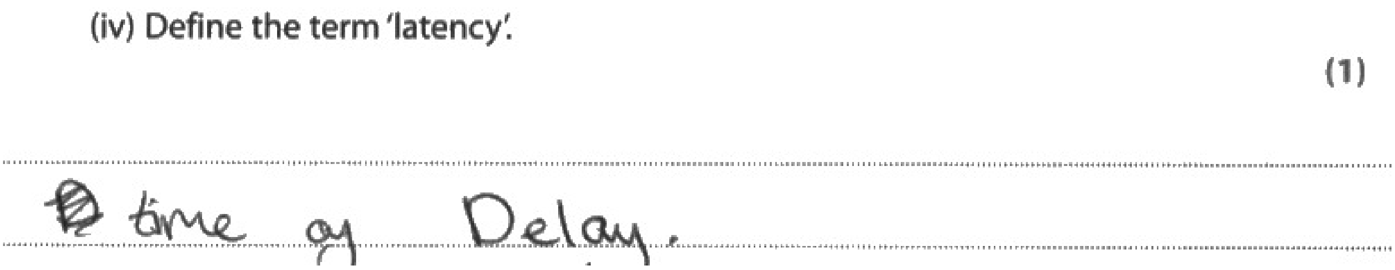
This candidate receives both marks.

Total: 2 Marks

Question 1 (a)(iv)

There was some understanding of the delay between sending and receiving data.

Some responses referred to it linking to a device or network and how dependable that was instead. Quite a few candidates described bandwidth, rather than latency.



(iv) Define the term 'latency'.

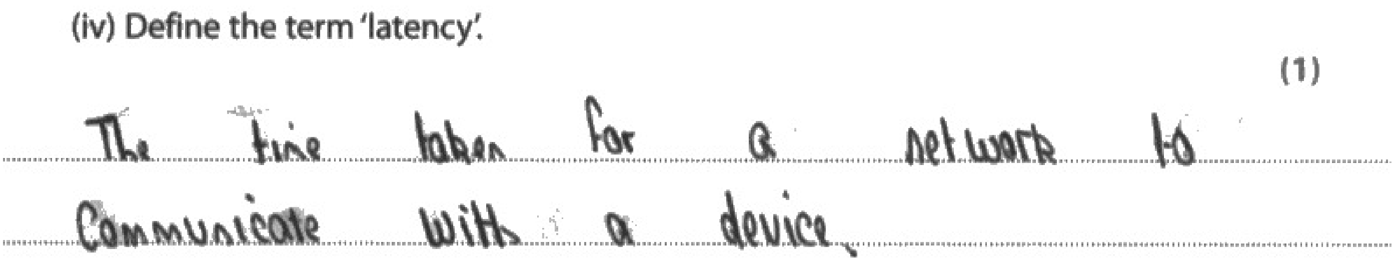
(1)

time of Delay.

ResultsPlus
Examiner Comments

There is not enough information here, to justify the mark.

Total: 0 Marks



(iv) Define the term 'latency'.

(1)

The time taken for a network to Communicate with a device.

ResultsPlus
Examiner Comments

This response implies that latency is the time taken for data to be sent (communication) between two devices (a single device called 'a device' and an abstraction of many devices called 'a network').

Total: 1 Mark

Question 1 (b)(i)

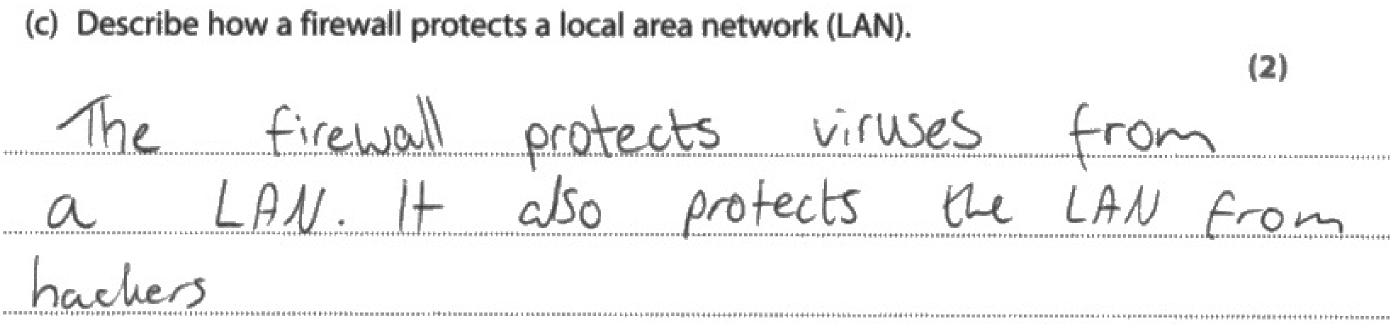
The majority of candidates gained the mark for this question.

Question 1 (c)

Candidates understood that a firewall monitors traffic, but there was a lack of expansion from this.

Candidates who said it followed a set of protocols/rules often expanded with ‘that defines whether the data is allowed into the network or not’.

A few candidates only referred to hacking.



(c) Describe how a firewall protects a local area network (LAN).

(2)

The firewall protects viruses from a LAN. It also protects the LAN from hackers

ResultsPlus
Examiner Comments

Some candidates gave general and inaccurate responses.

Total: 0 Marks

(c) Describe how a firewall protects a local area network (LAN).

(2)

Firewalls work as barriers against untrusted networks by monitoring ingoing and outgoing traffic. It also has reference to a set of security guidelines so it can detect and block hostile traffic.

ResultsPlus
Examiner Comments

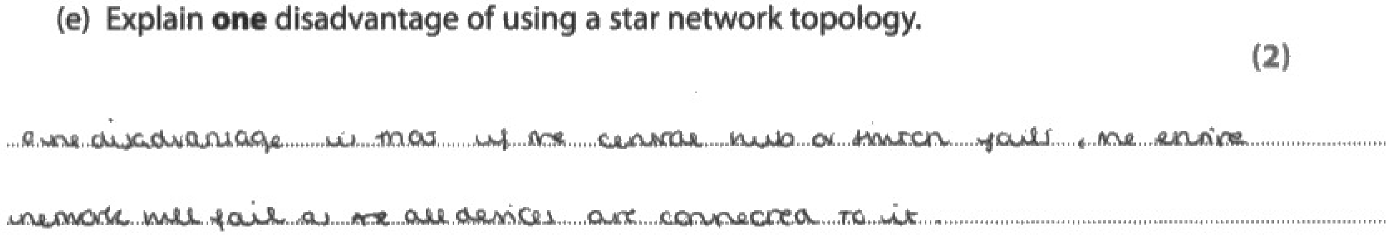
There was a number of responses where good levels of understanding were evident.

Total: 2 Marks

Question 1 (e)

A few candidates referred to the star network as having a server. Apart from this, the question was answered well.

The majority of candidates mentioned that if the central device/switch/hub failed, then those connected to it would too.



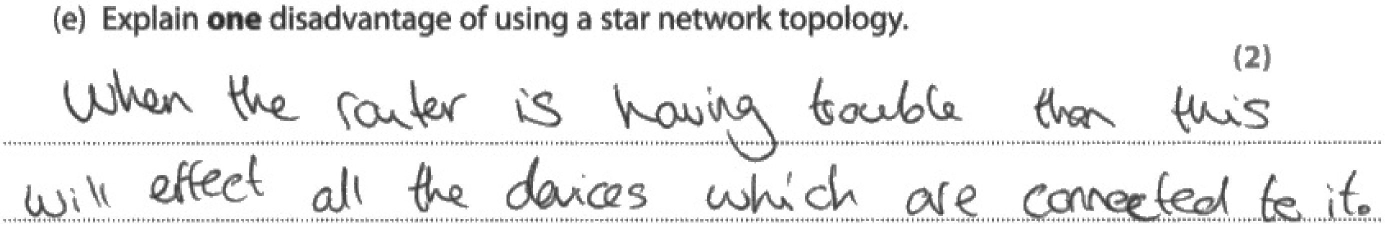
(e) Explain **one** disadvantage of using a star network topology.

(2)

one disadvantage is that if the central hub or switch fails, the entire network will fail as the all devices are connected to it.

A good response that gains both marks.

Total: 2 Marks



(e) Explain **one** disadvantage of using a star network topology.

(2)

When the router is having trouble than this will effect all the devices which are connected to it.

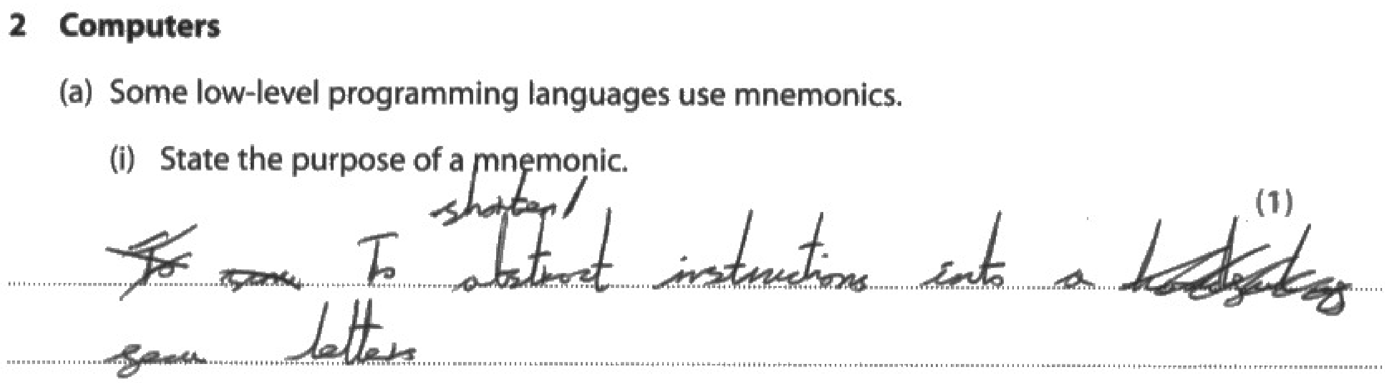
See additional guidance in the Mark Scheme.

The response implies that if the central device fails, all other devices will be affected (infer: negatively).

Total: 2 Marks

Question 2 (a)(i)

One common misconception was that low-level programming languages allow a computer to understand the code.



2 Computers

(a) Some low-level programming languages use mnemonics.

(i) State the purpose of a mnemonic.

(1)

~~To~~ ~~[illegible]~~ To shorten/ abstract instructions into a ~~[illegible]~~ few letters

ResultsPlus
Examiner Comments

This is an example of a response that gains the mark.

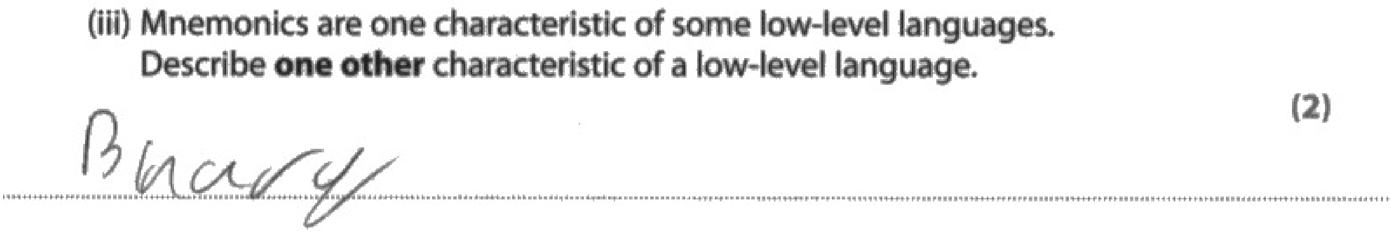
Total: 1 Mark

Question 2 (a)(ii)

Fewer than a quarter of candidates gained the mark for this question.

Question 2 (a)(iii)

Many responses to this question repeated the answer that was given to Q2(a)(i) and either did not appear to understand that this question was looking for different characteristics, or had not answered Q2(a)(i) correctly but put a correct description of a mnemonic here.



(iii) Mnemonics are one characteristic of some low-level languages.
Describe **one other** characteristic of a low-level language.

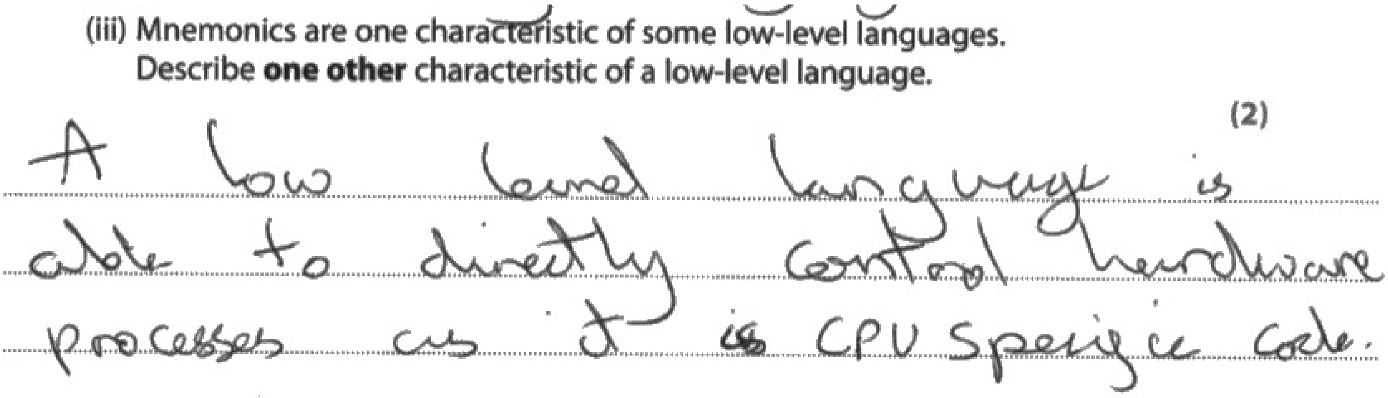
(2)

Binary

ResultsPlus
Examiner Comments

Machine code is written in binary. Binary is not a low-level language.

Total: 0 Marks



(iii) Mnemonics are one characteristic of some low-level languages.
Describe **one other** characteristic of a low-level language.

(2)

A low level language is able to directly control hardware processes as it is CPU specific code.

ResultsPlus
Examiner Comments

This response gains both marks from mark point 1.

Total: 2 Marks

Question 2 (a)(iv)

Almost half of the candidates gained the mark for this question.

Question 2 (b)

Almost half of the candidates did not gain a mark on this question, which is concerning, considering it is one of the fundamental definitions.

Question 2 (c)(i)

Again: almost half of the candidates did not gain a mark, with many referring to reading of the data rather than writing it.

Question 2 (c)(ii)

Rather more than half of the candidates gained the mark.

Question 2 (d)

Over three-quarters of the candidates did not gain the mark for this question.

Many candidates restated the question, by saying an embedded system has one specific purpose.

Question 2 (e)

The majority of candidates gained both marks.

Question 2 (f)

There were a few responses on types of errors: syntax and logic were mentioned quite frequently.

Over half of the candidates did not gain a mark, but there were some good responses related to security vulnerability and unvalidated 3rd party libraries.

Question 2 (g)

A number of candidates were of the opinion that the operating system granted permissions directly to the users.

Many candidates identified correctly that administrators can add and delete users, but then did not achieve the linked mark for 'so multiple people can use the same computer'.

Many candidates stated correctly that administrators can enforce permissions; quite often this came with stating that levels of read/write access for file resources could be enforced.

Quite a large number of candidates discussed enforcing user permissions, such as the type of access they would have to a file or installing programs.

Question 3 (a)(i)

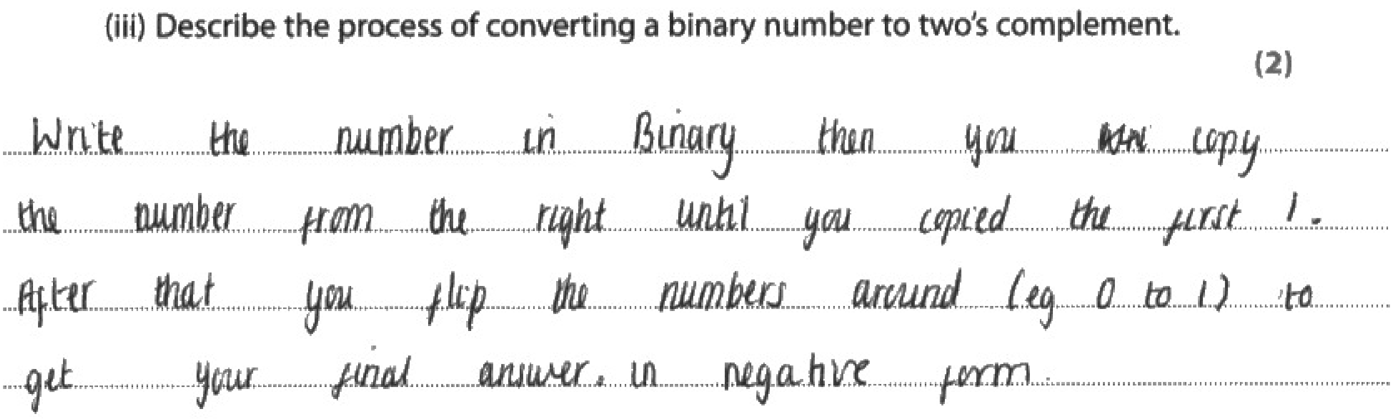
The majority of candidates gained both marks.

Question 3 (a)(ii)

Almost three-quarters of the candidates gained both marks.

Question 3 (a)(iii)

There was good understanding shown of the method to convert into two's complement.



(iii) Describe the process of converting a binary number to two's complement.

(2)

Write the number in Binary then you copy the number from the right until you copied the first 1. After that you flip the numbers around (eg 0 to 1) to get your final answer. in negative form.

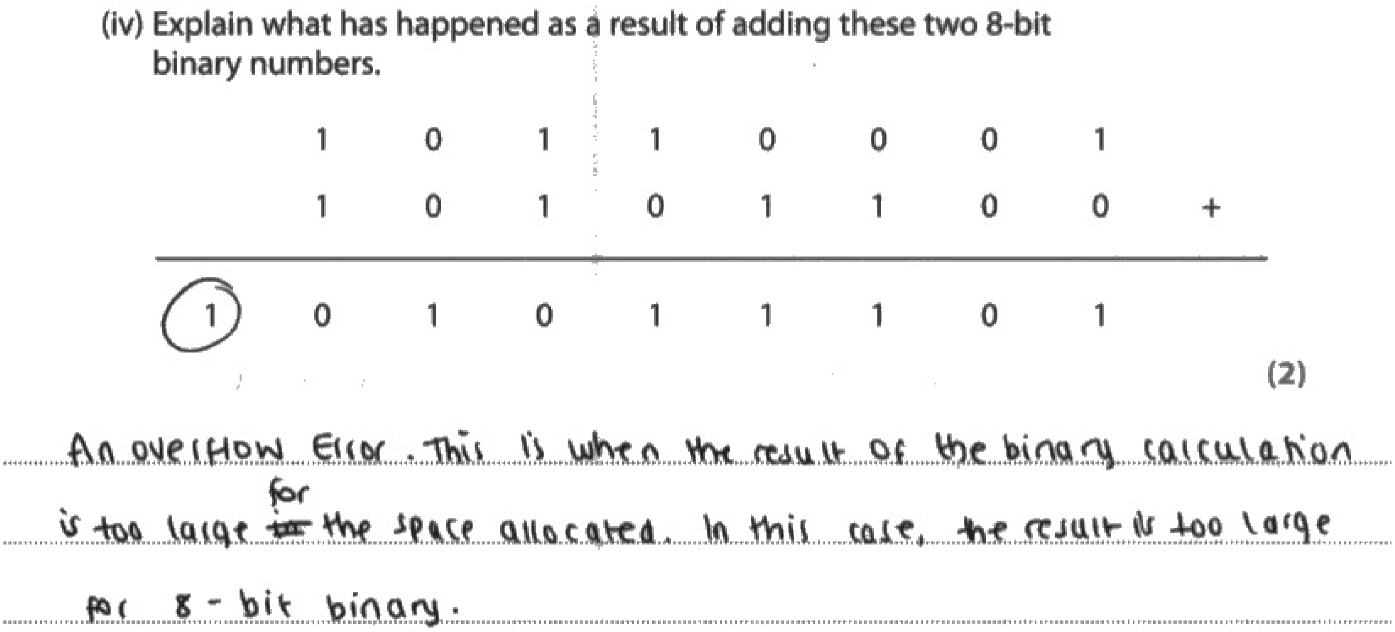
ResultsPlus
Examiner Comments

This response is worth 2 marks: copying all the numbers from the right and then flipping the remaining numbers.

Total: 2 Marks

Question 3 (a)(iv)

The most frequent response was overflow error. There was clear understanding from most candidates, here.



(iv) Explain what has happened as a result of adding these two 8-bit binary numbers.

	1	0	1	1	0	0	0	1	
	1	0	1	0	1	1	0	0	+
①	0	1	0	1	1	1	0	1	

(2)

An overflow Error. This is when the result of the binary calculation is too large ~~to~~ for the space allocated. In this case, the result is too large for 8-bit binary.

ResultsPlus
Examiner Comments

'overflow' gained a mark.

'The result of the calculation is too large' is too vague to award a mark for 'result more than 255' on its own.

However, the response then clarifies this with 'for the space allocated' – gaining the mark for 'not enough bits'

The response then goes on to state 'the result is too large for 8-bit binary'.

Total:2 Marks

(iv) Explain what has happened as a result of adding these two 8-bit binary numbers.

$$\begin{array}{cccccccccc} & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & \\ & 1 & 0 & 1 & 0 & 1 & 1 & 0 & 0 & + \\ \hline 1 & 0 & 1 & 0 & 1 & 1 & 1 & 0 & 1 & \end{array}$$

(2)

There is an additional one, this due to the adding binary rule of 1+1=1 carry a 1, which led to an additional 1 being carried and added.

ResultsPlus
Examiner Comments

This response is not accurate as related to this example.

It has to be 1+1=0 carry 1 because that is what has caused the overflow in THIS case.

Total: 0 Marks

Question 3 (b)

The majority of candidates gained the mark.

Question 3 (c)

Good answers saw almost half of the candidates gain full marks.

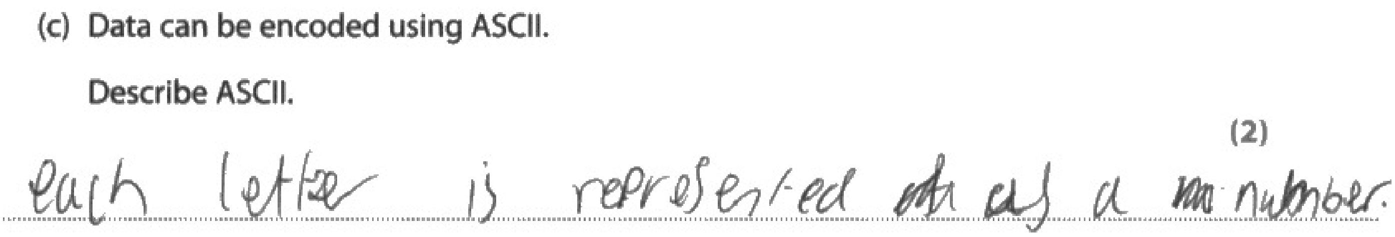
A few assumed ASCII was a programming language.

The most frequent responses were a character set, using 7 bit, 128 characters.

Some candidates gained the ‘standard’ mark for the full definition of American Standard Code for Information Interchange.

Many candidates correctly stated the ASCII allows for the representation of character.

However, it is notable that many candidates were incorrectly stating the nature of ASCII as conversion, or even encryption.



(c) Data can be encoded using ASCII.

Describe ASCII.

(2)

each letter is represented as a number.

ResultsPlus
Examiner Comments

There is enough information to imply that each character is mapped to a unique number but 'letters' is not enough to relate to 'text' in mark point 2.

If the response were 'each character is represented as a number' it would have been awarded two marks, because it shows the idea of mapping, and that it is a way of representing characters.

Total: 1 Mark

(c) Data can be encoded using ASCII.

Describe ASCII.

(2)

ASCII is a 7 bit computer language that contains ~~the number~~ 127 (0-126) different letters, numbers and symbols. But is only in American English, so does not work for languages that have a different alphabet.

ResultsPlus
Examiner Comments

Credit is only available for:

- 7-bits (1)

Containment is not the same as representation.

127 is not 128.

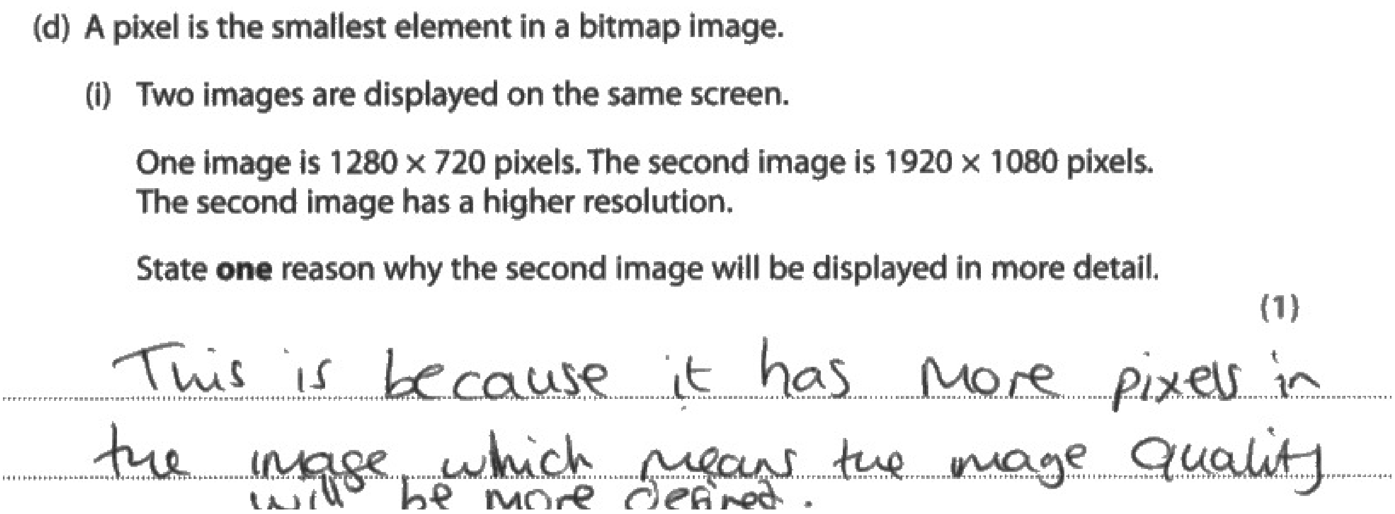
The rest of the response does not gain any marks.

Total: 1 Mark

Question 3 (d)(i)

The most common misconception was ‘more pixels’.

Many candidates responded with 'higher bit depth' or 'more quality'.



(d) A pixel is the smallest element in a bitmap image.

(i) Two images are displayed on the same screen.

One image is 1280 × 720 pixels. The second image is 1920 × 1080 pixels.
The second image has a higher resolution.

State **one** reason why the second image will be displayed in more detail.

(1)

This is because it has more pixels in the image which means the mage quality will be more defined.

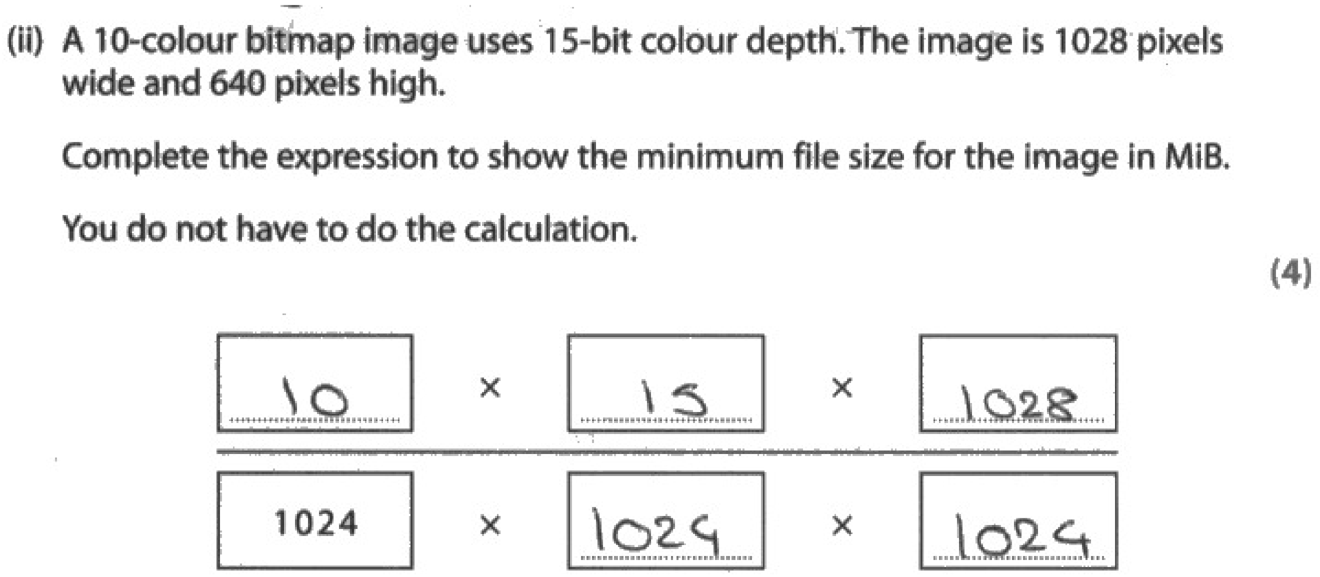
ResultsPlus
Examiner Comments

Not enough understanding is shown in this response.

Total: 0 Marks

Question 3 (d)(ii)

Almost half of the candidates gained all four marks.



(ii) A 10-colour bitmap image uses 15-bit colour depth. The image is 1028 pixels wide and 640 pixels high.

Complete the expression to show the minimum file size for the image in MiB.

You do not have to do the calculation.

(4)

$$\frac{\boxed{10}\times\boxed{15}\times\boxed{1028}}{\boxed{1024}\times\boxed{1024}\times\boxed{1024}}$$

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This response receives marks for:

- 15 in the numerator (1)
- 1024 x 1024 in the denominator (1)

Total: 2 Marks

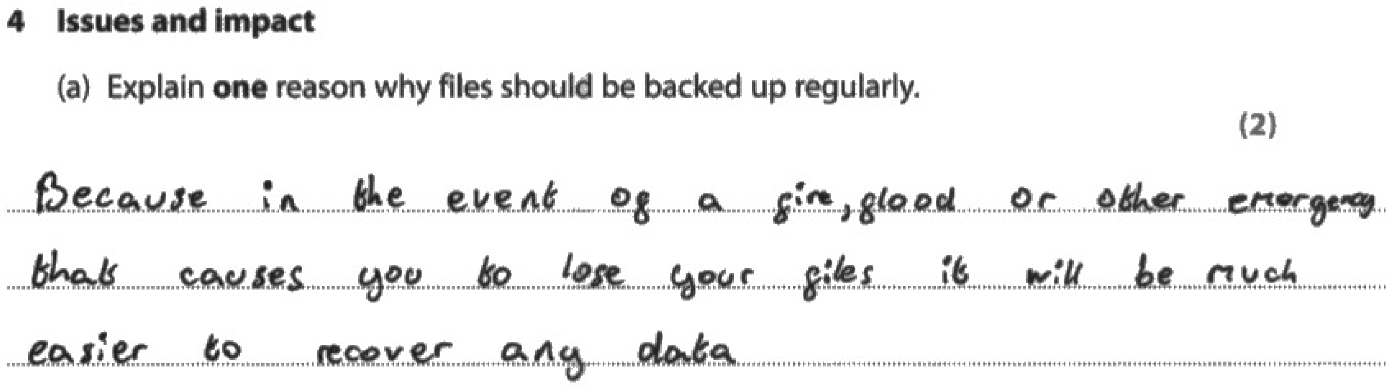
Question 4 (a)

The majority of candidates were able to explain why files should be backed up relating to:

- the risk of losing files
- preventing loss of data
- damaged or corrupted files

Many candidates explained the impact of restoring data.

Some candidates mentioned examples such as physical hazards and disruption to system failure.



4 Issues and impact

(a) Explain **one** reason why files should be backed up regularly.

(2)

Because in the event of a fire, flood or other emergency that causes you to lose your files it will be much easier to recover any data

ResultsPlus
Examiner Comments

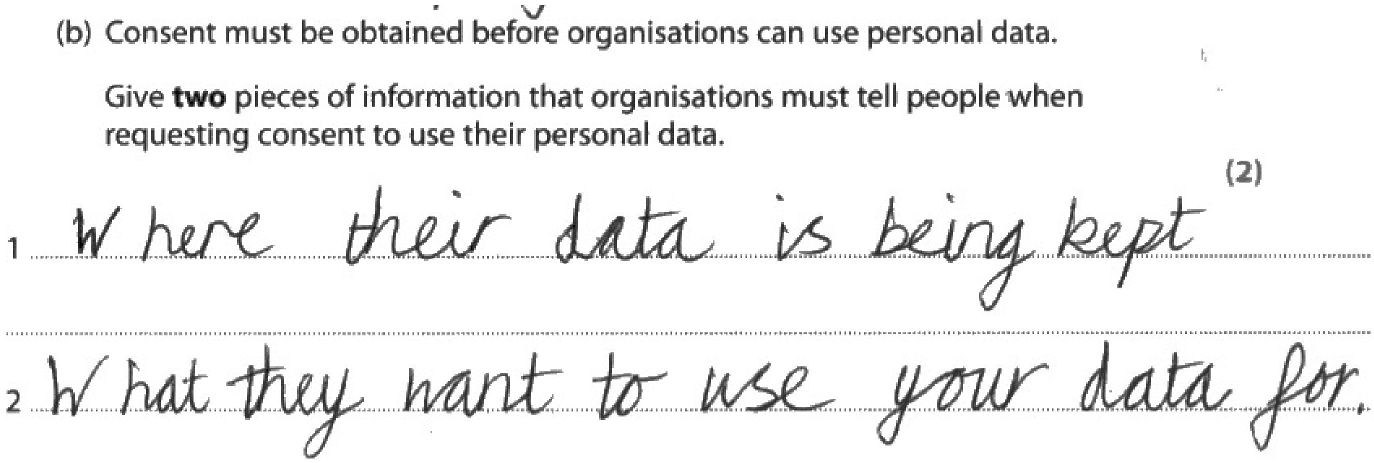
This is a typical example of a response that gained both marks.

Total: 2 Marks

Question 4 (b)

The most frequent response related to what the purpose of using the data will be.

Some responses mentioned that information should be provided if data could be shared with third parties.



(b) Consent must be obtained before organisations can use personal data.

Give **two** pieces of information that organisations must tell people when requesting consent to use their personal data.

(2)

1 Where their data is being kept

2 What they want to use your data for.

ResultsPlus
Examiner Comments

A frequent, incorrect, response was that people must be told where their data is being kept.

Total: 1 Mark

Question 4 (c)

The candidates were clearly aware of the topic.

A minority of candidates demonstrated depth of understanding. In particular, they showed a clear understanding of the role of biased data and subconscious bias of programmers. They understood that this could feed into the algorithms with the result in ethical bias and potential injustice that could manifest in the real world. Some responses focussed more on the obvious social impacts of biased policing with some good understanding that bias can cause an effect on deploying officers and discrimination.

Some candidates, who did not gain as many marks, referred to the system being related to hiring/choosing which police officers to employ for a job instead – missing how it could impact communities. There were a few candidates that made the assumption that ’algorithmic bias’ was a kind of software.

Question 5 (a)(i)

Two-thirds of candidates gained the mark for this question.

Question 5 (a)(ii)

Two-thirds of candidates gained the mark for this question.

Question 5 (a)(iii)

Two-thirds of candidates gained the mark for this question.

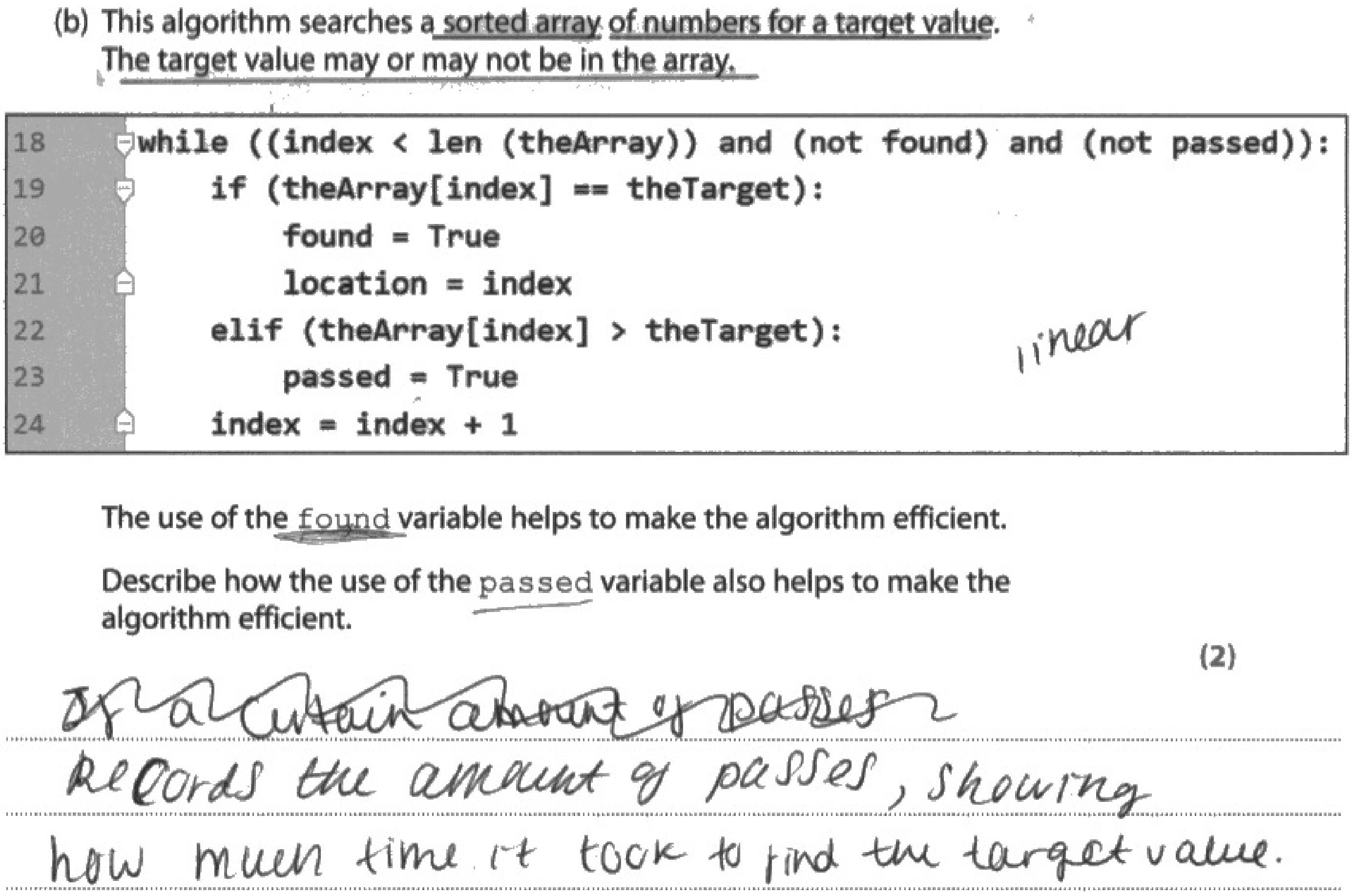
Question 5 (a)(iv)

Slightly more than half of candidates gained the mark for this question.

Question 5 (b)

Most candidates who gained a mark could state that the algorithm terminated due to the use of the passed variable.

Where marks were not awarded, candidates spent time discussing the found flag in place of the passed flag, repeated the question, and stated the target had been passed or simply reworded the algorithm.



(b) This algorithm searches a sorted array of numbers for a target value.
The target value may or may not be in the array.

```
while ((index < len (theArray)) and (not found) and (not passed)):
    if (theArray[index] == theTarget):
        found = True
        location = index
    elif (theArray[index] > theTarget):
        passed = True
    index = index + 1
```

linear

The use of the `found` variable helps to make the algorithm efficient.

Describe how the use of the `passed` variable also helps to make the algorithm efficient.

(2)

~~If a certain amount of passes~~
Records the amount of passes, showing how much time it took to find the target value.

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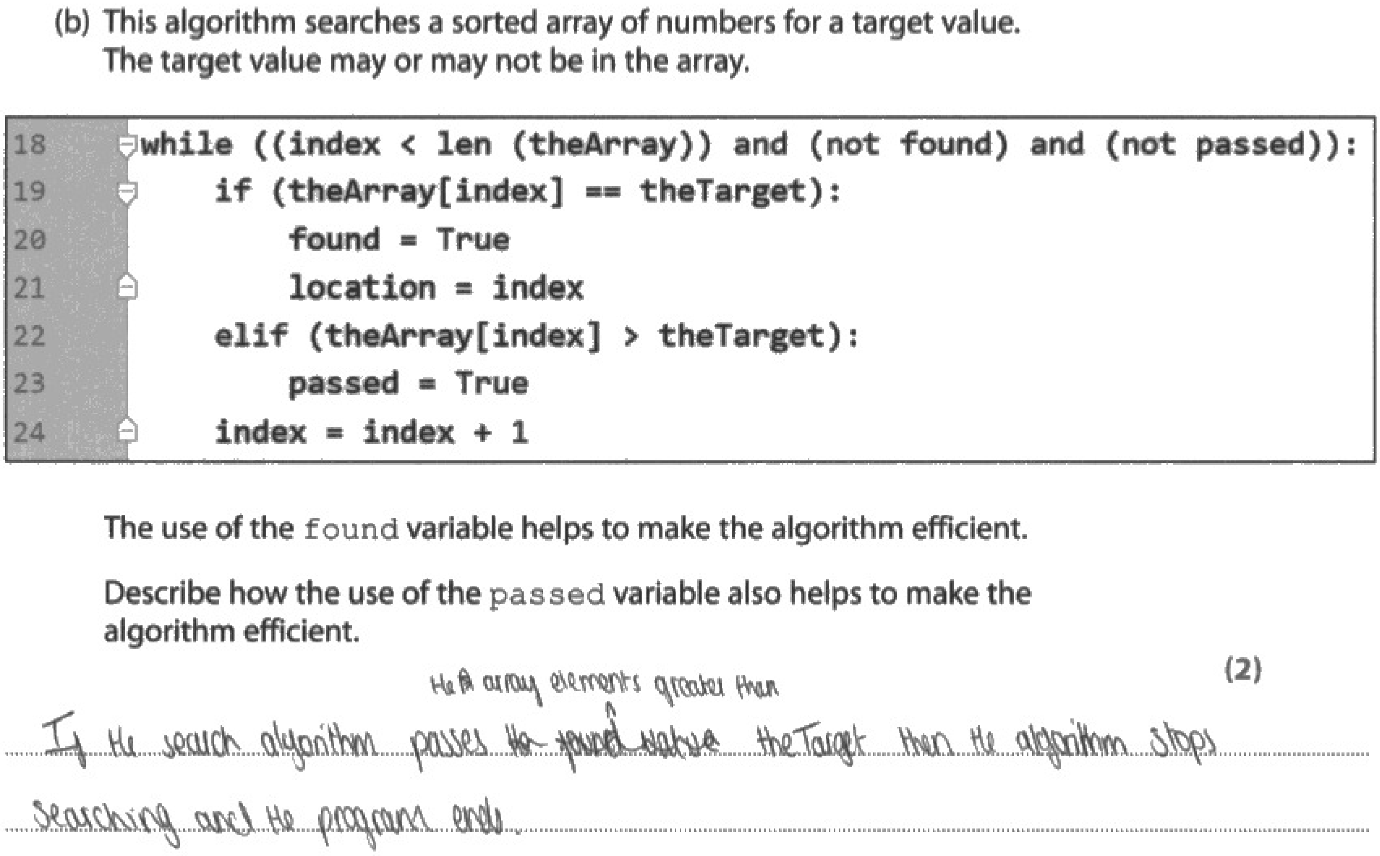
Examiner Comments

Some responses did not address the requirements of the question.

Total: 0 Marks



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while ((index < len (theArray)) and (not found) and (not passed)):
    if (theArray[index] == theTarget):
        found = True
        location = index
    elif (theArray[index] > theTarget):
        passed = True
    index = index + 1
```

The use of the `found` variable helps to make the algorithm efficient.

Describe how the use of the `passed` variable also helps to make the algorithm efficient.

(2)

the ~~a~~ array elements greater than

If the search algorithm passes ~~the found value~~ the Target then the algorithm stops searching and the program ends.

ResultsPlus
Examiner Comments

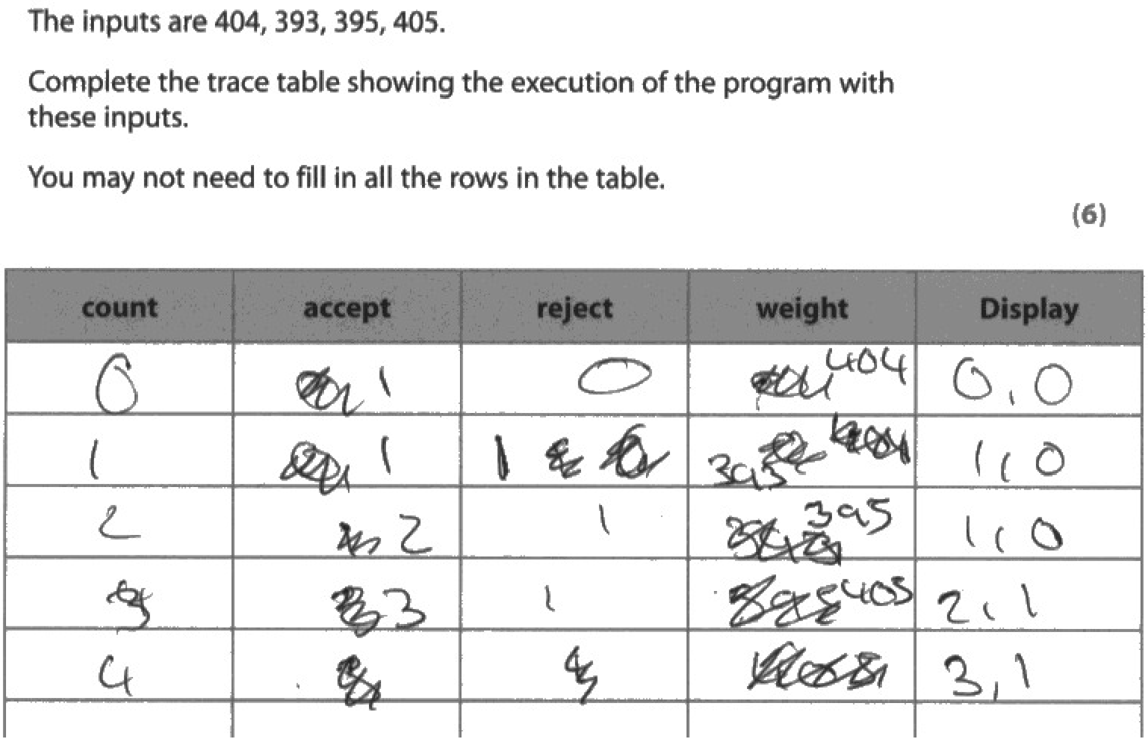
This is typical of responses that gained both marks.

Total: 2 Marks

Question 5 (c)

Many candidates were awarded the full six marks. Some lost a mark by not including the 0-count line.

There was a variety in the style and format of trace tables. It was common to see candidates writing in the display column with the accept, reject values or not using the count column.



The inputs are 404, 393, 395, 405.

Complete the trace table showing the execution of the program with these inputs.

You may not need to fill in all the rows in the table.

(6)

count	accept	reject	weight	Display
0	1	0	404	0, 0
1	1	1	395	1, 0
2	2	1	395	1, 0
3	3	1	405	2, 1
4	[illegible]	[illegible]	[illegible]	3, 1

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Examiner Comments

No 0 row (no MP1)

First given row: Count value is off by one (no MP2) (Display values are also present for all rows, which is incorrect)

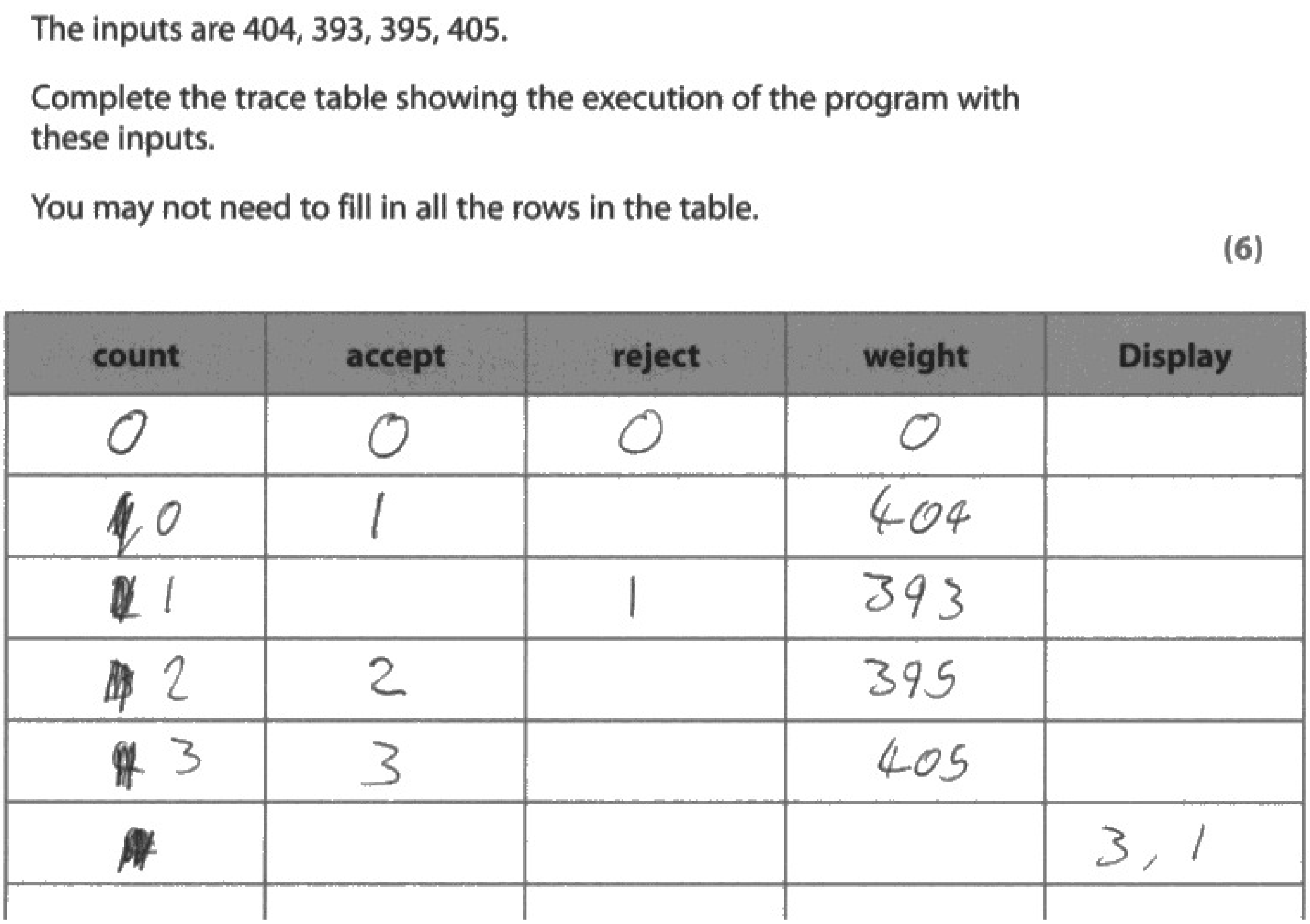
Second given row: follow through (FT) was applied on the count column, but reject should be 0 not 1 for MP3 (no MP3)(Display values are also present for all rows, which is incorrect)

Third given row: FT on count. Reject is correct... but accept value should be 1 (no MP4) (Display values are also present for all rows which is incorrect)

Fourth given row: FT on count, FT on accept, reject is still correct.... but weight is incorrect (no MP5)

Final given row: FT for count, FT for accept, reject still correct, weight correct Display column correct (awarded MP6)

Total: 1 Mark



The inputs are 404, 393, 395, 405.

Complete the trace table showing the execution of the program with these inputs.

You may not need to fill in all the rows in the table.

(6)

count	accept	reject	weight	Display
0	0	0	0	
0	1		404	
1		1	393	
2	2		395	
3	3		405	
				3, 1

ResultsPlus
Examiner Comments

All zeroes present. Awarded MP1 (1)

MP2 lost as count value is off by one (0)

The rest of the data is correct, aside from a repeated count error. Allow follow-through marks (third to sixth mark)

The comma was ignored in Display.

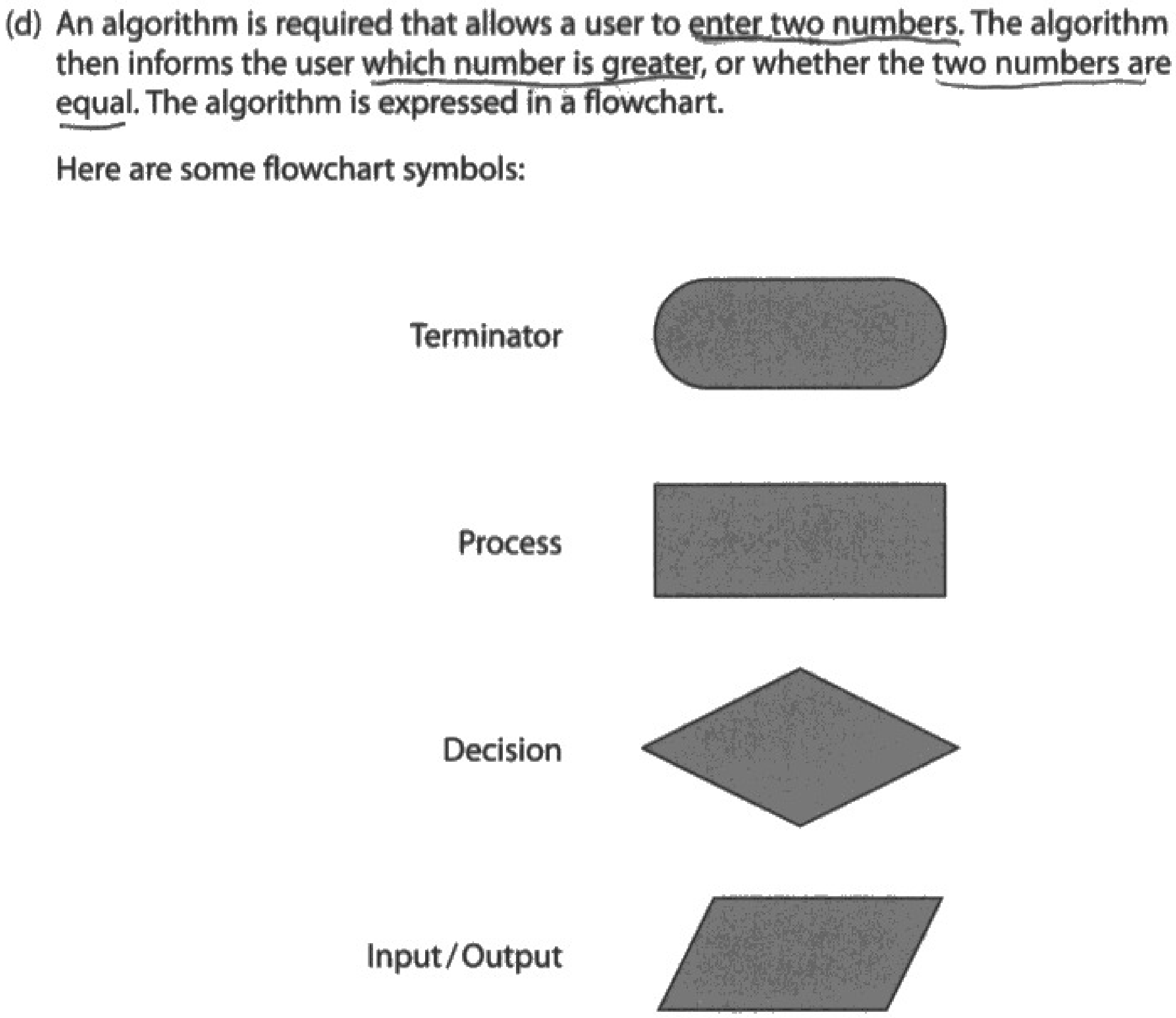
Total: 5 Marks

Question 5 (d)

Candidates receiving four marks or fewer usually did not use the correct symbol for all flow chart symbols.

The common misconceptions are using processes for decisions and input/outputs. Also, multiple terminators for the END, which outputs did not link to.

Those candidates achieving more than four marks could link the flow lines to the correct shape.



(d) An algorithm is required that allows a user to enter two numbers. The algorithm then informs the user which number is greater, or whether the two numbers are equal. The algorithm is expressed in a flowchart.

Here are some flowchart symbols:

Terminator

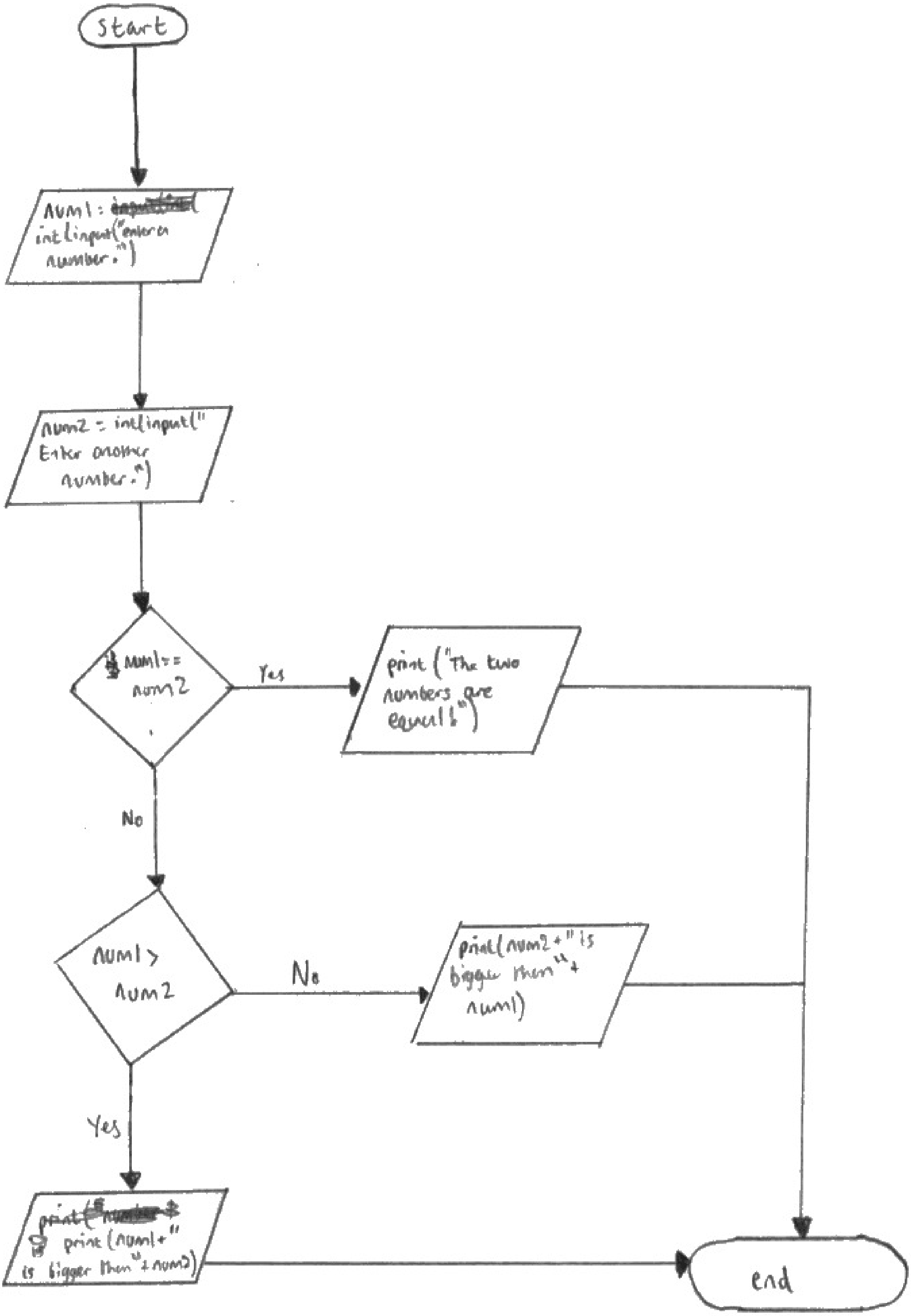
Process

Decision

Input/Output

Draw a flowchart to show this algorithm.

(6)



Start
num1 = int(input("enter a number.")
num2 = int(input("Enter another number.")
num1 == num2
Yes
print("The two numbers are equal!")
No
num1 > num2
No
print(num2 + " is bigger than " + num1)
Yes
print(num1 + " is bigger than " + num2)
end

ResultsPlus
Examiner Comments

A typical full-mark response.

Total: 6 Marks

Paper Summary

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

- Expanding and explaining answers using examples and reasons is required, especially where more than a simple statement or list is requested
- Where a context or scenario is provided, respond with the context of the question in mind
- Do not repeat responses when more than one example/reason is required
- Ensure responses match the requirements of the 'command' word
- Identify key words in the question to ensure that responses reflect the question that is asked

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

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