Examiners' Report
Principal Examiner Feedback

Summer 2023

Pearson Edexcel International Advanced Level
In Information Technology (WIT11) Paper 01
Unit 1

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Summer 2023
Publications Code WIT11_01_2306_ER

Introduction

This is the second full live series for this unit of the IAL IT. The first was in 2019 and the intervening years were disrupted due to Covid19.

Interpreting words used in the questions

The command taxonomy, available in the specification appendix 6, details the requirements for responses to both the command word explain and the command word describe. These command words are most often seen in questions worth two marks. The first mark is for a statement. The second mark is for a development of that statement (describe) or a justification of that statement (explain). The statement and the expansion must be linked and make sense together.

In the summer, responses were often seen for these questions that could only be awarded a single mark, as the development or justification was missing. The mark scheme for Q02d and Q06a demonstrates patterns for responses to an explain question that achieve both marks.

In some questions, the command word describe is used where the response is a description of a process. These questions may be worth more than two marks. Each mark is a step in the process.

The command word construct may be used to indicate that an arithmetic expression is required. In these cases, the question states that completion of the arithmetic is not required. Working out the numbers could, in fact, introduce errors. An expression showing how the calculation would be done can be awarded partial marks, where a worked-out answer cannot. The mark scheme for Q01d demonstrates examples of expressions that are awarded full marks. Should part of the expression be inaccurate, the remainder of the expression could still be awarded partial marks.

The words used in the questions should help students identify what is required in the response. There is a difference between characteristics (what something is), functionality (what it does), affordability (what it allows you to do), and its benefits or drawbacks (why you would/would not use it). Q04c asks for characteristics of cloud storage, i.e. what cloud storage is, rather than how to use it or what it lets you do.

Subject-specific terminology

Across all the questions, there was a tendency to omit the use of subject-specific terms or to confuse some words with others. Confusion with the terms shown in the table were seen in many responses.

Term	Observation
Cable	No modifier for fibre-optic or copper
Memory	Used to mean secondary storage
Process	Confused with file or application. Not often connected with running in the CPU, using memory or CPU cycles
Internet and Wi-Fi	Often used interchangeably, but they're not the same thing
Bandwidth	Confusion between bandwidth of a network (the maximum capacity available) and the bandwidth of a computing device (the maximum number of instructions possible per unit time)
Speed	Confusion between distance divided by time, as in science; the number of CPU cycles per time, as in devices; and the number of bits per second being transmitted right now, as in networking
Allocate <resources>	Not used often. General terms such as 'make sure a process has enough memory' should be avoided
Schedules CPU	Not used often. General terms such as 'decides how much of the CPU is given' should be avoided
Resources	There are many resources that the O/S controls access to, for processes, the most important are memory and CPU time.
Media	The physical structure over which network transmission takes place. This was often confused with protocol.
Protocol	The rules of communication between devices and over a network. This was often confused with media.

Q01a(i)

A majority of students were awarded a mark for this question.

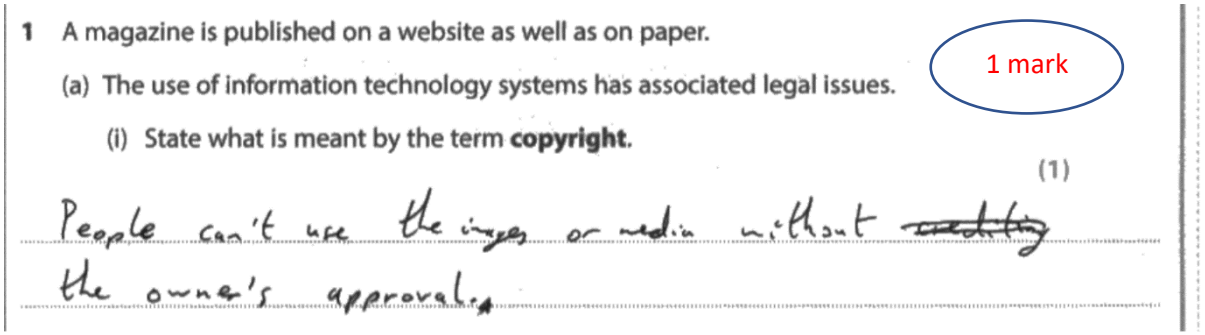
The format of this question requires a response that is a definition. The term to define is emboldened. In this case, it is **copyright**.

Many responses expressed the idea of ownership.

Responses were seen that included ways to avoid breaking copyright, but that is not required by the question.

Some students confuse copyright with ways to prevent copyright laws being broken, such as attribution or referencing.

There were some responses that indicated that copyright prevented artefacts from being copied. These could not be awarded a mark, as copyright cannot prevent the copying of artefacts; it just makes the copying illegal.



1 A magazine is published on a website as well as on paper.

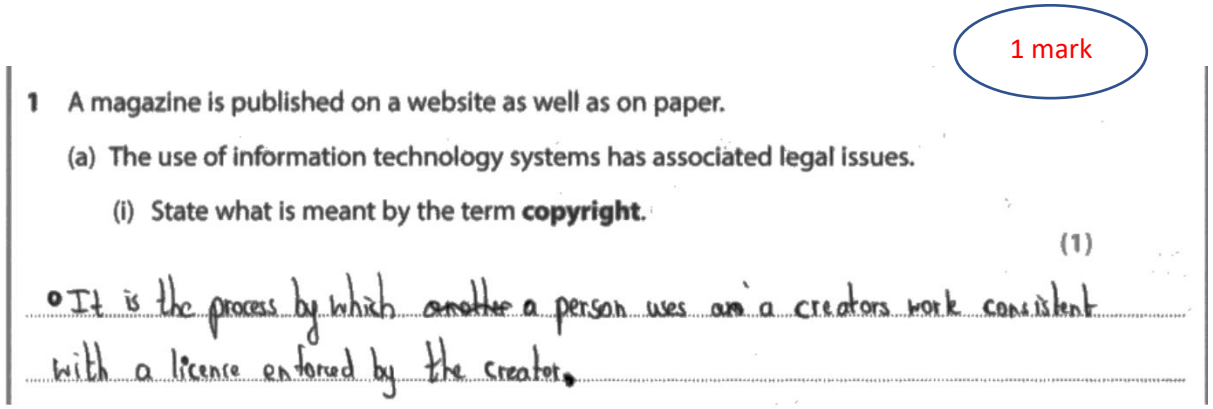
(a) The use of information technology systems has associated legal issues.

(i) State what is meant by the term **copyright**.

(1)

People can't use the images or media without ~~creating~~ the owner's approval.

1 mark



1 A magazine is published on a website as well as on paper.

(a) The use of information technology systems has associated legal issues.

(i) State what is meant by the term **copyright**.

(1)

It is the process by which ~~another~~ a person uses one a creators work consistent with a licence enforced by the creator.

1 mark

1 A magazine is published on a website as well as on paper.

(a) The use of information technology systems has associated legal issues.

(i) State what is meant by the term **copyright**.

(1)

1 mark

A legal right of the owner of the content to sue anyone who breaks the agreement

1 A magazine is published on a website as well as on paper.

(a) The use of information technology systems has associated legal issues.

(i) State what is meant by the term **copyright**.

(1)

0 mark

Copyright is when one company is copying an intellectual property or another.

1 A magazine is published on a website as well as on paper.

(a) The use of information technology systems has associated legal issues.

(i) State what is meant by the term **copyright**.

(1)

0 mark

A law that prevents one's work from being copied if he has copyrighted it

Q01a(ii)

This question was very well answered.

This question requires application of knowledge to a context, given in the first column. A wide range of responses were acceptable for the three missing cells.

The term plagiarism was seen in some response. While it is unethical, it is not a legal issue, as the use may be with or without consent of the copyright holder.

(ii) Complete the table to name the legal issue associated with **each** situation.

(3)

Situation	Legal issue
A member of staff uses the magazine editor's password to access the editor's emails	unauthorized access
The individual responses of readers from a 1983 survey are stored in a warehouse	phishing
The new magazine logo is found online and copied by another organisation	fraud.

1 mark

(ii) Complete the table to name the legal issue associated with **each** situation.

(3)

Situation	Legal issue
A member of staff uses the magazine editor's password to access the editor's emails	Account theft.
The individual responses of readers from a 1983 survey are stored in a warehouse	irrelevant data storage. Violation of data protection act.
The new magazine logo is found online and copied by another organisation	Plagarism

1 mark

(ii) Complete the table to name the legal issue associated with **each** situation.

(3)

Situation	Legal issue
A member of staff uses the magazine editor's password to access the editor's emails	Unauthorized Access
The individual responses of readers from a 1983 survey are stored in a warehouse	Data collection law / Data protection law
The new magazine logo is found online and copied by another organisation	~~Breaking~~ Violating Copyright laws / Creative Commons

3 marks

Q01b(i)

This question requires students to state one reason encryption is secure. The key to this question is addressing why it is secure, with a technically accurate reason, rather than how it is made secure.

Any transmission across a network can be intercepted or accessed, even encrypted transmissions. If that transmission is intercepted then it can be read, as in viewed.

However, should a transmission be intercepted, it can not be understood or made sense of without the use of a decryption key.

Therefore, the reason it is secure, is not that it cannot be accessed, but that it makes no sense to whomever is looking at it.

Some responses did not use subject-specific terminology, such as key.

(b) Customers use a web browser to read the magazine and also to manage their accounts.

(i) State **one** reason why the use of encryption makes data more secure.

(1)

As other users can't ~~see~~ read the data

0 mark

(b) Customers use a web browser to read the magazine and also to manage their accounts.

(i) State **one** reason why the use of encryption makes data more secure.

(1)

1 mark

Encryption makes data more secure because they encrypt the data without the key it cannot be opened.

(b) Customers use a web browser to read the magazine and also to manage their accounts.

(i) State **one** reason why the use of encryption makes data more secure.

(1)

0 mark

This is because it uses a secret code that may be only accessible to a limited no. of users.

Q01b(ii)

This was well answered, with a majority of responses awarded the mark.

Q01c(i)

This question was not well answered, with few responses awarded one or both marks.

This question specifically asks for two tasks that can be done with client-side scripting, not what is meant by the term client-side scripting.

Many responses indicated that client-side scripting ran in the client's browser. There were a significant number of responses that indicated client-side scripting is used to create/view/load static web pages. A common response was to display/show the web page. There were a few vague responses about carrying out user's requests or updating the page to fit the user's preferences.

The most commonly awarded mark was for a response that indicated client-side scripting was used to provide interactivity or run videos on a web page.

(c) Web pages use both client-side and server-side scripting.

(i) State **two** tasks carried out by client-side scripting.

1 mark

(2)

1 Client side scripting returns a database to the user to find his results, it runs on the webbrowser.

2 Client side uses HTML, CSS, Javascript, its a static webpage and does not change per user's needs.

(c) Web pages use both client-side and server-side scripting.

(i) State **two** tasks carried out by client-side scripting.

1 mark

(2)

1 It loads web ~~browsers~~ pages from the server on client's computer

2 It allows ~~into~~ interactivity between clients and webpages

(c) Web pages use both client-side and server-side scripting.

(i) State **two** tasks carried out by client-side scripting.

2 marks

(2)

1 Validate forms.

2 Add functionality to the webpage using JavaScript.

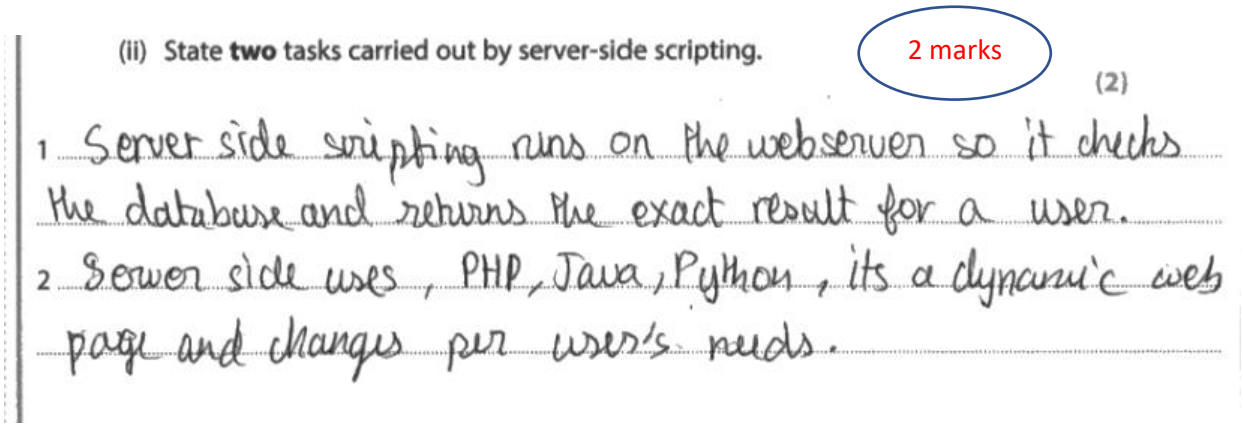
Q01c(ii)

This question was not well answered, with few responses awarded one or both marks.

This question specifically asks for two tasks that can be done with server-side scripting, not what is meant by the term server-side scripting.

Many responses indicated that server-side scripting ran in the server, reducing the load on the client machine.

The most commonly awarded mark was for creating dynamic web pages.

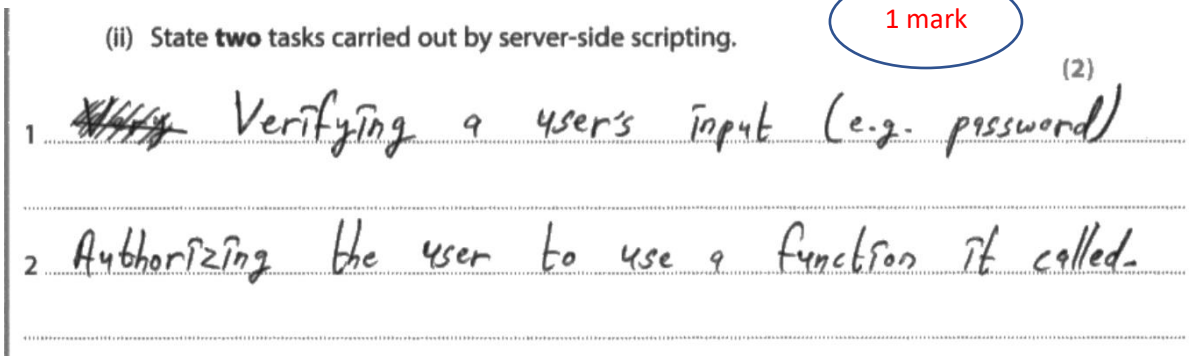


(ii) State **two** tasks carried out by server-side scripting. (2)

2 marks

1 Server side scripting runs on the webserver so it checks the database and returns the exact result for a user.

2 Sewer side uses, PHP, Java, Python, its a dynamic web page and changes per user's needs.

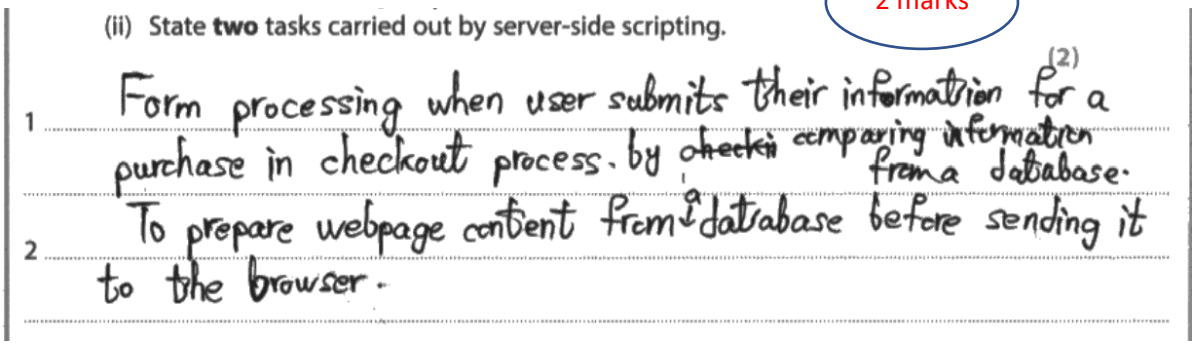


(ii) State **two** tasks carried out by server-side scripting. (2)

1 mark

1 ~~Verifying~~ Verifying a user's input (e.g. password)

2 Authorizing the user to use a function it called.



(ii) State **two** tasks carried out by server-side scripting. (2)

2 marks

1 Form processing when user submits their information for a purchase in checkout process. by ~~check~~ comparing information from a database.

2 To prepare webpage content from a database before sending it to the browser.

Q01d

Responses to this question achieved a range of marks. The majority of responses were award one or two of the available marks.

This question requires substituting the numbers from the question into a given formula and using conversion units to derive a file size.

The use of conversion units presented a challenge for many students.

Some responses carried out part of or the whole of the calculation. The question states that completion of the arithmetic is not required. Working out the numbers could, in fact, introduce errors. An expression showing how the calculation would be done can be awarded partial marks, where a worked-out answer cannot.

Construct an expression to show how big the video is in gibibytes.

You do **not** need to do the calculation.

(4)

2 marks

File size in bits = $7 \times 60 \times 50.4 \times 8 \times 1024 \times 1024 \times 1024$

$420 \text{ secs} \times 50.4 \times 8 \times 1024 \times 1024 \times 1024$

Construct an expression to show how big the video is in gibibytes.

You do **not** need to do the calculation.

2 marks

(4)

$50.4 \times 1000 \times 1000 = \frac{\text{size}}{7 \times 60}$

$\text{size} = 50.4 \times 1000 \times 1000 \times 7 \times 60$

Construct an expression to show how big the video is in gibibytes.

You do **not** need to do the calculation.

1,000,000 = 1,000²

(4)

1 byte → 8 bits

7 min = 7 × 60 sec

File size = 8 × 1024 × 1024 × 1024

3 marks

File size in gibibytes = $\frac{(7 \times 60) + (50.4 \times 1024)}{8 \times 1024 \times 1024 \times 1024}$

Construct an expression to show how big the video is in gibibytes.

You do **not** need to do the calculation.

(4)

4 marks

File size in bits = ~~$\frac{((7 \times 60) \times (50.4 \times 1000 \times 1000))}{(1000 \times 1000 \times 1000 \times 8)}$~~

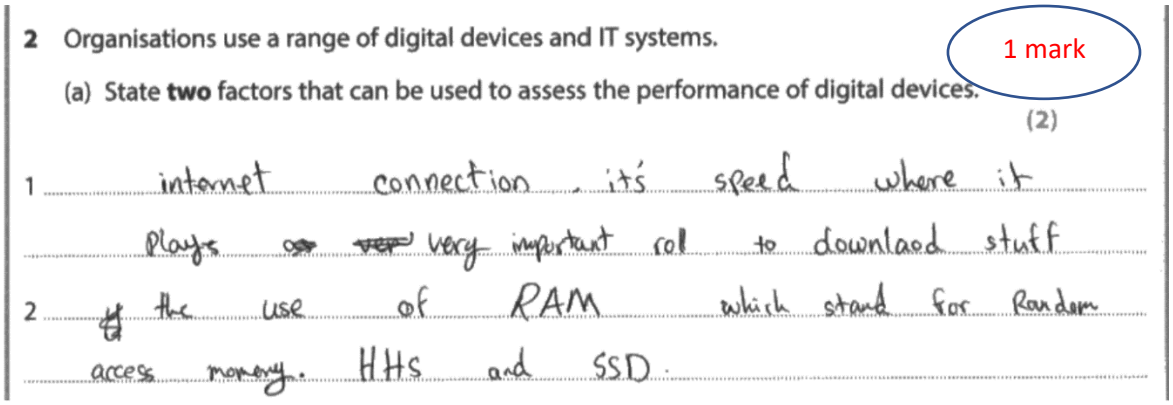
File size in bits = $\frac{((7 \times 60) \times (50.4 \times 1000 \times 1000))}{(1024 \times 1024 \times 1024 \times 8)}$

Q02a

This question was well answered, with a large majority of responses achieving marks.

This question asks for two factors on which to judge the performance of a device.

Where responses did not receive a mark, it was usually because they attempted to describe how to actually run a test to determine the performance of a device.



2 Organisations use a range of digital devices and IT systems.

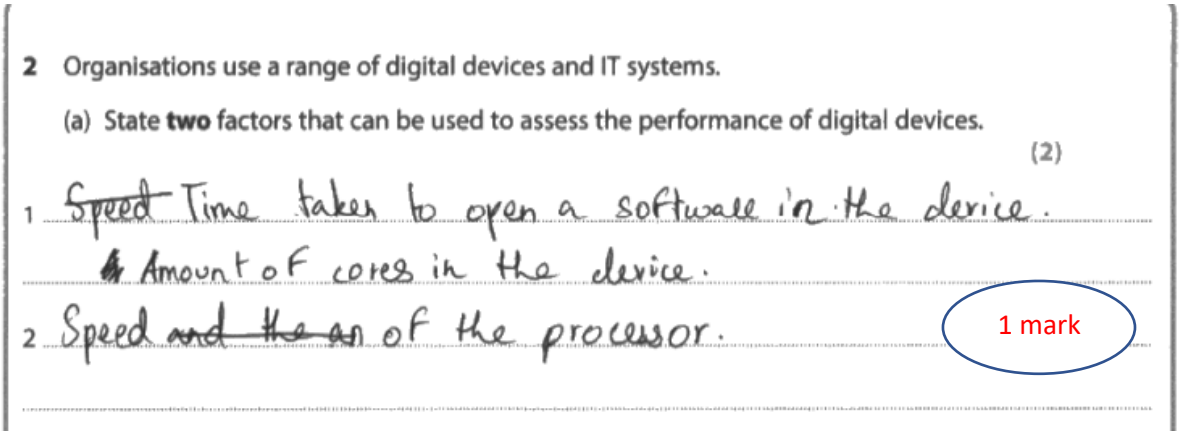
(a) State **two** factors that can be used to assess the performance of digital devices.

(2)

1 internet connection . it's speed where it plays ~~an~~ very important rol to download stuff

2 ~~if~~ the use of RAM which stand for Random access ~~memory~~. HHs and SSD.

1 mark



2 Organisations use a range of digital devices and IT systems.

(a) State **two** factors that can be used to assess the performance of digital devices.

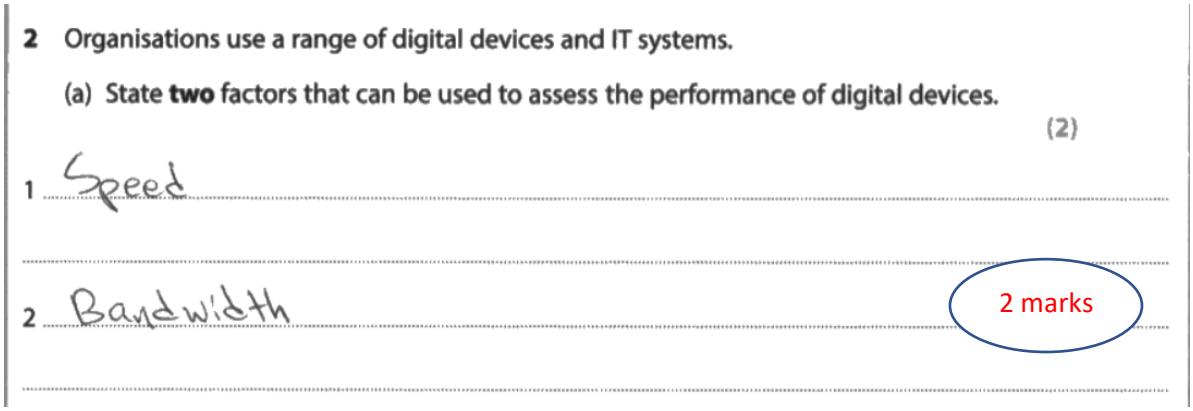
(2)

1 ~~Speed~~ Time taken to open a software in the device.

~~4~~ Amount of cores in the device.

2 Speed ~~and the an~~ of the processor.

1 mark



2 Organisations use a range of digital devices and IT systems.

(a) State **two** factors that can be used to assess the performance of digital devices.

(2)

1 Speed

2 Bandwidth

2 marks

2 Organisations use a range of digital devices and IT systems.

0 mark

(a) State **two** factors that can be used to assess the performance of digital devices.

(2)

1 Internet speed tests

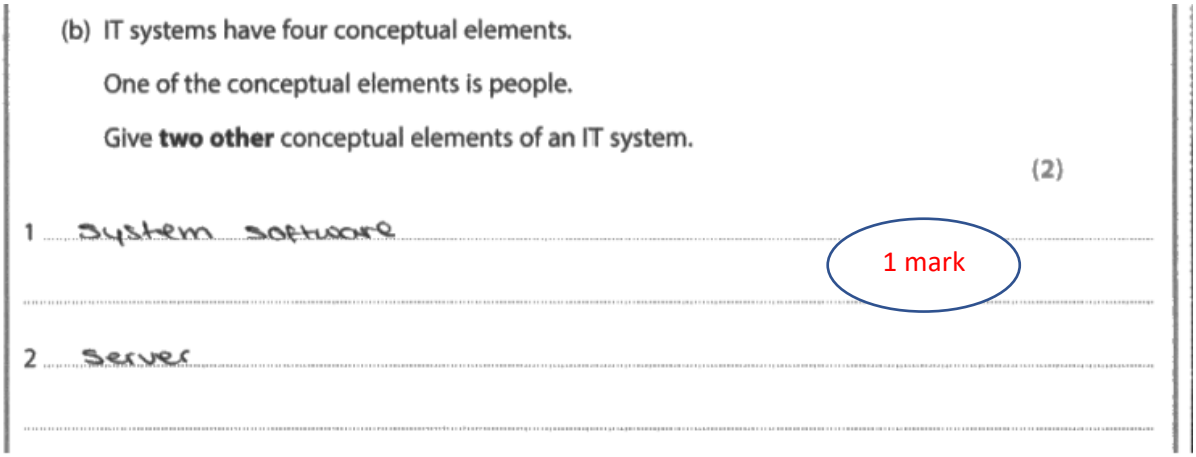
2 Uploading files and seeing how fast they upload speed

Q02b

A majority of responses was award one or both marks.

This question asks for two of the remaining concepts of an IT system. The first, people, is given in the question.

Where responses did not earn a mark, it was commonly due to the inability to distinguish whether the provided answer was hardware, software, or processes.



(b) IT systems have four conceptual elements.

One of the conceptual elements is people.

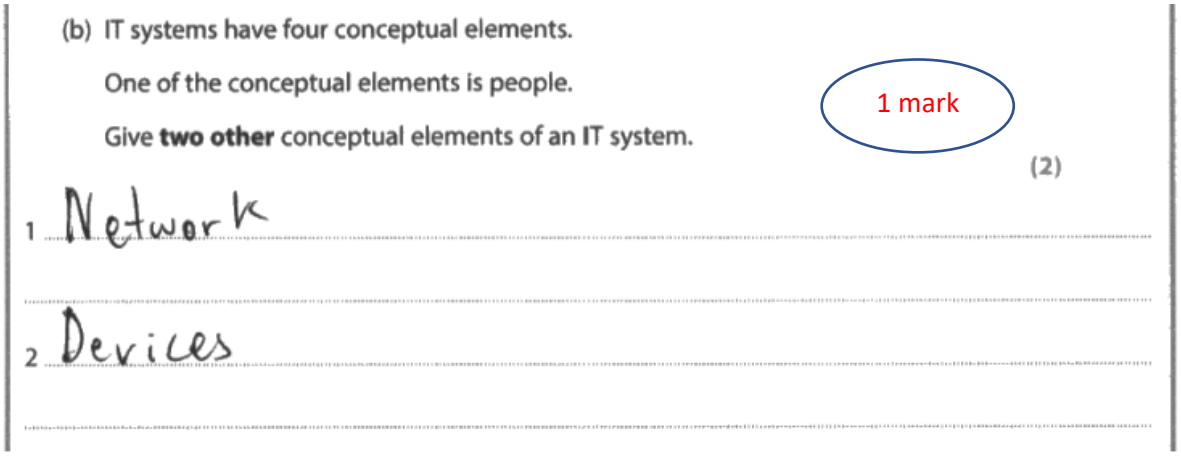
Give **two other** conceptual elements of an IT system.

(2)

1 System software

2 Server

1 mark



(b) IT systems have four conceptual elements.

One of the conceptual elements is people.

Give **two other** conceptual elements of an IT system.

(2)

1 Network

2 Devices

1 mark

(b) IT systems have four conceptual elements.

One of the conceptual elements is people.

Give **two other** conceptual elements of an IT system.

2 marks

(2)

1 hardware.

2 software.

(b) IT systems have four conceptual elements.

One of the conceptual elements is people.

Give **two other** conceptual elements of an IT system.

1 mark

(2)

1 Data stored

2 Processes carried out.

Q02ci

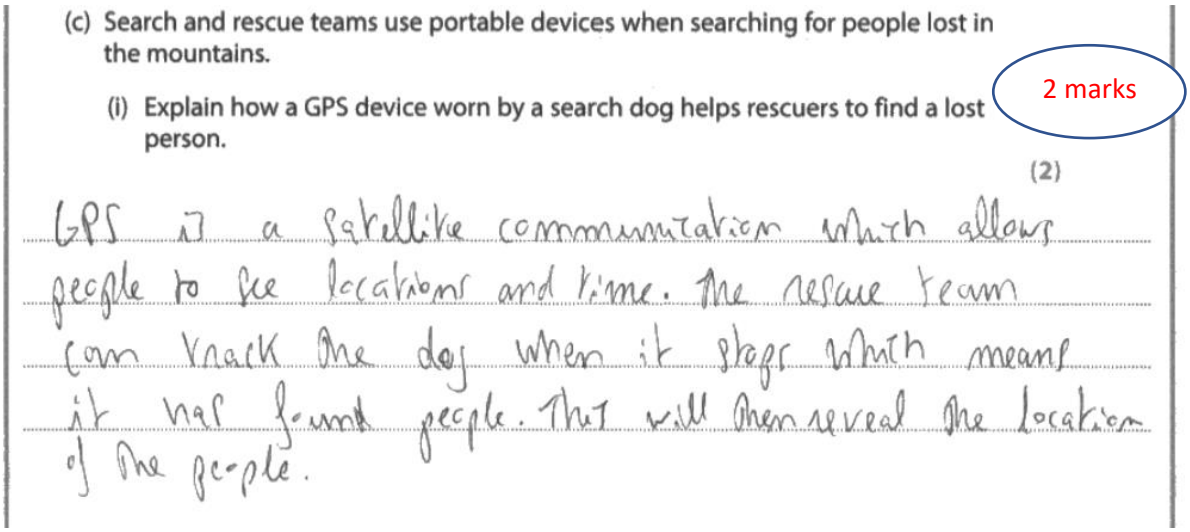
This question was well answered, with about half the responses awarded both marks.

This is an explain question for two marks. It requires a statement, followed by a justification. The context is a dog, wearing a GPS device, helping rescuers to find a lost person in the mountains.

There are no marks in this question for explaining how GPS works. Examiners did see many of those.

There were many creative responses that indicated tracking the dog (one mark) to the person's location (one mark). However, there were many different expressions that could achieve both marks.

Responses that indicated that the GPS device was held by the lost person could not be awarded marks.



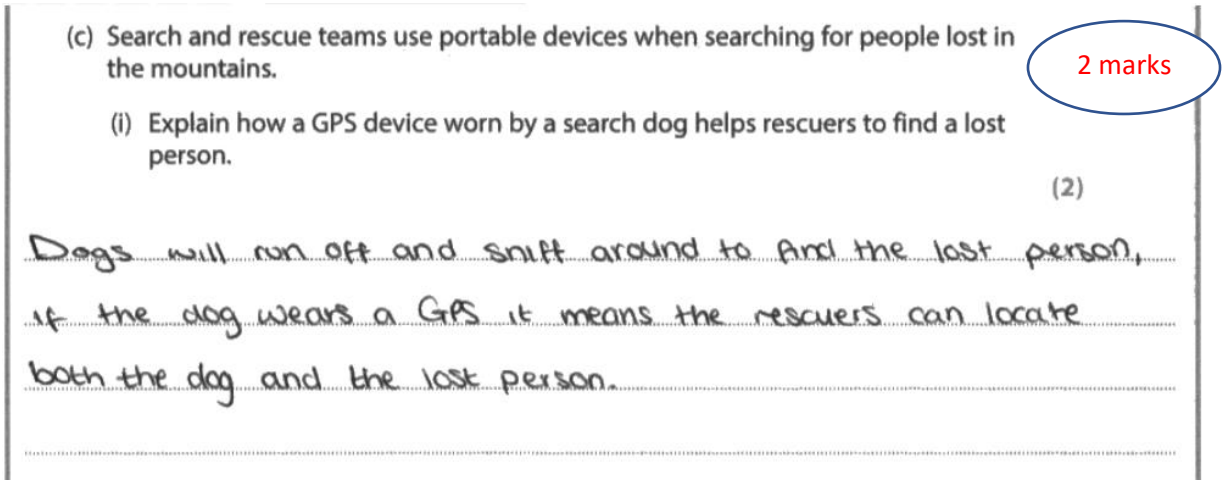
(c) Search and rescue teams use portable devices when searching for people lost in the mountains.

(i) Explain how a GPS device worn by a search dog helps rescuers to find a lost person.

2 marks

(2)

GPS is a satellite communication which allows people to see locations and time. The rescue team can track the dog when it stops which means it has found people. That will then reveal the location of the people.



(c) Search and rescue teams use portable devices when searching for people lost in the mountains.

(i) Explain how a GPS device worn by a search dog helps rescuers to find a lost person.

2 marks

(2)

Dogs will run off and sniff around to find the lost person, if the dog wears a GPS it means the rescuers can locate both the dog and the lost person.

(c) Search and rescue teams use portable devices when searching for people lost in the mountains.

1 mark

(i) Explain how a GPS device worn by a search dog helps rescuers to find a lost person.

(2)

GPS device worn by the dog can be used to calculate the exact position of the dog through satellite, 4 LEO satellite orbiting can track exact location of the dog and can send signals to the portable device to inform ~~~~ the exact position of the dog.

Q02c(ii)

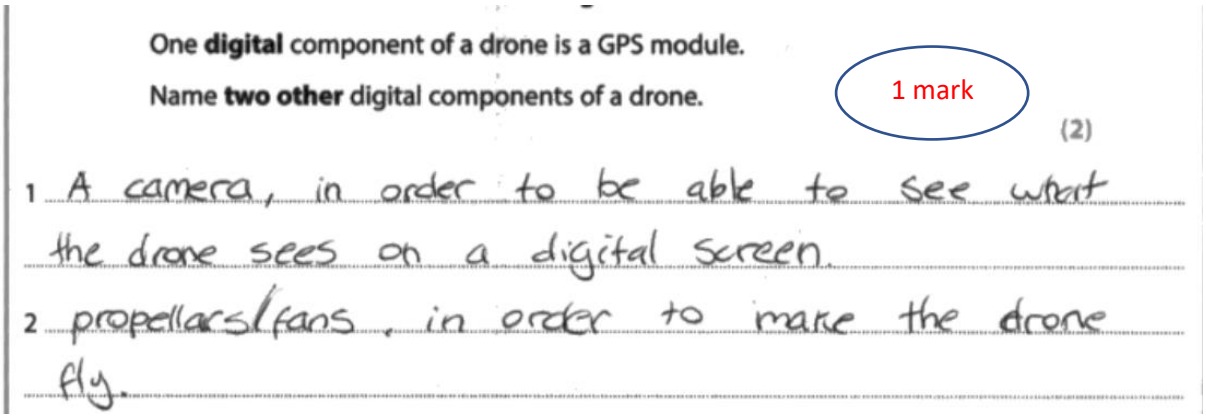
This was another very well answered question.

This question asks students to name two digital components of a drone.

Where responses did not achieve marks, it was mainly due to confusion about the type of connectivity the drone required. There was confusion about RFID tags and Bluetooth communications, which are not suitable over distance. Further, there was confusion about the use of a network interface card (NIC). Infrared communication is not appropriate, as it is line of sight.

Some responses included non-digital components of the drone, such as propellers or wings.

All kinds of sensors were acceptable and awarded to the first bullet in the mark scheme.



One **digital** component of a drone is a GPS module.

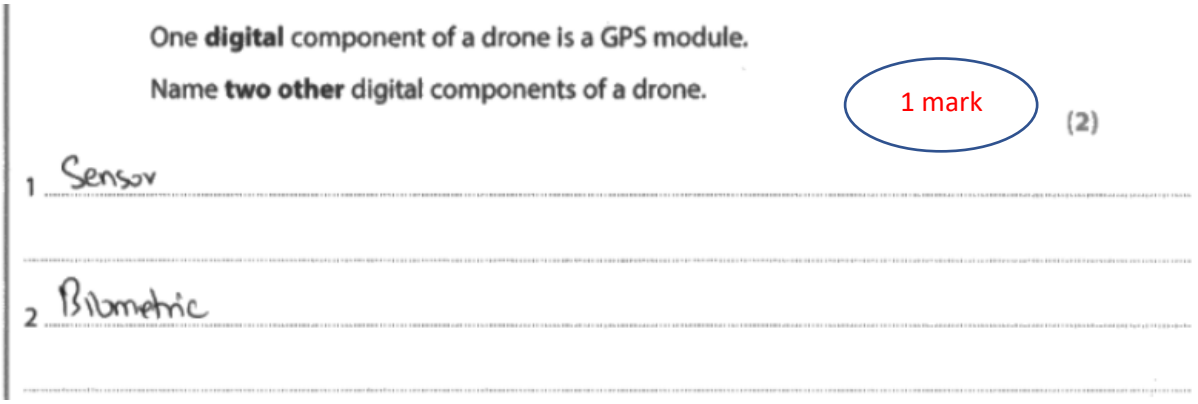
Name **two other** digital components of a drone.

1 mark

(2)

1 A camera, in order to be able to see what the drone sees on a digital screen.

2 propellers/fans, in order to make the drone fly.



One **digital** component of a drone is a GPS module.

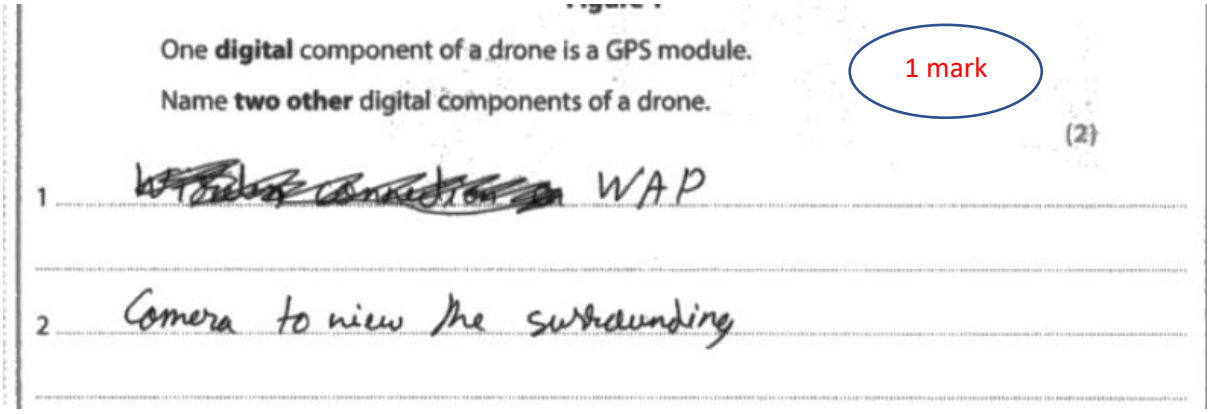
Name **two other** digital components of a drone.

1 mark

(2)

1 Sensor

2 Biometric

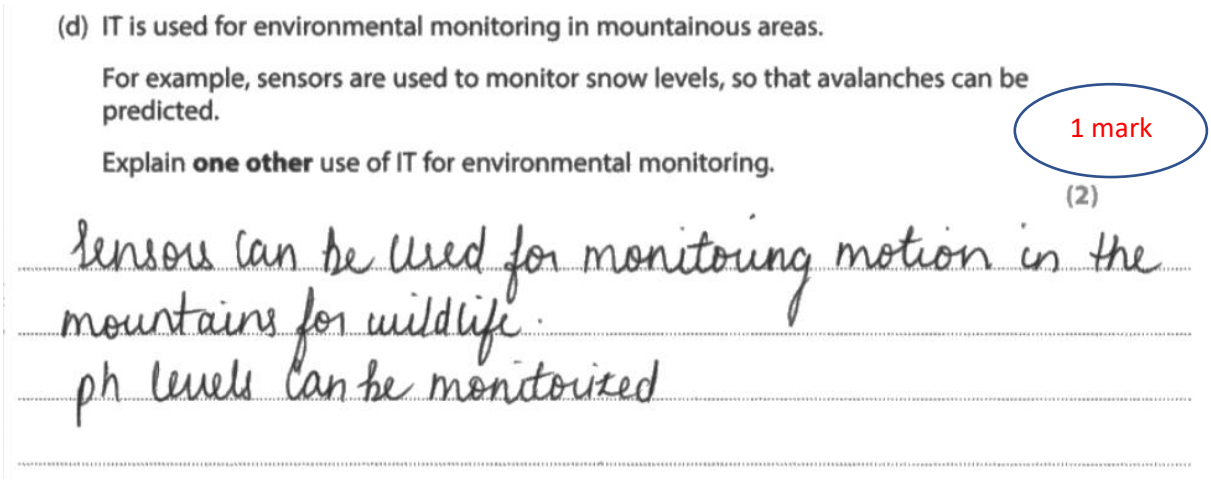


Q02d

This question asks students to explain how IT can be used for environmental monitoring.

This is a contextualised question. A pattern for a response was given in the question. However, students still struggled to contextualise responses to the mountainous areas indicated in the question. Therefore, responses were awarded for other contexts, as long as it was identifiable as impacting the environment.

In common with the other 2-mark explain questions, examiners saw responses that earned the mark for the first statement, but could not earn the mark for the expansion as it was omitted.



(d) IT is used for environmental monitoring in mountainous areas.

For example, sensors are used to monitor snow levels, so that avalanches can be predicted.

Explain **one other** use of IT for environmental monitoring.

(2)

2 marks

can be used to moniter water levels or ~~temperature~~, to predict ~~it~~ it ~~does~~ is going to be any fish.

(d) IT is used for environmental monitoring in mountainous areas.

For example, sensors are used to monitor snow levels, so that avalanches can be predicted.

Explain **one other** use of IT for environmental monitoring.

(2)

2 marks

• Cameras can be used to monitor wildlife, to protect endangered species.

Q03a

This question was very well answered.

This question asks students to name two peripherals attached to an EPOS system. The system is shown as a picture stimulus.

Where a response did not receive full marks, it was commonly due to misuse of subject-specific terminology.

Name **two** peripherals attached to the EPOS system.

(2)

1 terminal (for credit card)

2 QR code

1 mark

Name **two** peripherals attached to the EPOS system.

0 mark

(2)

1 ~~Courtesy~~ Software

2 Hardware

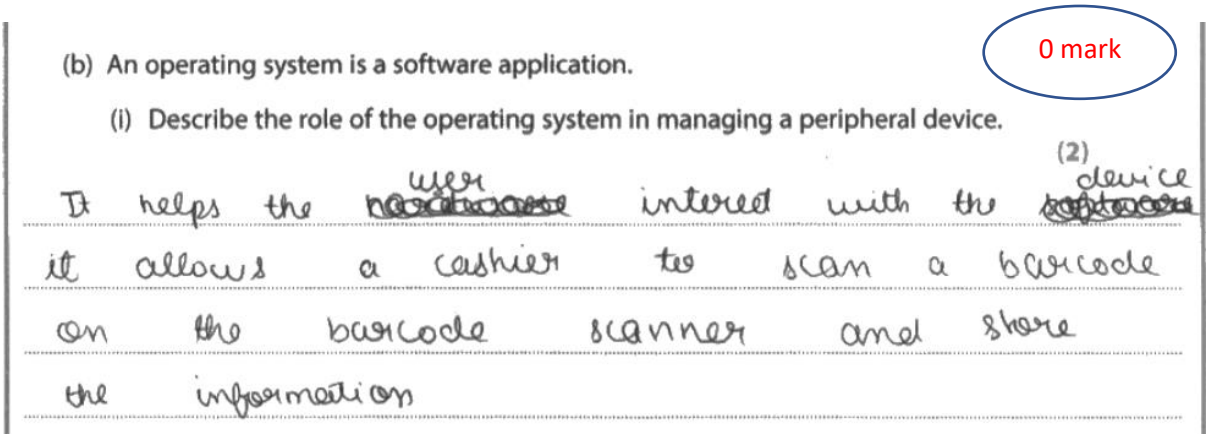
Q03b(i)

This was not answered well, with few responses awarded both marks.

This question explores the role of the operating system in a device, specifically how the operating system manages peripheral devices.

Most responses acknowledged that the operating system acts as a way for the user to interact with the hardware. In this case, the question was specifically about peripheral devices and how the operating system interacts with them. The actions of the user are not included in the context of this question.

Examiners did see vague and non-specific answers, that could not be interpreted to match the mark scheme. Others mistakenly indicated that the operating system gave instructions to the device.



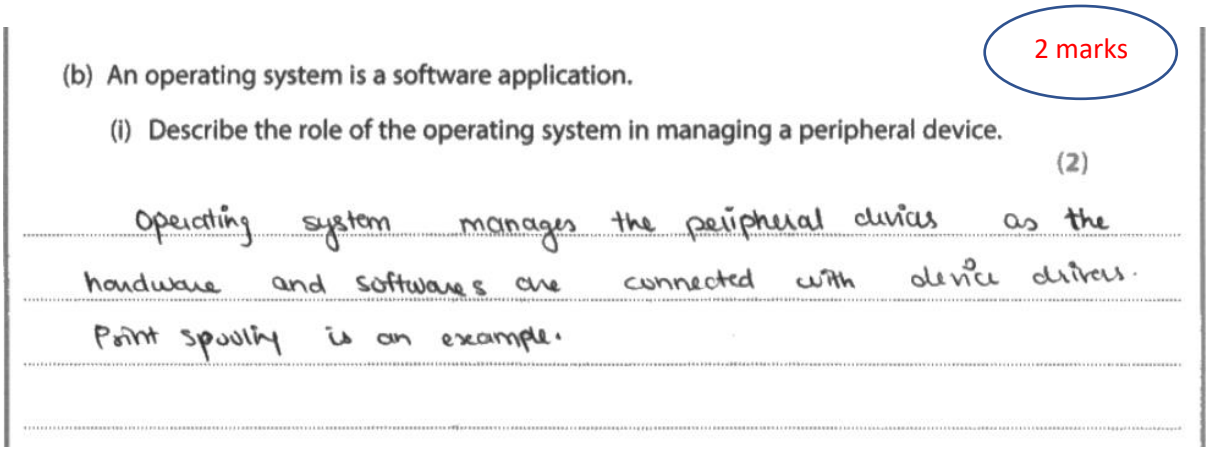
(b) An operating system is a software application.

0 mark

(i) Describe the role of the operating system in managing a peripheral device.

(2)

It helps the ~~hardware~~ user interact with the ~~software~~ device it allows a cashier to scan a barcode on the barcode scanner and share the information



(b) An operating system is a software application.

2 marks

(i) Describe the role of the operating system in managing a peripheral device.

(2)

Operating system manages the peripheral devices as the hardware and softwares are connected with device drivers. Print spooling is an example.

(b) An operating system is a software application.

2 marks

(i) Describe the role of the operating system in managing a peripheral device.

(2)

The role of ~~ope~~ OS is to detect a peripheral device and connect it to the corresponding application.

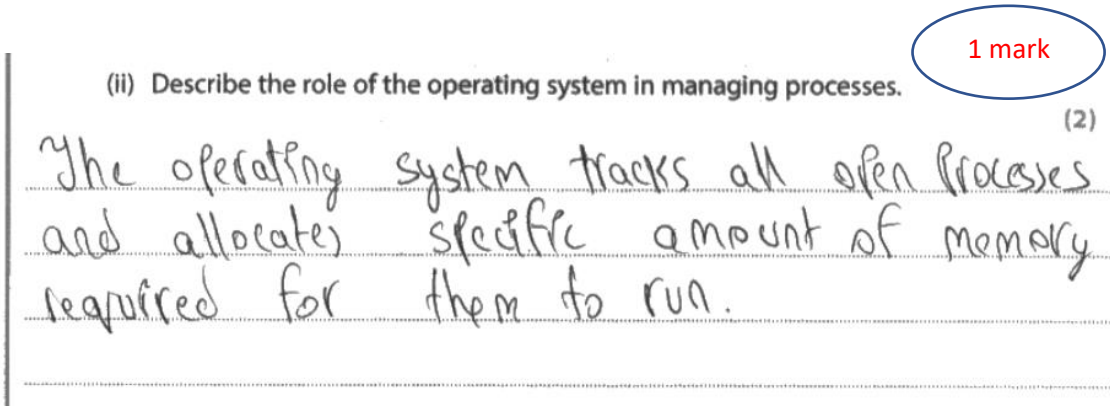
Q03b(ii)

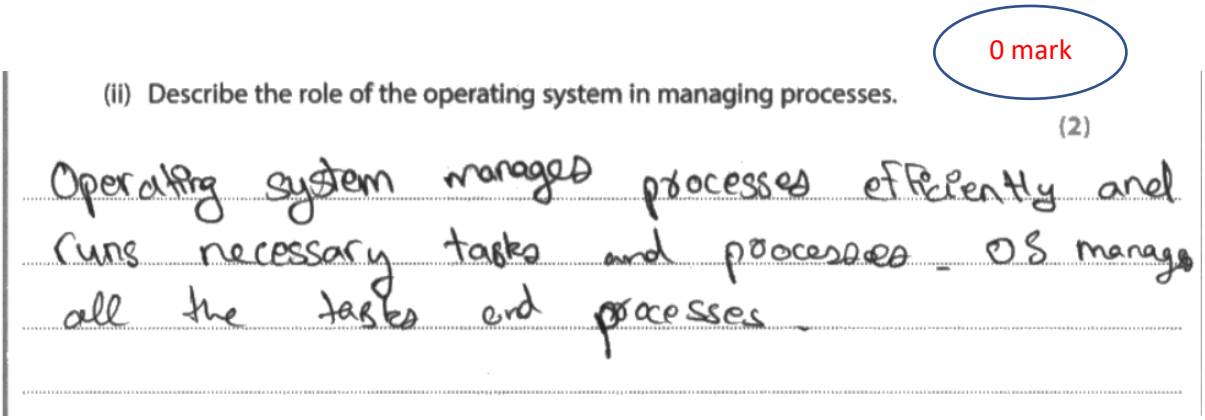
This question was not answered well.

This is the second part of the question about operating systems. This one explores how the operating system manages processes.

Many responses acknowledged that the operating system is responsible for allocating resources, but did not describe what those resources are.

Vague responses such as ensuring all processes run or make sure they run efficiently could not be awarded.





(ii) Describe the role of the operating system in managing processes.

2 marks

(2)

The operating system manages the amount of storage that is being used in each process so that they get a good amount of storage and don't interfere with other processes.

(ii) Describe the role of the operating system in managing processes.

2 marks

The OS determines which tasks are to be carried out by the processor, as well as giving priority to certain processes above others. The ~~OS~~ It stops processes from interferring with other processes

Q03c

This question was well answered, with most responses being awarded marks in the middle band (3-4).

This question is about embedded systems. It is highly scaffolded with a description of how a vending machine works. Responses were required to identify specific embedded systems and explain how each carries out its assigned task in a vending machine.

Examiners saw many responses that defined what an embedded system was. Marks were awarded for this, where they mentioned microprocessors or programs.

Some responses just restated how a vending machine actually works, but remember, that's given in the question.

The best responses identified components and tied them directly to the function they performed in the machine. The table shows components and functions identified in some responses.

Component	**Function**
Coin sorter	Counts money inputted Counts up money to give as change
Note reader	Scan value
Calculator	Add up value of money inputted Calculate change required
Keypad	Select product code
Display	Tell user value of money inputted Tell if code is invalid Not enough money inputted Product not available Product is ready to retrieve Tell amount of change returned
Product sensor	To know if product is empty
Pusher (motor)	To push product forward
Scale	Reads a weight to see if product is dropped
Process	Compare amount of money inputted with amount entered

6 marks

The embedded system makes use of several components to execute these tasks and these components come into play at different parts of the process. The customer ~~inst~~ inserts money into the machine which goes through a reader that identifies the sum of money and this data is stored in temporary storage for the steps that follow. The customer then types in a product code on the keypad and the OS attributes it to the corresponding data stored in the memory of the machine for the same product. The sum of money and the cost of the product are input into the processor which calculates whether the sum of money is sufficient or not and calculates the change due. If the output from the processor states that the money is sufficient then an input is trigerred to the motors that push the product forward. The sum of change calculated by the processor is interpreted by the machine and the right amount of change is dispensed through a trapdoor-like mechanism.

6 marks

The Embedded System will have multiple peripheral device connected to it in order to run all of these processes.

First, the money is inserted. The money is then scanned by a scanner and it identifies the currency and the number of bills to calculate the total amount inserted. This information is stored on the embedded system on a device with RAM, probably an ~~computer~~ embedded computer.

Then the user inputs the product code of the desired item which is then also stored on the embedded computer as well as its price.

The ~~em~~ embedded computer then sends a signal to the rest of the machine where it orders it ~~dispens~~ push the desired product. However, if the ~~machine~~ embedded system ~~detects no~~ detects no product (through a pressure sensor) then it informs the customer, and the money is given back so the process terminates.

When and if the product is pushed into the void, the embedded computer will then calculate the change, ~~find the value of said change~~ it will then send a signal containing the value of said change ~~into~~ to a money dispenser where it will dispense the exact amount. If there is no change and change value is equal to zero, no signal is sent.

6 marks

The embedded system makes use of several components to execute these tasks and these components come into play at different parts of the process. The customer ~~inst~~ inserts money into the machine which goes through a reader that identifies the sum of money and this data is stored in temporary storage for the steps that follow. The customer then types in a product code on the keypad and the OS attributes it to the corresponding data stored in the memory of the machine for the same product. The sum of money and the cost of the product are input into the processor which calculates wether the sum of money is sufficient or not and calculates the change due. If the output from the processor states that the money is sufficient then an input is trigerred to the motors that push the product forward. The sum of change calculated by the processor is interpreted by the machine and the right amount of change is dispensed through a trapdoor-like mechanism.

4 marks

When the customer puts money into the machine the money is scanned and if accepted it will show on a screen on the machine. The machine will also allow access to the customer to now choose the product code. The keypad on the machine receives the code and activates the specific part of the code. If the product is not available a signal is sent on to the little screen which lets the customer know that the product is not available. If the product is available it will be stored down and the customer can return it. The machine then sends the signal and the customer can then receive the change.

Q04a

This question was not answered well, with about one-third of responses recognising the distinction between the devices.

Q04b

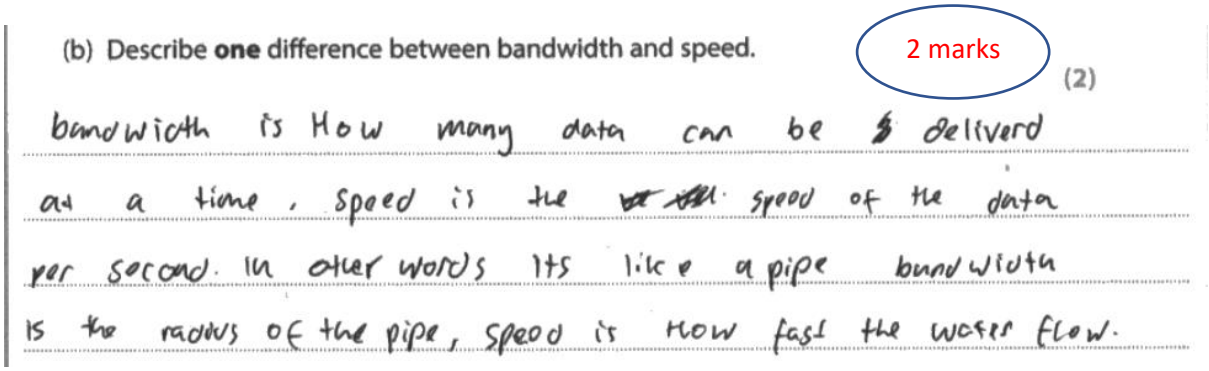
Overall, this question was not well answered. However, many responses earned at least one of the two available marks.

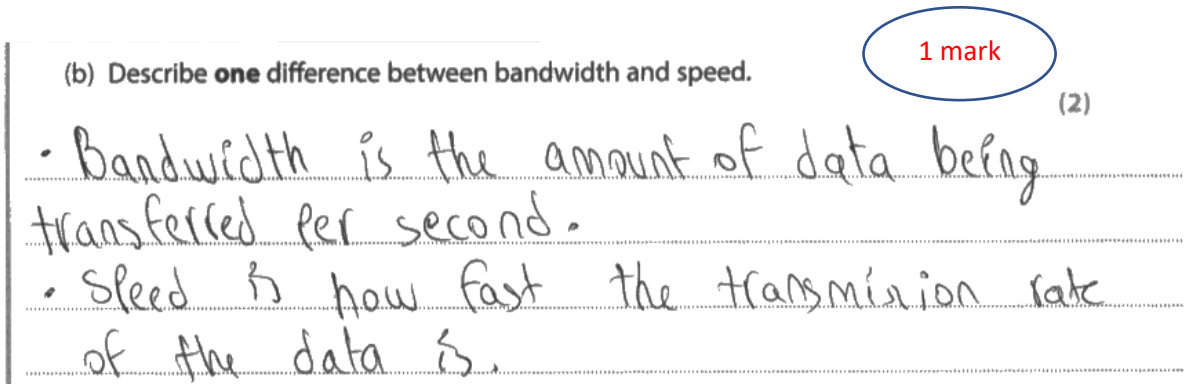
This question asks students to describe the difference between network bandwidth and network speed.

Both are measured in bits per second, so including units does not distinguish the two definitions. The real difference is that speed is how fast data is travelling now/at a specified time and bandwidth is the maximum amount of data that could potentially be travelling at a time, if there were no interferences.

Some responses erroneously indicated that speed is equivalent to time.

Responses mentioned uploading and downloading often, which may mean students have opportunities to measure network speeds. Responses based on this, such as speed being a calculation of a set of speed readings, could not be awarded.





(b) Describe **one** difference between bandwidth and speed.

1 mark

(2)

Bandwidth is the ~~the~~ theoretical speed of data transfer over a network, how much data can travel in one second. ~~whic~~ ~~Whick~~ Speed is the time it takes ~~tat~~ data to travel over a network.

(b) Describe **one** difference between bandwidth and speed.

2 marks

(2)

Speed refers to ~~the time taken for~~ How fast something can be done. bandwidth is the space taken ~~or~~ on how much data can be transferred

Q04c

This question was answered well. Most students received two or more marks for this question.

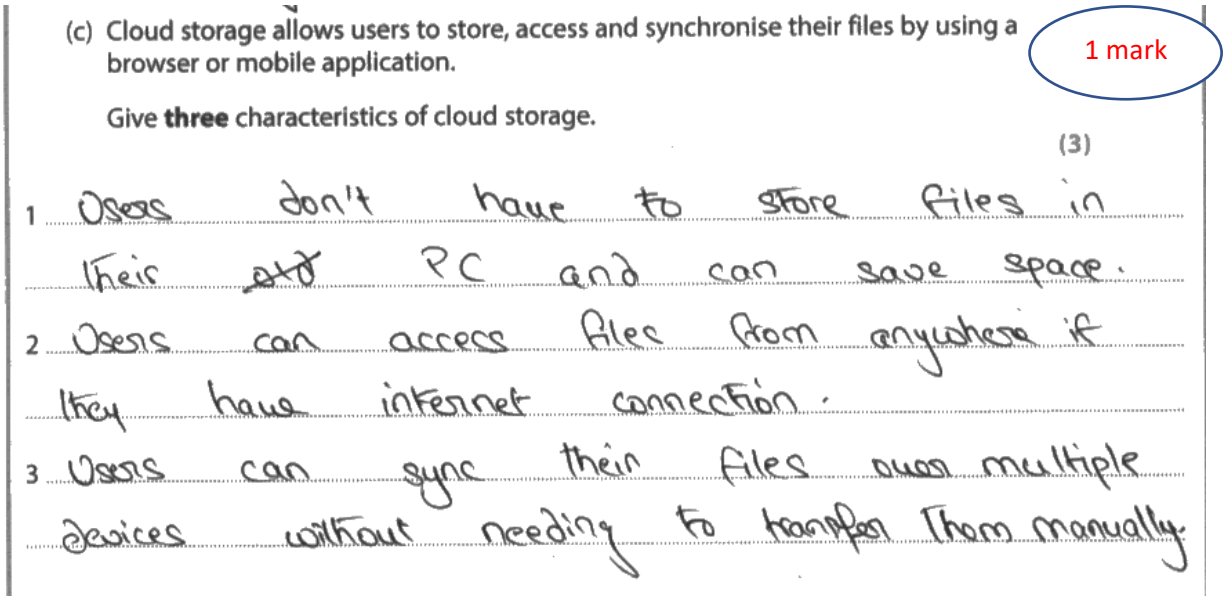
This question asks students to give three characteristics of cloud storage.

However, responses highlighted some misconceptions held by many students. These included the idea that cloud storage could be accessed from any device, anywhere, and at any time. This is not the case, as an Internet connection is not guaranteed on any device, anywhere, and at any time.

The term device, itself is unclear, as a mouse is a device, but cannot access cloud storage.

Other responses indicated that storage space in the cloud is unlimited, but there is a physical limitation. Some responses also thought that cloud storage took up no physical space. Clearly, data in the cloud is actually stored on hard disks located on large storage farms and controlled by servers.

As stated in the introduction, this question focuses on what cloud storage is, not how to use it, what it lets you do, or benefits of it.



(c) Cloud storage allows users to store, access and synchronise their files by using a browser or mobile application.

Give **three** characteristics of cloud storage.

1 mark

(3)

1 Users don't have to store files in their ~~etc~~ PC and can save space.

2 Users can access files from anywhere if they have internet connection.

3 Users can sync their files over multiple devices without needing to transfer them manually.

(c) Cloud storage allows users to store, access and synchronise their files by using a browser or mobile application.

2 marks

Give **three** characteristics of cloud storage.

(3)

1 Cloud storage allows users to ~~[illegible]~~ view the storage from anywhere in the world.

2 You need a connection to the internet before ~~[illegible]~~ accessing cloud storage.

3 Cloud storage is usually free but you can also pay for extra storage.

(c) Cloud storage allows users to store, access and synchronise their files by using a browser or mobile application.

2 marks

Give **three** characteristics of cloud storage.

(3)

1 Must be connected to the internet

2 Does not use hardware storage

3 Data stored in servers

(c) Cloud storage allows users to store, access and synchronise their files by using a browser or mobile application.

Give **three** characteristics of cloud storage.

3 marks

(3)

1 Cloud storage can be used to access ~~anytime~~ files at anytime. from anywhere via internet.

2 Security of data files and recovery is taken care by the host which they are responsible if lost or released.

3 Able to purchase addition ~~storage~~ storage if needed

(c) Cloud storage allows users to store, access and synchronise their files by using a browser or mobile application.

Give **three** characteristics of cloud storage.

(3)

1 cloud storage can be accessed through internet.

2 ~~cloud s~~ extra storage can be bought online.

3 Data backup is available.

Q04d

Although almost all responses were awarded some marks, with the majority in the three to four range, very few were awarded all six marks.

This question asks students to complete a grid to show the type of connectivity, the type of transmission medium, and the type of signal required for different networking situations.

In this question, subject-specific terminology was needed. There appeared to be confusion about the difference between media and protocols, with protocol names appearing in both the media and connectivity columns.

There was confusion between Ethernet, the protocol, and Ethernet cable, the medium.

While some responses incorporated electromagnetic waves in the signal column, few demonstrated the distinction between radio waves and microwaves, and their application as subject-specific terminologies.

- Electromagnetic spectrum includes both radio waves and microwaves. It is a general term.
- Radio waves are a lower frequency than microwaves.
- Radio waves are used by laptops for communication.
- Microwaves are higher frequencies on the electromagnetic spectrum.
- Microwaves are used by satellites to communicate with earth-based stations.

4 marks

Situation	Connectivity	Medium	Signal
Computers and printers in a school share the same servers	~~Wireless~~ wired	Ethernet	Electrical
A laptop communicates with a wireless access point	Wireless	~~Air~~ Air/ nothing	~~Radio~~/ wifi
Two towns on either side of the Atlantic Ocean are connected	Wired	optical cable ~~Underwater cables~~	Electrical
An artificial satellite beams signals to receiving dishes mounted on houses	Wireless	Air/nothing	~~Infra~~ red Radio
Appliances in the home are connected to each other	Wired	Powerline	Electrical

(d) Complete the table to give the type of connectivity, medium and signal for **each** situation.

Some cells have been completed for you.

2 marks

(6)

Situation	Connectivity	Medium	Signal
Computers and printers in a school share the same servers	wired	Powerline	Electrical
A laptop communicates with a wireless access point	wi-fi	Battery	radio
Two towns on either side of the Atlantic Ocean are connected	Wired	Powerline	Electrical
An artificial satellite beams signals to receiving dishes mounted on houses	radiowaves	Solar Panels	radio
Appliances in the home are connected to each other	wired	Powerline	Electrical

(d) Complete the table to give the type of connectivity, medium and signal for **each** situation.

5 marks

Some cells have been completed for you.

(6)

Situation	Connectivity	Medium	Signal
Computers and printers in a school share the same servers	Wired	Copper cable	Electrical
A laptop communicates with a wireless access point	Wireless	Router	Radio
Two towns on either side of the Atlantic Ocean are connected	Wired	fibre optic cable	Light
An artificial satellite beams signals to receiving dishes mounted on houses	Wireless	satellite antenas	microwave
Appliances in the home are connected to each other	Wired	Powerline	Electric

Q05a

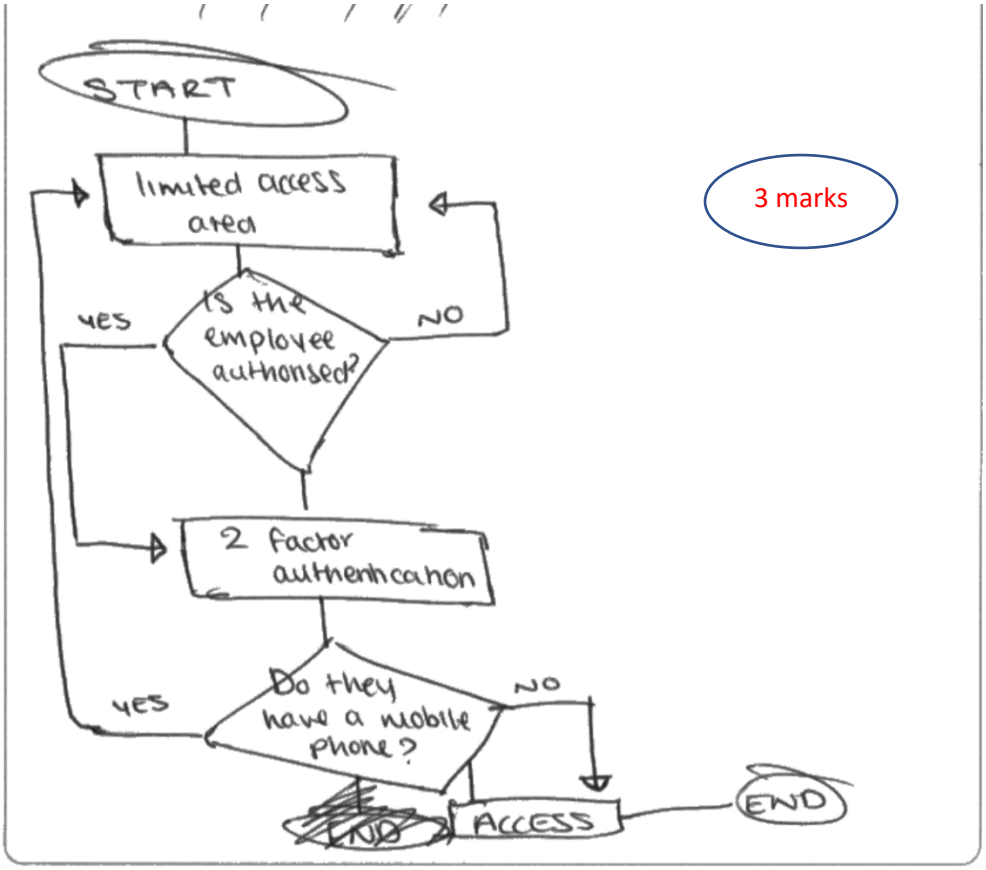
Most responses were awarded three or more marks. There were few responses that earned eight or more marks. A small number of students declined to answer this question.

This question asks students to draw a flowchart showing how two-factor authentication works to allow access onto a train station.

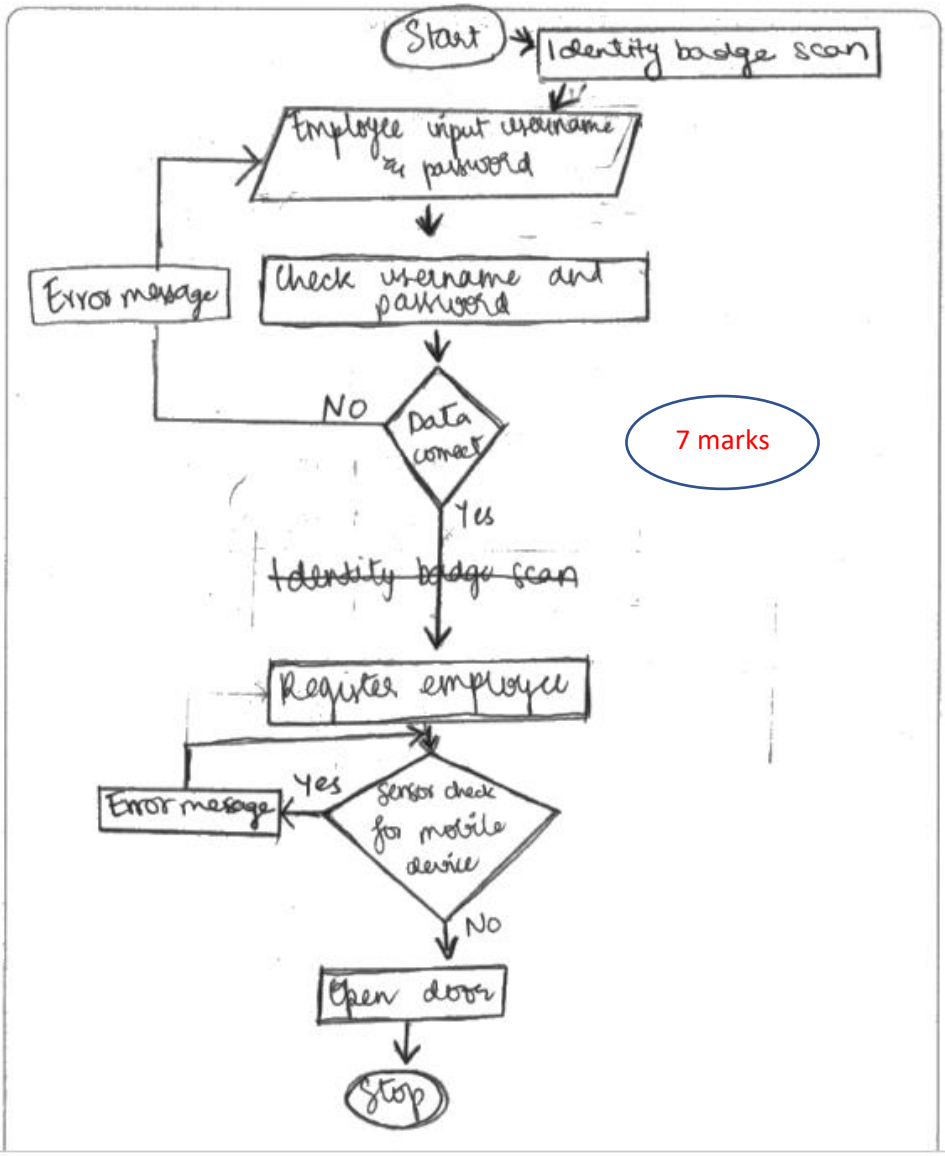
The most commonly lost mark was identifying a 2nd factor and identifying that both factors needed verification from a database. Many responses included logic for checking for mobile phones. This was not required, as restricting mobile phones means that text messages can't be used as the 2nd factor.

Some responses did not use appropriate flowchart symbols. These symbols are a subject-specific notation with which all students should be familiar.

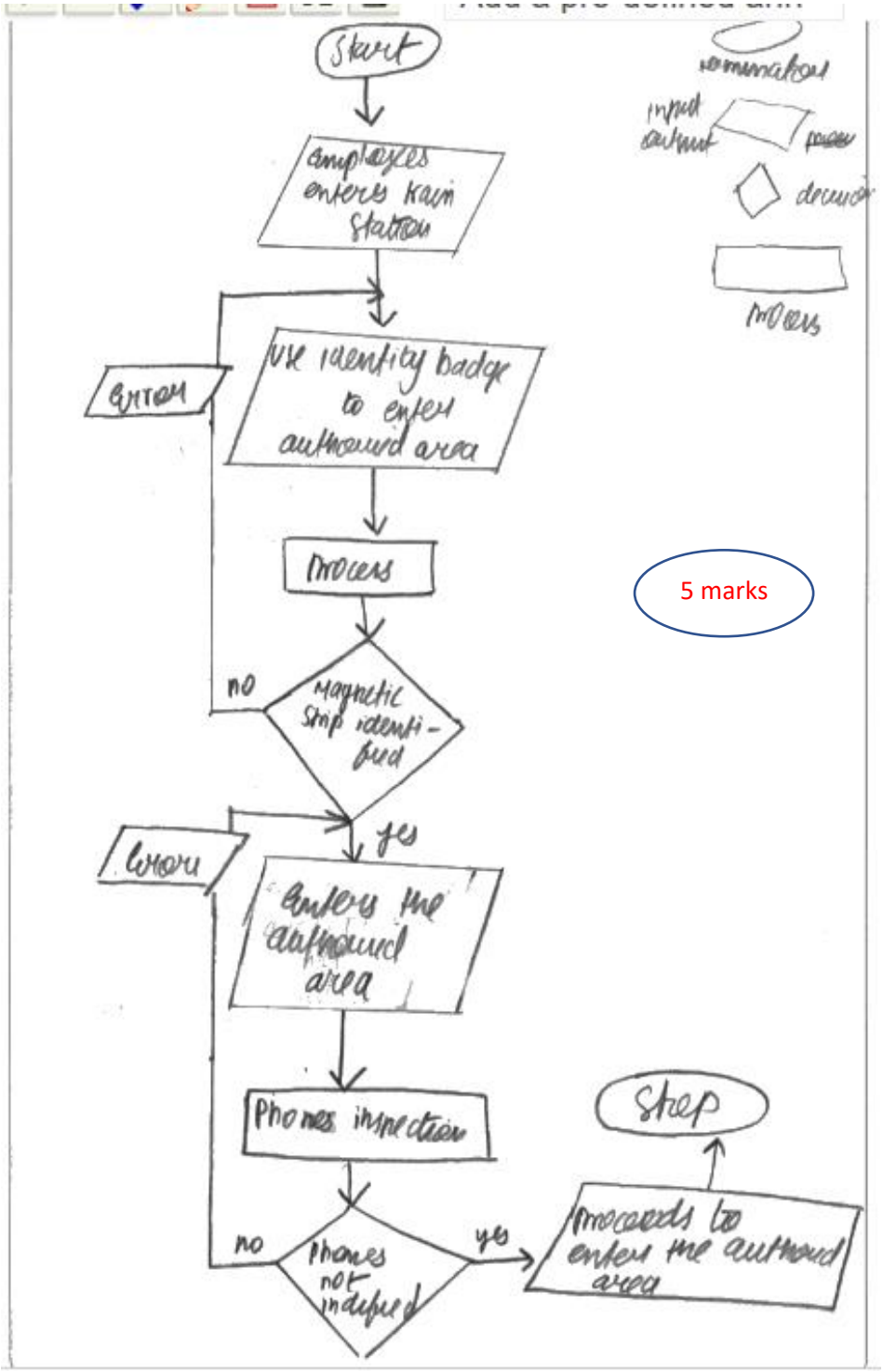
The use of flowchart symbols, in some responses, was not always accurate. It is important to add arrows to the connecting lines so that the direction of flow is clear. This is even more important when the flow is backwards in the flowchart, like a loop. Each symbol should have only a single-entry point, i.e. arrow in. Therefore, when returning backwards into the flowchart the arrow should connect with a line, not a symbol, such as start.


START
limited access area
Is the employee authorised?
YES
NO
2 factor authentication
Do they have a mobile phone?
YES
NO
ACCESS
END

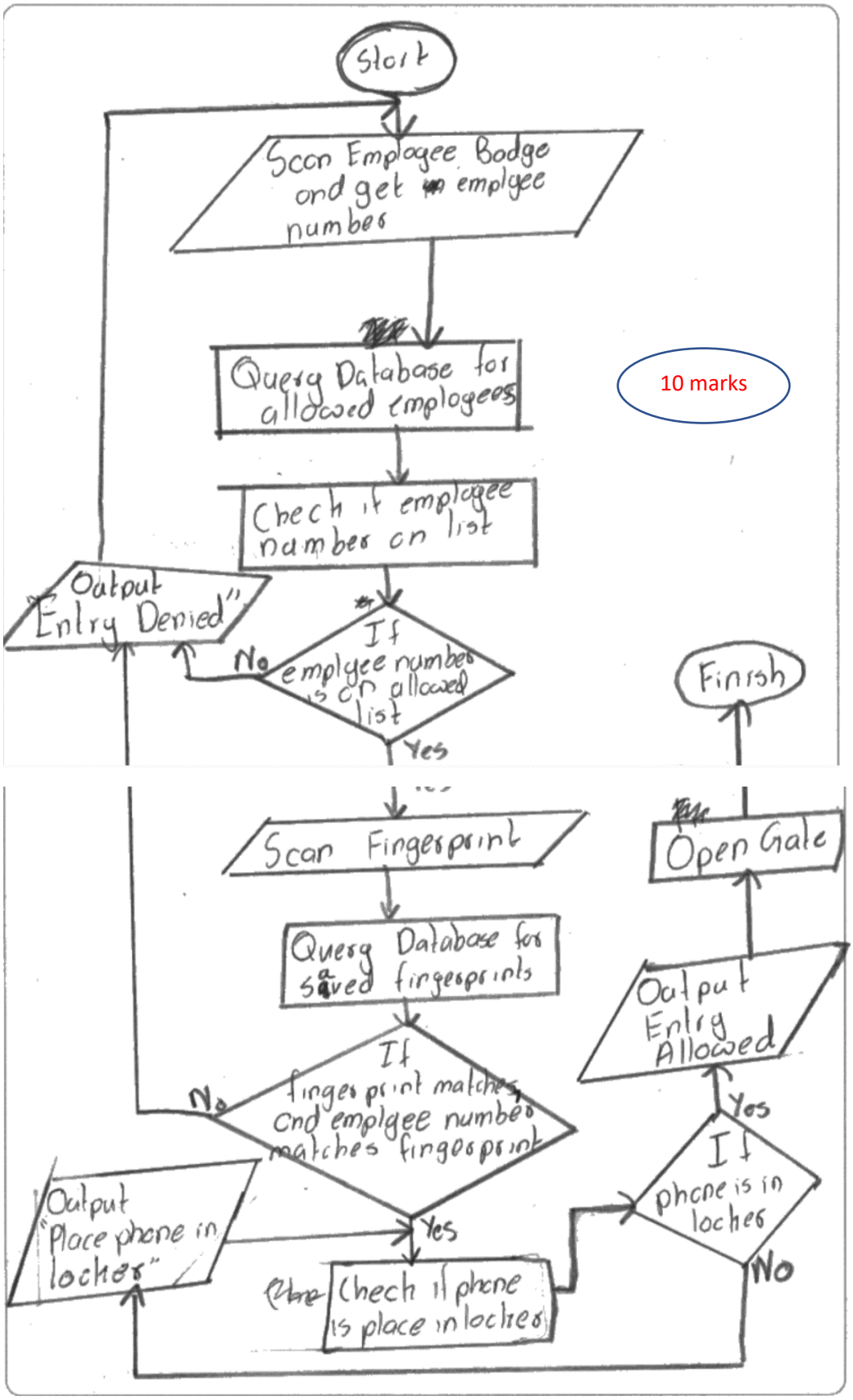
3 marks


Start
Identity badge scan
Employee input username & password
Error message
Check username and password
NO
Data correct
Yes
Identity badge scan
Register employee
Error message
Yes
Sensor check for mobile device
No
Open door
Stop

7 marks


Start
employee enters main station
use identity badge to enter authorized area
enter
Process
no
Magnetic Strip identified
yes
error
enters the authorized area
Phones inspection
no
Phones not identified
yes
proceeds to enter the authorized area
Stop

5 marks


Start
Scan Emplogee Badge and get emplgee numbes
Querg Database for allowed emplogees
Check if emplgee numbes on list
If emplgee numbes is on allowed list
No
Output "Entrg Denied"
Yes
Finish
Scan Fingesprint
Querg Database for saved fingesprints
If fingesprint matches and emplgee numbes matches fingesprint
No
Output "Place phone in lockes"
Yes
Check if phone is place in lockes
If phone is in lockes
Yes
No
Output Entrg Allowed
Open Gate

10 marks

Q05b

The majority of responses were awarded one or two marks. Few responses were awarded all four marks.

The question asks for the completion of an ER diagram in the context of the train company. The bullets tell the student exactly what needs to be added and the notation to use for primary and foreign keys.

The most common errors were inappropriate names for the entity representing the train route and missing the 1:M relationships.

Complete the diagram by adding:

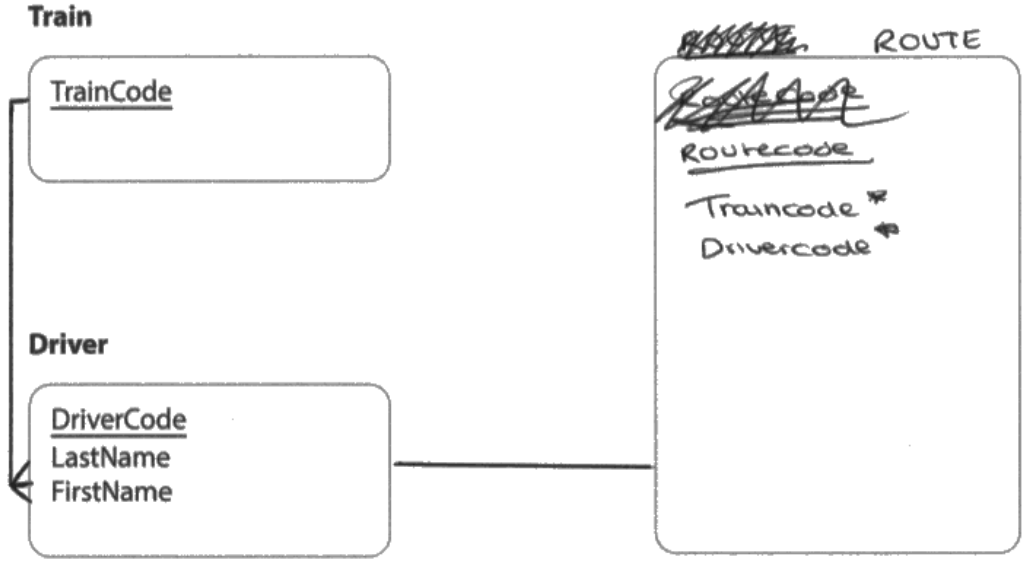
- a name for the entity
- two relationships and relationship types.

Primary keys must be underlined.

Foreign keys must have an asterisk (*).

3 marks

(4)



Complete the diagram by adding:

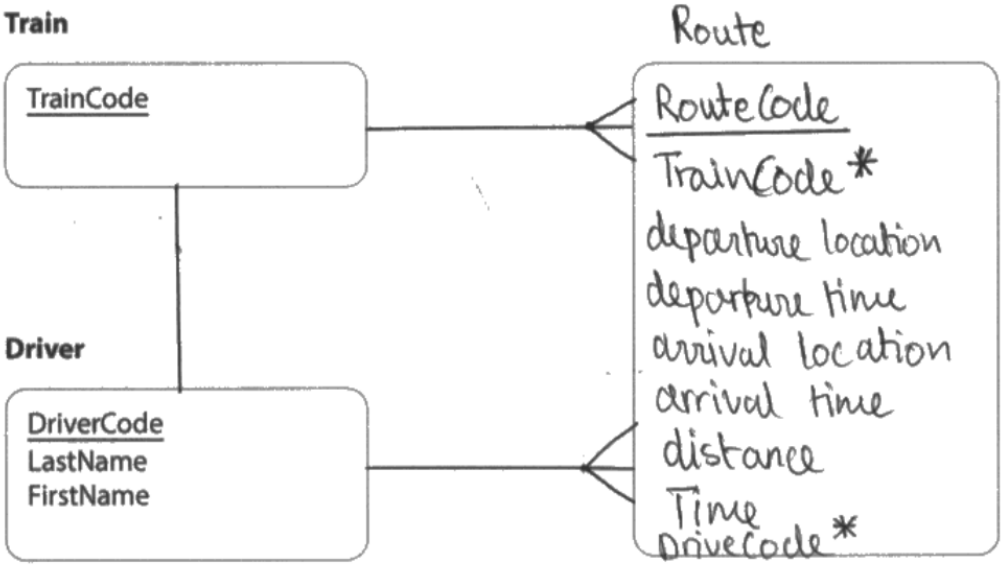
- a name for the entity
- two relationships and relationship types.

Primary keys must be underlined.

Foreign keys must have an asterisk (*).

4 marks

(4)



Complete the diagram by adding:

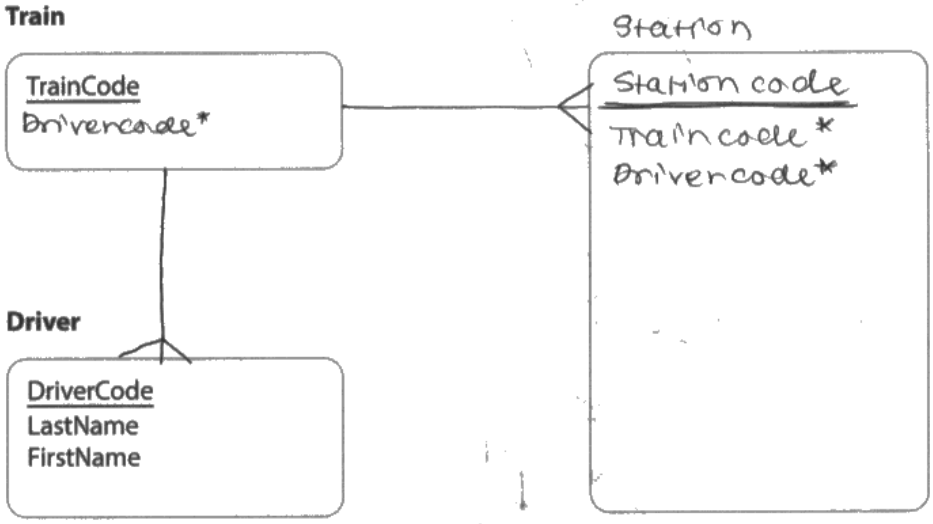
- a name for the entity
- two relationships and relationship types.

2 marks

Primary keys must be underlined.

Foreign keys must have an asterisk (*).

(4)



Q05c

Most responses were awarded one or two marks. Some were awarded three marks, with full marks not often awarded. It was rare to see a response that was syntactically correct.

This question asked for the construction of an SQL statement to delete rows from a table.

The most common error was using equal (=) instead of the keyword LIKE, even when the wildcard expression was correct.

(c) Due to a problem on the track, all trains from Oldhantset are cancelled.

Oldhantset station codes begin with the letters OHS.

The database includes this table.

tbl_arrival				
arrivalID	**platform**	**trainCode**	**sourceStation**	**arrivalTime**
4702	18	WTR8118	OHS339	09:10:00
4688	2	NRL4056	OHA251	09:48:00
4700	10	VRK1032	OHS596	10:10:00
4690	5	WRT8120	CDE786	10:10:00
4693	12	NRL6540	BCD543	10:38:00

Write an SQL statement to remove the trains from Oldhantset from the table.

(4)

~~SELECT * FROM tbl_arrival~~ SELECT
ALTER DELETE * FROM tbl_arrival
WHERE SourceStation LIKE 'OHS%';

4 marks

Write an SQL statement to remove the trains from Oldhantset from the table.

(4)

~~SELECT arrivalID, platform, train~~
DELETE sourceStation
FROM tbl_arrival
WHERE sourceStation LIKE "OHS"

3 marks

Write an SQL statement to remove the trains from Oldhantset from the table.

(4)

~~SELECT~~ REMOVE 'Oldhantset'

FROM , tbl_arrival

WHERE , soureStation = 'OHS%'

And ~~Plat~~ platform > 0

2 marks

Q06a

A full range of marks was awarded for this question. The majority of responses was awarded one or both marks.

This is another example of a 2-mark explain question. In this case, the question is asking for an explanation of how a dataflow diagram is used, not what a dataflow diagram is.

Most responses tried to explain what a DFD is, not how it could be used in an organisation. Most responses, did however, achieve at least one of the available marks.

6 Organisations use a variety of tools and techniques to manage processes and data.

(a) Explain **one** way dataflow diagrams are used by organisations.

(2)

1 mark

Data flow diagram are used to display an easy to understand and vague diagram of the process they intend to use

6 Organisations use a variety of tools and techniques to manage processes and data.

(a) Explain **one** way dataflow diagrams are used by organisations.

(2)

2 marks

Dataflow diagram are by organisations to graphically display the flow of ~~infor~~ data inside a system and break the data down into ~~sep~~ subprocess to understand the details of the events

6 Organisations use a variety of tools and techniques to manage processes and data.

2 marks

(a) Explain **one** way dataflow diagrams are used by organisations.

(2)

Dataflow diagrams provide a top-level view of the ~~pro~~ way data flows in the system for easier understanding of people who may not be experienced at IT systems.

6 Organisations use a variety of tools and techniques to manage processes and data.

2 marks

(a) Explain **one** way dataflow diagrams are used by organisations.

(2)

Organisations use dataflow diagrams to create a visual representation of a system in order to know the processes involved and to ~~identify~~ identify certain pinpoints for improvements.

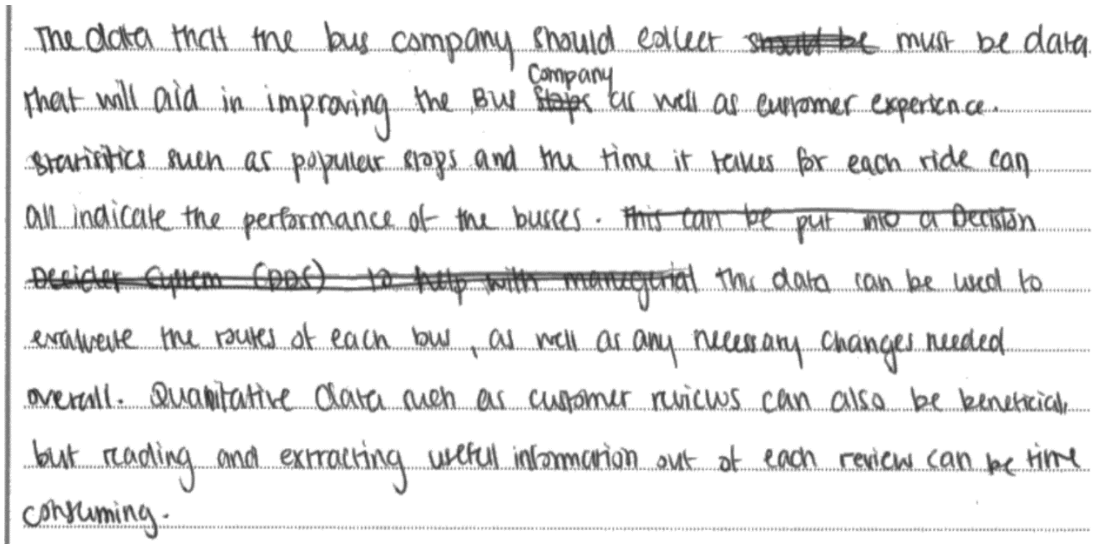
Q06b

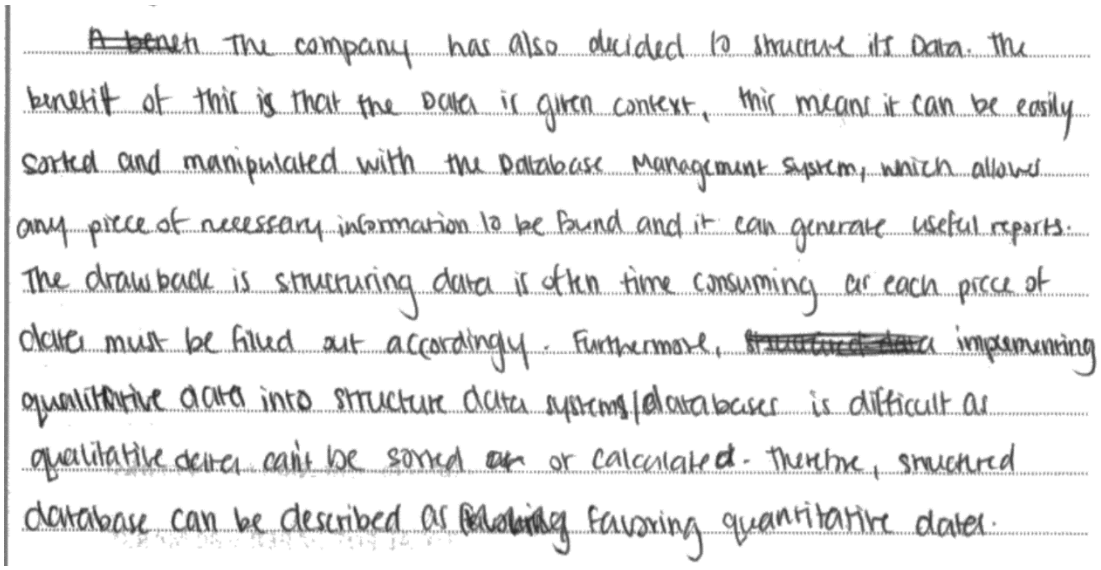
As with the previous essay question, this one was well answered. Most responses were awarded marks in the middle band, five to eight marks.

This question is the big essay question. Students are asked to evaluate the decision, by the train company, to structure its data and store it in a database.

Responses demonstrated some confusion between quantitative/qualitive data and structured/unstructured data. Some stated that qualitative data could not be stored in a database. Qualitative data can be codified before storing in a relational database or can be stored in a NoSQL databa

12 marks


The data that the bus company should collect ~~should be~~ must be data that will aid in improving the Bus ~~Stops~~ Company as well as customer experience. Statistics such as popular stops and the time it takes for each ride can all indicate the performance of the busses. ~~this can be put into a Decision Decider System (DDS) to help with managerial~~ the data can be used to evaluate the routes of each bus, as well as any necessary changes needed overall. Quantitative data such as customer reviews can also be beneficial, but reading and extracting useful information out of each review can be time consuming.


~~A benefit~~ The company has also decided to structure its data. The benefit of this is that the data is given context, this means it can be easily sorted and manipulated with the Database Management System, which allows any piece of necessary information to be found and it can generate useful reports. The drawback is structuring data is often time consuming as each piece of data must be filled out accordingly. Furthermore, ~~structured data~~ implementing qualitative data into structure data systems/databases is difficult as qualitative data can't be sorted ~~or~~ or calculated. Therefore, structured database can be described as ~~favoring~~ favoring quantitative data.

The value of the knowledge that can be extracted from the data is greatly beneficial to the company. Figures such as average gas consumption, ride time, customer count can all aide in making crucial decisions that will lead to decreased costs for the company and better customer experience. For example, using average gas consumption figures, the company can evaluate whether or not they spend too much on gas by comparing those figures to sales and expenditures.

In conclusion, I think the company chose the right choice by choosing to collect and store data into a database, which can be manipulated by SQL, and this data can help the company greatly by ~~improving the~~

8 marks

The data collected and stored by the bus company can be used to identify traveling patterns of different customers in different areas. These patterns can tell the company about most used routes by customers and least used routes by customers. The bus company can then accordingly make decisions about increasing the number of busses covering certain routes, so that the crowded areas can accomodate more people and waiting times would decrease because number of busses increased and they travel more frequently. As a result, customers would be satisfied because of quick service and the brand reputation would increase. This would satisfy stakeholders, as more customers would use the busses and more reverene would be generated.

The benefits of structuring the company data are that, information can be easily located, about certain customers, busses or routes. This will save the company a lot of time as they do not have to go through a lot of data to find specific information.

However, structuring the data will require a lot of investments in servers and storage units. The computers will require electricity to run, which will increase costs.

The bus company may use the customers data to track their traveling patterns without their permission which is an invasion of privacy. The company may sell the data to the government.

The drawbacks of structuring data are that it will increase costs to hire someone to sort the data. It is also a time consuming process, and the database needs to be constantly updated.

3 marks

the company can store its data, like bus IDs, drivers IDs and names, stations locations, ~~ja~~ it has benefits like they can access to the data again if any problem happen to (because it will be just stored), data will be organized, ~~and~~ simple and easy to read and understand, they can use the stored and structured data to improve ~~from~~ the company, however, storing the data and structuring it might cost them time and money, they can easily lose the data if any damage happen to the servers, ~~they can~~ the information can get hacked, ~~they~~ the structured data isn't 100% real because mistakes can happen. ~~By structuring the data, the company can get benefit from it~~

So, I think that ~~str~~ structuring data will be helpful for the company but they should be aware and ready for anything and face chalanges.

Summary

- Use subject-specific terminology accurately in all responses
- Identify the requirements of the response from the command word used in the question
- Identify the requirement for subject-specific notation as indicated in the question
- Ensure your response is phrased in the context of the question, if there is one
- Use the bullets provided in the large discussion question to structure your response

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