T Level Technical Qualification in Digital Business Services

Core knowledge and understanding

Paper B

Mark Scheme

This Mark Scheme has been written by the assessment writer and refined, alongside the relevant questions, by a panel of subject experts through the external assessment writing process and at standardisation meetings.

The purpose of this Mark Scheme is to give you:

- examples and criteria of the types of response expected from a student
- information on how individual marks are to be awarded
- the allocated assessment objectives (AOs) and total mark for each question.

Marking guidelines

General guidelines

You must apply the following marking guidelines to all marking undertaken throughout the marking period. This is to ensure fairness to all students, who must receive the same treatment. You must mark the first student in exactly the same way as you mark the last.

- The Mark Scheme must be referred to throughout the marking period and applied consistently; do not change your approach to marking once you have been standardised.
- Reward students positively giving credit for what they have shown, rather than what they might have omitted.
- Utilise the whole mark range and always award full marks when the response merits them.
- Be prepared to award zero marks if the student's response has no creditworthy material.
- Do not credit irrelevant material that does not answer the question, no matter how impressive the response might be.
- The marks awarded for each response should be clearly and legibly recorded in the grid on the front of the question paper.
- If you are in any doubt about the application of the Mark Scheme, you must consult with your team leader or the chief examiner.

Guidelines for using extended-response marking grids

Extended-response marking grids have been designed to assess students' work holistically. They consist of bands-based descriptors and indicative content.

Bands-based descriptors: each band is made up of several descriptors for across the AO range, AO1 to AO3, which, when combined, provide the quality of response that a student needs to demonstrate. Each band-based descriptor is worth varying marks.

The grids are broken down into bands, with each band having an associated descriptor indicating the performance at that band. You should determine the band before determining the mark.

Indicative content reflects content-related points that a student may make but is not an exhaustive list. Nor is it a model answer. Students may make all, some or none of the points included in the indicative content as its purpose is as a guide for the relevance and expectation of the responses. Students must be credited for any other appropriate response**.**

Application of extended-response marking grids

When determining a band, you should use a bottom-up approach. If the response meets all the descriptors in the lowest band, you should move to the next one, and so on, until the response matches the band descriptor. Remember to look at the overall quality of the response and reward students positively, rather than focusing on small omissions. If the response covers aspects at different bands, you should use a best-fit approach at this stage and use the available marks within the band to credit the response appropriately.

When determining a mark, your decision should be based on the quality of the response in relation to the descriptors. You must also consider the relative weightings of the AOs, so as not to over / under credit a response. Standardisation materials, marked by the chief examiner, will help you with determining a mark. You will be able to use exemplar student responses to compare to live responses, to decide if it is the same, better or worse.

You are reminded that the indicative content provided under the marking grid is there as a guide and therefore you must credit other suitable responses a student may produce. It is not a requirement either that students must cover all the indicative content to be awarded full marks.

Assessment objectives (AOs)

This assessment requires students to:

AO1: Demonstrate knowledge and understanding of the digital business services sector
AO2: Apply knowledge and understanding of the digital business services sector to different situations and contexts
AO3: Analyse and evaluate information and issues related to the digital business services sector

The weightings of each AO can be found in the Qualification Specification.

Section A: tools and testing

This section is worth 22 marks.

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1   **Which** one **of the following is a purpose of testing digital components?**

      A impact assessment
      B port scanning
      C prioritise the causes
      D risk management

[1 mark]

AO1 = 1 mark

A impact assessment

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2   **State** one **project management methodology.**

[1 mark]

AO1 = 1 mark

Award **one** mark for:

- agile (1)
- waterfall (1)
- spiral (1)
- rapid application development (RAD) (1).

Accept any other suitable response.

3	A community garden project is creating a beginners' gardening course with five members producing the course content. As part of the course creation process, the five members are reviewing and editing course materials to ensure they are accurate and easy to understand. They currently print out sections and give written feedback to each other. One member suggested using a mark-up tool.
(a)	**Describe** one **purpose of a mark-up tool.** [1 mark]

AO1 = 1 mark

Award **one** mark for:

- A mark-up tool is used to highlight where edits or changes have been made in a document (1).

Accept any other suitable response.

(b)	**Explain** one **benefit to the community garden group of using a mark-up tool to provide feedback.** [2 marks]

AO2 = 2 marks

Award **one** mark for each explanation point, up to a maximum of **two** marks:

- One benefit of using a mark-up tool is that it draws attention to specific elements (1). This means that if there is anything complex that they are trying to feedback to the community garden group the markup can help to make the information more understandable (1).
- By using mark-up in the documents, it will make it easier to give feedback to all members of the gardening group (1). Instead of describing changes or edits, they will be able to directly annotate the specific area needing attention (1).
- Using mark-up tools on documents will help the community garden club clarify points, highlight areas of interest, and provide precise instructions (1). It will allow for clearer communication among all its members and anyone working on the document (1).

Accept any other suitable response.

4	Mia and Ayesha run a car wrap business where Mia designs and prints the vinyl wrap, while Ayesha applies it to the cars. They currently charge a flat fee for the service and are profitable but are unsure of their costs. They plan to use a budget sheet to better understand their costs.
(a)	**Describe** one **purpose of a budget sheet.**
	[1 mark]

AO1 = 1 mark

Award **one** mark for a description of a purpose of a budget sheet:

- A budget sheet is a financial document that a business uses to organise and document the finances of a project over its lifespan (1).

Accept any other suitable response.

(b)	**Explain** one **way a budget sheet would help Ayesha and Mia to understand how much each step of their process costs.**
	[2 marks]

AO2 = 2 marks

Award **one** mark for each explanation point, up to a maximum of **two** marks:

- A budget sheet will help Ayesha and Mia to track how much they spend on the materials for each stage of the car wrapping process (1) so that they can understand and track their expenditure (1).
- Using a budget sheet will enable Mia and Ayesha to identify if they are charging enough for their services by seeing how much overall each wrap is costing and how much it costs to run the business (1), which will ensure that they don't make a loss on the wraps (1).

Accept any other suitable response.

5	A website design company has created a digital feedback form for a local business. Customers of the local business are experiencing difficulties filling certain sections of the form and submitting it.
(a)	**Identify** two **processes of root cause analysis**.

[2 marks]

AO1 = 2 marks

Award **one** mark for each identified process, up to a maximum of **two** marks:

- identify solutions to the underlying problem (1)
- identify what caused the problems (1)
- implement the change (1)
- monitor and sustain (1).

Accept any other suitable response.

(b)	**Explain** two **ways the company can use root cause analysis to resolve this issue.**

[4 marks]

AO2 = 4 marks

Award **one** mark for each explanation point, up to a maximum of **four** marks:

- Root cause analysis is a tool that the company can use to identify what has caused an issue with its digital form, such as the form not working (1). By understanding the cause of the issue, it can identify suitable solutions to the problem (1).
- It can start by collecting data on the reported issues (1), which will allow it to investigate causes of the problem with the form (1).
- It can prioritise the problems the feedback form is having by listing which are the most impactful (1). It can then develop a plan according to priority about implementing changes needed to fix the feedback form (1).
- Once it has identified the plan to fix the issues it will need to implement those changes by fixing the issues (1) and this will be followed by testing the fix has worked to ensure that the form is now working as expected (1).

Accept any other suitable response.

6	WPSV Ltd is a business that offers cyber security services to its clients. It tests its clients' IT infrastructures to identify any areas of their systems that hackers could access to steal their data. **Explain** one **reason why WPSV Ltd would use penetration testing.** [2 marks]

AO2 = 2 marks

Award **one** mark for each explanation point, up to a maximum of **two** marks:

- Penetration testing would allow WPSV Ltd to find the vulnerabilities in the client's IT infrastructure in a controlled environment (1) so that they could fix these and protect their data (1).
- WPSV Ltd would carry out penetration testing on their clients' systems so that the clients could see what damage a real hacker could do to their IT infrastructure (1) and fix it before this happens in a real setting (1).

Accept any other suitable response.

7	Moupow Design Studios Ltd specialises in creating apps for trade businesses like plumbers and electricians. It has been approached by a plumbing company to build an app that uses augmented reality (AR) for designing and visualising a new bathroom. To ensure its success, Moupow Design Studios Ltd is planning to conduct concept, usability and stress testing before launching it to customers. **Assess the importance of Moupow Design Studios Ltd using** one **of these testing methods when developing the new bathroom design app for the plumbing business.** [3 marks]

AO3 = 3 marks

Award **one** mark for each assessment point, up to a maximum of **three** marks:

- It is important Moupow Design Studios Ltd use concept testing to check that the project is possible before investing time and money into it (1). It will need to check the AR technology required exists as well as works in the way needed for customers to see the bathrooms and this will allow identification of potential problems early on (1). Though concept testing can be time-consuming it will help for necessary changes to be made before investing more time / money into the project (1).
- It is very important to carry out usability testing when developing the app to ensure that it does what the client needs it to do (1). This type of testing will further enable Moupow Design Studios Ltd to identify any areas where the app could be more user-friendly and therefore increasing the app's chances of success (1) so this testing is extremely important as it will check how easy it is for customers to use and if it works properly most of the time (1).

- Stress testing will be important to Moupow Design Studios Ltd as it will be giving the app to real customers to use and checking whether the app functions as it is meant to (1). This will help identify any weaknesses in the app that could affect the app's functionality enabling necessary changes to be made before launching the app to customers (1). However, this is time-consuming and there is a risk that the app may perform differently in real-world conditions compared to the testing environment (1).

Accept any other suitable response.

8	**Axeworth Entertainment Ltd specialises in unique social activities for clients, such as axe throwing, tank driving and hot tub canal boats.** **It is now developing a new activity that lets customers graffiti a wall in a warehouse located 50 miles from its main office. To facilitate collaboration with the owner, Axeworth Entertainment Ltd is exploring the use of a digital workspace.** **Discuss ways that Axeworth Entertainment Ltd could utilise a digital workspace to enable collaborative working with the warehouse owner to develop its new activity.** **Your response must include reasoned judgements and conclusions.** [3 marks]

AO3 = 3 marks

Award **one** mark for each point discussion point, up to a maximum of **three** marks:

- A shared workspace will be useful to Axeworth Entertainment Ltd for this project as each member of the project team will be able to see the documents that are being worked on and can respond quickly (1). This will mean that the project team will be able to get quick responses to work such as budgets for the project, the cost of the activity and materials needed, which will mean they can get the graffiti activity running quickly (1). In conclusion, implementing a shared workspace for Axeworth Entertainment Ltd project team will result in efficient collaboration and faster response times, ultimately facilitating the successful execution of the graffiti activity (1).
- Axeworth Entertainment Ltd would benefit from using a shared workspace with its partner as it will save on costs as Axeworth Entertainment Ltd and the owner of the warehouse are not near each other, and it would cost a lot of time and money for one party to visit the other party each time a meeting is needed (1). The shared workspace means that during meetings everyone involved can access an online meeting and all will have live access to the documents enabling edits to be made and approved in the meetings about the new graffiti project (1). In conclusion, having a shared workspace will save time and money for Axeworth Entertainment Ltd and its partner as well as increase efficiency and collaboration during meetings (1).

Accept any other suitable response.

Section B: legislation and security

This section is worth 38 marks, plus 3 marks for quality of written communication (QWC) and use of specialist terminology.

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9   **State** one **UK law that businesses operating online need to adhere to.**

[1 mark]

AO1 = 1 mark

Award **one** mark for:

- Health and Safety at Work etc. Act (HASAWA) 1974 (1)
- The Health and Safety (Display Screen Equipment) Regulations 1992 (1)
- Investigatory Powers Act 2016 (1)
- Computer Misuse Act 1990 (1)
- Digital Economy Act 2017 (1)
- Copyright, Designs and Patents Act 1988 (1)
- Waste Electrical and Electronic Equipment (WEEE) Directive 2012 (1)
- Human Rights Act 1998 (1)
- Data Protection Act 2018 (1)
- GDPR (General Data Protection Regulation) (1)
- Freedom of Information Act 2000 (1)
- The Public Sector Bodies (Websites and Mobile Applications) (No.2) Accessibility Regulations 2018 (1)

Note: accept correct acronyms / act without the date.

Accept any other suitable response.

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10   **State** one **of the National Cyber Security Centre's (NCSC) Cyber Essentials.**

[1 mark]

AO1 = 1 mark

Award **one** mark for:

- firewall (1)
- controlling access to data and services (1)
- protection from viruses and malware (1)
- up-to-date software and devices (1)
- choosing most secure settings for devices and software (1).

Accept any other suitable response.

11	Freddie's Equine Services Ltd currently provides boarding stables and horse-riding lessons. Customers are requesting a mobile app to book lessons and services, but the owner lacks the knowledge to make one. The business needs some guidance on what to consider before implementing digital services. It has been advised that firstly it should contact digital professional organisations that can provide information on any industry standards that it should be aware of.
(a)	**Identify** two **professional organisations that can offer guidance and support on industry standards.** [2 marks]

AO1 = 2 marks

Award **one** mark for each professional organisation identified, up to a maximum of **two** marks:

- British Standard (BS) (1)
- International Organization for Standardization (ISO) (1)
- Institute of Electrical and Electronics Engineers (IEEE) (1).

Accept any other suitable response.

(b)	**Explain how** one **of these organisations can help Freddie's Equine Services Ltd to meet industry standards.** [2 marks]

AO2 = 2 marks

Award **one** mark for each explanation point, up to a maximum of **two** marks:

- The British Standards (BS) is an organisation that sets minimum technical specifications for products (1), which will help Freddie's Equine Services to ensure that as they develop the app that they are meeting minimum levels of standards, so customers know that the app is safe and meets minimum levels of quality (1).
- The International Organization for Standardization (ISO) is an organisation that sets international standards for a wide range of things like minimum standards for collecting data analytics ISO 19731 (1), which could help the owner of Freddie's Equine Services Ltd to ensure that it understands how to use the data it collects from the app and analyse it to improve its services (1).
- The Institute of Electrical and Electronics Engineers (IEEE) is a group offering advice and guidance on computing and technology and sets standards for professional conduct and technology so Freddie's Equine Services Ltd could use the IEEE's Code of Ethics to help it to develop a code of conduct for its app (1) so that staff and customers are treated fairly using the app (1).

Accept any other suitable response.

> **12**   **Mug's Paradise is a coffee shop that offers free Wi-Fi to all its customers. At present, customers need to connect to the Mug's Paradise Wi-Fi, and they can then surf the internet.**
>
> **(a)**   **Identify** one **threat posed by allowing customers password free access to the Wi-Fi.**
> [1 mark]

AO1= 1 mark

Award **one** mark for:

- corruption of a system or data (1)
- damage to system operations (1)
- disclosure of private information and credentials (1)
- essential security updates not installed (1)
- loss of sensitive information (1)
- overload of the system to affect a service (1)
- unauthorised access to the system or service (1).

Accept any other suitable response.

> **(b)**   **Explain** two **ways this threat could impact Mug's Paradise or its customers.**
> [4 marks]

AO2 = 4 marks

Award **one** mark for each explanation point, up to a maximum of **four** marks:

- A risk the open access Wi-Fi poses to Mug's Paradise is the Wi-Fi being used to carry out illegal activities such as hacking other customers' devices connected to the Wi-Fi and stealing the customers' data (1), which could cause financial difficulties for customers if their data is stolen (1).
- An unsecured Wi-Fi connection for Mug's Paradise could result in attackers setting up a fake Wi-Fi network with a similar name (1). This would trick customers into connecting to the fake wireless network and then expose their data to the attackers (1).
- This could leave customers open to data loss as any viruses or hackers targeting the business would also then have access to the customer's device (1). This means that they could lose their data through stealing or corruption or be the victim of ransomware demands to give control of their device back (1).
- By not having a password on the Wi-Fi anyone in the local area could join the Wi-Fi even if they are not a customer (1). As more people connect to the Wi-Fi the bandwidth will be shared amongst them which could result in the network becoming congested meaning slower speeds for everyone (1).

Accept any other suitable response.

13	Hounds R Us is a mobile pet grooming service that offers grooming services at customers' homes. A deposit is collected upon booking, while the remaining balance is paid after the appointment using chip and pin machines. Poor mobile reception in some areas forces the business to use customers' Wi-Fi to take payments, which exposes it to potential malware attacks from hackers.
(a)	**State** two **types of malware.**
	[2 marks]

AO1 = 2 marks

Award **one** mark for stating each type of malware, up to a maximum of **two** marks:

- key loggers (1)
- ransomware (1)
- spyware (1)
- viruses (1).

Accept any other suitable response.

(b)	**Using** two **examples, explain the potential impact of malware that could be installed via the customers' Wi-Fi networks.**
	[4 marks]

AO2 = 4 marks

Award **one** mark for each explanation point, up to a maximum of **two** marks per explanation:

- Key loggers – a hacker could install a key logger by booking an appointment as a customer on Hounds R Us customers' Wi-Fi (1), which would allow the hacker to record every keystroke made by the customer, which may include sensitive information that they could sell in a data breach (1).
- Ransomware – the hacker could send a crypto virus as ransomware on Hounds R Us' device when they access customers' Wi-Fi (1) and this could be used later to lock the business out of its own files until the hacker is paid a ransom (1).
- Spyware – the hacker could initiate fake software updates with an attachment that appears harmless but is spyware via public Wi-Fi (1) and gather data such as log in details, financial information or customer data including payment information for example (1).
- Viruses – a hacker could install a virus by asking the user to click to join the Wi-Fi network when in fact it is permission to install the virus (1). The virus can then delete files or send customer data to the hacker (1).

Accept any other suitable response.

14	RAHS Ltd provides outsourced human resource services to various industries, including recruitment and induction of new employees, and maintenance of employee records. As the data processor, it handles personal data for its clients, who keep control over the information and its usage.
	Assess the impact on RAHS Ltd if sensitive data is not kept confidential.
	[3 marks]

AO3 = 3 marks

Award **one** mark for each assessment point, up to a maximum of **three** marks:

- RAHS Ltd could face fines for non-compliance with data-protection laws and regulations, which would negatively impact the business finances (1). The fines may be substantial dependent on the extent of the breach, which could result in an overall loss of earnings (1). Refunds or compensation may also need to be provided to customers, which could have a further detrimental impact (1).
- RAHS Ltd's failure to keep sensitive data confidential could result in a loss of trust from clients, which may result in those clients terminating their contracts with RAHS (1). This could result in a loss of revenue / reputational damage (1). This may result in a long-term consequence where the loss of trust may result in it being difficult to attract new clients (1).
- If RAHS Ltd were to leak sensitive information it would risk a fine for breaching its responsibilities under data protections laws (1) but it could also be taken to an employment tribunal by the employee for disclosing confidential information (1). Legal consequences are also likely to have a financial component that may impact the financial stability of the company (1).

Accept any other suitable response.

15	Shady's Eyewear is an online business that offers custom made glasses and sunglasses. Customers can choose standard lenses or upload their prescription for bespoke lenses. The website has a password-protected area where customers can save personal information, such as address and payment details for future use. Assess the importance of ensuring that Shady's Eyewear is compliant with the legislation that applies when operating online. [6 marks]

AO3 = 6 marks

Award **one** mark for each assessment point, up to a maximum of **six** marks:

- It is important that Shady's Eyewear is compliant with data protection legislation as customers will want to know that their data is safe with the business (1). If Shady's Eyewear do not protect their customers' data properly then it can be fined, which can be very expensive for the business and could affect Shady's Eyewear's ability to run its business financially (1). Shady's Eyewear may need to invest more money into investigating the breach and implementing new security measures, which would be costly to the business (1). It may also result in legal liabilities such as paying damages for affected customers, which would mean further expenditure for the business (1). This would have a negative impact on the reputation of Shady's Eyewear as it would need to increase the prices of its glasses to cover the cost of the fine (1), which will mean customers will use its competitors, which will affect the survivability of the business (1).
- Ensuring that Shady's Eyewear is up to date with legislation that affects it when operating online is very important for the protection of the business and the customers' sensitive information (1). Adhering to applicable laws and regulations can protect the business from potential legal issues such as data privacy, security and complying with consumer protection law (1). It will minimise the chances of hackers trying to access sensitive information that could be used in fraudulent activity / identity theft (1). Compliance is necessary for the protection of the sensitive medical data that customers will provide as any malicious alterations due to non-compliance could result in the customer receiving incorrect care from Shady's Eyewear (1). By ensuring that this information is protected Shady's Eyewear can create a loyal customer base and attract new customers (1). Compliance will also demonstrate a commitment to ethical business practices and responsible data management, which will be important in creating a positive reputation for the business (1).

Accept any other suitable response.

16	Jenkin's Surf Supplies is a wholesale business that currently sells surf products to retailers only. However, it is moving to a new building and plans to start selling directly to the public as well.
	The new premises will have a custom-built network to meet its needs and some staff will work on-site while others will access the network remotely. The company is considering allowing both personal and business devices to access the network.
	Assess which processes and protocols Jenkin's Surf Supplies need to implement to ensure internet security assurance.
	Your response must include reasoned judgements and conclusions. [12 marks, plus 3 marks for QWC]

AO1 = 4 marks
AO2 = 4 marks
AO3 = 4 marks
QWC = 3 marks

Band	Mark	Descriptor
4	10–12	AO3 – **Justified** and **well supported** assessment of the importance of internet security assurance that exists within an organisation is **comprehensive, effective, relevant** and **shows detailed understanding** and **logical and coherent** chains of reasoning throughout. Given conclusions are informed and are fully supported with rational and balanced judgements. AO2 – Applied **all relevant knowledge** on the importance of internet security assurance that exists within an organisation relating to the context and shows a **detailed, functional** understanding of digital operational integrity. AO1 – A **wide range of relevant knowledge** and understanding of the importance of internet security assurance that exists within an organisation, which is **accurate** and **detailed**. A wide range of appropriate technical terms are used. The answer demonstrates **comprehensive** breadth and / or depth of understanding.
3	7–9	AO3 – **Mostly justified** and **supported** assessment of internet security assurance that exists within an organisation is in **most parts effective** and **mostly relevant,** showing **mostly logical** and **coherent** chains of reasoning. Given conclusions supported by judgements that consider most of the relevant arguments. AO2 – Applied **mostly relevant** knowledge of the importance of internet security assurance that exists within an organisation relating to the context, showing **mostly functional understanding** of digital operational integrity.

		AO1 – A **small range of relevant knowledge** and understanding of internet security assurance that exists within an organisation, which is **mostly accurate** and is in **most parts clear** although on occasion may lose focus. The answer demonstrates **reasonable** breadth and / or depth of understanding, with occasional inaccuracies and / or omissions.
2	4–6	AO3 – **Partially justified** and **supported** assessment of the importance of internet security assurance that exists within an organisation is in **some parts effective** and of **some relevance,** with **some understanding** and reasoning taking the form of **generic statements** with some development. Given **brief** conclusions supported by judgements that consider only the most **basic** arguments. AO2 – Applied **some, but limited knowledge** of the importance of internet security assurance that exists within an organisation relating to the context and **may show a lack of functional understanding** of digital operational integrity. AO1 – A **limited range of relevant knowledge** and understanding of the importance of internet security assurance that exists within an organisation, which is **sometimes accurate** but shows limited accuracy, focus and relevance. The answer is **basic** and shows **limited** breadth and / or depth of understanding, with inaccuracies and omissions.
1	1–3	AO3 – **Unjustified** and **unsupported** assessment of the importance of internet security assurance that exists within an organisation is **minimal** and very **limited** in effectiveness and relevance. Given **tenuous** conclusions that are unsupported and show **little relevance** to the question aims. AO2 – Applied **general** knowledge and / or **general** assertions about the importance of internet security assurance that exists within an organisation with **little relevance** to the context. AO1 – A **very limited** range of relevant knowledge and understanding of the importance of internet security assurance that exists within an organisation. **Shows very minimal accuracy, focus and relevance.** The answer has isolated points, showing very **minimal breath and / or depth** of understanding, with **significant** inaccuracies and omissions.
	0	No creditworthy material.

Indicative content

Examiners are reminded that the indicative content reflects content-related points that a student may make but it is not an exhaustive list, nor is it a model answer. Students may make all, some, or none of the points included in the indicative content as its purpose is as a guide

for the relevance and expectations of the responses. Students must be credited for any other appropriate responses.

AO1: Knowledge and understanding of the processes and protocols that prevent threats to digital systems, which may include:

- installing and configuring a firewall
- implementing network segregation
- using network monitoring
- having controls for use of removeable media
- installing and using anti-virus software
- managing the user privileges / permissions
- carrying out penetration / vulnerability testing
- using secure protocols for data transfer like SFTP
- having a VPN for remote access
- using Secure Shell (SSH) to have secure connection to devices.

AO2: Applied knowledge of processes and protocols to be used by Jenkin's Surf Supplies to ensure assurance of its internet security, which may include:

- The business has a lot of different ways in which the network is accessed and not all are on business owned devices, which leaves the business open to threats like malware.
- It is important that Jenkin's Surf Supplies sets up its new network to ensure that any personal devices accessing the network are not able to access secure information.
- Setting the network up with user permissions will also ensure that if the device is lost or left somewhere then the business's data cannot be accessed.
- On access to the network the business can limit access if for example, the personal device is using a public Wi-Fi, as this increases the chance of threats being able to be transmitted to the business's network.
- Secure transfer protocols are important for Jenkin's Surf Supplies to use to keep its commercial and customer data secure and safe so it cannot be stolen when being transferred.
- Using encryption protocols for sending and receiving all business data would also help to reduce the risk that using personal devices on its network presents, as only those with the password to access the SFTP could access the document even if the device is stolen.

AO3: Assessment of which processes and protocols need to be implemented to prevent threats to digital systems, which may include:

- One way the business can do this is to make use of authenticator technology and to make sure that each time an employee logs into the network from a personal device that they need to also enter an additional authentication code to ensure that it is them.
- Using authenticator technology will enable the business to ensure that this is a legitimate access attempt to their network, and as part of this process the business can also require that the business's access protocols are applied to the personal device for it to be used, which will help the business to limit the access non legitimate attempts might have.
- Having user permissions or using secure protocols would either refuse access to the personal device if on an unsecure network, or it could restrict the files and parts of the network the personal device is able to access to limit the risk.

- Using secure protocols like SFTP or HTTPS ensure that whenever sensitive data is transmitted, such as a customer entering their credit card details to make a purchase, that data is encrypted and so even if a hacker were to access the network and steal data it would be worthless as the data would be encrypted.
- The network could be set up so that any access from a personal device either requires an additional password to be entered, or, for more sensitive information like customer details, that this data can only be accessed on a business computer so that personal devices would not enable the user to access it, which would ensure that Jenkin's Surf Supplies limits the damage that any threat could pose as there would be multiple security features in place to protect data.

Accept any other suitable response.

QWC mark scheme

Mark	Descriptor
3	The answer is clearly expressed and well structured. The rules of grammar are used with effective control of meaning overall. A wide range of appropriate technical terms is used effectively.
2	The answer is generally clearly expressed and sufficiently structured. The rules of grammar are used with general control of meaning overall. A good range of appropriate technical terms is used effectively.
1	The answer lacks some clarity and is generally poorly structured. The rules of grammar are used with some control of meaning and any errors do not significantly hinder the overall meaning. A limited range of appropriate technical terms is used effectively.
0	There is no answer written or none of the material presented is creditworthy. **OR** The answer does not reach the threshold performance level. The answer is fragmented and unstructured. The errors in grammar severely hinder the overall meaning.

Section C: digital analysis and data

This section is worth 40 marks, plus 3 marks for QWC and use of specialist terminology.

17	**State** one **data type.**
	[1 mark]

AO1 = 1 mark

Award **one** mark for:

- numeric (1)
- text (1)
- media (1)
- geospatial (1)
- temporal (1)
- logical (1).

Accept any other suitable response.

18	**Kicks MA & J is a company that produces martial arts equipment and provides martial arts classes at four locations known as dojos.**
	It had a data loss scare when its network attached storage (NAS) drive failed, prompting it to invest in improved data storage and backup procedures to avoid a repeat of the incident.
(a)	**State** one **other method of storing data that Kicks MA & J could use to safely store its data.**
	[1 mark]

AO1 = 1 mark

Award **one** mark for:

- cloud storage (1)
- portable storage device (1)
- solid state drive (SSD) (1).

Accept any other suitable response.

(b)	**Explain** one **way the stated storage method would prevent future data loss issues for Kicks MA & J.**
	[2 marks]

AO2 = 2 marks

Award **one** mark for an explanation point, up to a maximum of **two** marks:

- Kicks MA & J would benefit from using a solid state drive (SSD) as this would allow them to back up all their data onto the drive (1). SSDs have a large storage capacity and are safer than hard disk drives (HDDs) as they have no moving parts so this would ensure that if the main hard drive fails that they could recover all their data from the SSD without needing to pay for expensive data recovery (1).
- Kicks MA & J needs to start using cloud storage to store its data as this stores data off-site from the business so if the business were to have an incident like a break-in or fire all its data would be lost (1), but with the cloud the data would be stored safely elsewhere, and Kicks MA & J can simply log in and retrieve the data (1).
- Using a portable storage device would help Kicks MA & J to prevent future data loss as they can back up all files to the portable hard drive at the end of each day (1), this could then be stored safely elsewhere so that if any data is lost, they can just plug the portable hard drive in and copy the missing data back onto the system (1).

Accept any other suitable response.

19	**A smoothie bar plans to host an online competition to promote its business. The competition will consist of a five-question multiple-choice quiz, with entrants only able to advance to the next question if they answer the current question correctly. The smoothie bar seeks to randomly select a winner and has been advised that an algorithm can accomplish this.**
(a)	**State** one **characteristic of an algorithm.**
	[1 mark]

AO1 = 1 mark

Award **one** mark for:

- clearly defined inputs / effectiveness (1)
- finiteness (1)
- iteration (1)
- logical (1)
- selection (1)
- unambiguous (1).

Accept any other suitable response.

(b)	**Describe** one **way the stated characteristic would help the smoothie bar create its promotion.**
	[2 marks]

AO2 = 2 marks

Award **one** mark for a description, up to a maximum of **two** marks:

- Clearly defined inputs – there should be clear instructions to the entrants (1) of how to enter their answers for the quiz and how the quiz works so they know how to use it and whether they have won (1).
- Finiteness – there should be a set number of questions within the quiz (1), so the entrant knows how long the quiz is, so they complete all questions and don't stop the quiz midway through (1).
- Iteration – there should be a repetition of steps until a result is achieved within the quiz (1). So each entrant will need to complete a series of steps correctly to be eligible to be included in the random selection of a winner. If entrants skip steps, they will not be able to be entered into the random selection (1).
- Logical – there should be a specific sequence to the steps of the algorithm for the quiz (1). This will mean that the quiz will need to follow the same process for all entrants and not have exceptions (1).
- Selection – the input should lead to a choice of step (1), this means that in the quiz when the entrant enters their answer, the algorithm checks if it is right, in which case it goes to next question, or, if the wrong answer is entered the entrant is returned to the beginning of the quiz (1).
- Unambiguous – there should be very clear options for the quiz contestants to pick from (1). This will ensure that the algorithm can be pre-programmed with the right answers to each question and only contestants with the correct answer will be able to progress to the next question (1).

Accept any other suitable response.

20	A computing teacher at a local school is starting to teach coding to students. She has decided that if she teaches them algorithm design first it will help the students gain a better understanding of coding. To help her students, she has created a simple algorithm that multiplies two numbers and then prints the results.
(a)	**State** two **tools that can be used for algorithm design.**
	[2 marks]

AO1 = 2 marks

Award **one** mark for each tool, up to a maximum of **two** marks:

- decomposition diagram (1)
- flowchart (1)
- pseudocode (1).

Accept any other suitable response.

(b)	**Explain** one **way that each of the tools identified in part** (a) **could help the students to understand how their algorithms work.**
	[4 marks]

AO2 = 4 marks

Award **one** mark for each explanation point, up to a maximum of **two** marks per explanation:

- Decomposition diagrams will help the students to understand how the algorithm works as they show a breakdown of the multiplication process (1), and the student can see what is happening each time a choice is made till the result is printed (1).
- Using a flowchart, the students will have a visual representation that shows them what is happening at each stage of the mathematical calculation (1) and how each choice then affects the final calculation and answer print out (1).
- Using pseudocode would give the students a plain language overview of the algorithm calculation (1) that would enable them to understand how the code will work even if they do not understand coding (1).

Accept any other suitable response.

21	**N2I Ltd is a market research company that creates customised reports for industries and businesses, using both existing and newly gathered data. It also offers personalised services to prepare reports on specific industry sectors and individual businesses, which involve collecting fresh data alongside existing information.**
(a)	**State** two **external sources of data.**
	[2 marks]

AO1 = 2 marks

Award **one** mark for stating each external source, up to a maximum of **two** marks:

- competitors (1)
- government (1)
- market research (1)
- public (1)
- repositories (1)
- sector / industry (1)
- suppliers (1).

Accept any other suitable response.

(b) **For each identified external source of data in part** (a) **explain how N2l Ltd can use these for its bespoke service reports.**

[4 marks]

AO2 = 4 marks

Award **one** mark for each explanation point, up to a maximum of **two** marks per explanation:

- Market reports such as those prepared by competitors can be used by N2l Ltd as this would give them an overview of the market behaviour (1), which it can then use to decide on more specific data it needs to collect (1).
- N2l Ltd could use a government report to gather non-biased information (1). This would give it large amounts of data like population data or inflation figures that N2l Ltd could use to help its clients understand the market (1).
- N2l Ltd could carry out new market research into the sector to gather information (1). This would enable them to ensure that their clients were getting the information they want to know about the market (1).
- N2l Ltd could use public information such as ONS statistics on things like income (1). This data would enable the clients to understand who their potential target market is and their demographics so they can price their products accordingly (1).
- N2l Ltd could access data repositories for their reports. These repositories store large amounts of data from a wide range of sources and over a larger period of time (1) so clients would be able to have a wider set of data to consider helping them make a more informed decision (1).
- N2l Ltd could use sector / industry journals as these cover a wide range of data and statistics for the sector they represent (1), this would give N2l Ltd sector specific trends and company data that they can include in their bespoke reports so their clients understand the market trends better (1).
- N2l Ltd could research the clients' potential suppliers. This would enable clients to have a good understanding of who they could buy their stock from, and the prices different suppliers are charging (1) so they can choose the best supplier for them (1).

Accept any other suitable response.

22	Apprentice2Go (A2G) provides training to businesses. Training can include short sessions and formal qualifications. It designs, delivers and assesses these programmes.
	A2G also collects and stores user data for its apprentices to ensure they are registered for the right course and receive certificates.
	Discuss the importance of A2G undertaking regular maintenance of its user data.
	Your response must include reasoned judgements and conclusions.
	[3 marks]

AO3 = 3 marks

Award **one** mark for each discussion point, up to a maximum of **three** marks:

- Maintenance will be important to ensure its user data is accurate and that former apprentice data is removed so that they no longer have access to the network once they have completed their course (1). This will ensure that unauthorised users are not able to access the course material for free, which may harm the finances of A2G (1). Prioritising maintenance to ensure accurate user data and timely removal of former apprentices' access will help A2G safeguard its finances by preventing unauthorised access to course materials (1).
- Regular maintenance of user data is crucial for A2G as it will enable A2G to identify changes in an apprentice's circumstances that may impact their eligibility for a course (1). It will also likely allow A2G to provide more relevant training programmes to meet the needs of individuals (1). In conclusion, though maintenance will be time consuming, it will be essential for identifying changes in circumstances and providing relevant training to meet needs (1).
- It would be extremely important to undertake regular maintenance to ensure that A2G user accounts have the right level of access to relevant information to ensure that the company is compliant with legislation (1). There may be regular updates to data protection and privacy regulations that will mean A2G may need to invest in time / resources to stay up to date with the changes (1). Overall, regular maintenance and updates are crucial for A2G to maintain the right level of access and compliance with data protection and privacy regulations preventing legal issues / fines (1).

Accept any other suitable response.

23	Seats Up Ltd design and manufacture airline seats, offering a range of seat types and options to meet client needs. The company recently implemented key performance indicators (KPIs) and discovered significant variability in the time required to build each seat, even within the same style. Despite attempting manual data analysis, the large and diverse data set has posed challenges for management. Discuss how machine learning algorithms could help Seats Up Ltd analyse the data it is collecting. Your response must include reasoned judgements and conclusions. [6 marks]

AO3 = 6 marks

Award **one** mark for each discussion point, up to a maximum of **six** marks:

- Seats Up Ltd has been collecting data about the different parts of the production line so it can then use machine learning to analyse and predict where problems are most likely to arise in the process (1) and it could notify the management if this issue is arising as it can be given access to the live production data (1). This would help Seats Up Ltd to identify when potential issues may occur and to be proactive in solving them (1), whereas at the minute, it will have to wait for problems to occur and react (1), which costs it time and money as the production line may stop and customers' orders may be late (1). To conclude, implementing machine learning algorithms would allow Seats Up Ltd to proactively identify and solve potential production line issues that would have time / cost savings while ensuring timely order fulfilment for customers (1).
- Using machine learning would save Seats Up Ltd money (1) as it would be able to provide the data in its current raw format to the algorithm instead of the current approach of having to standardise the data and then analyse it (1). This would save the business time as it would no longer need to pre-process the data (1) and computers are able to process data much faster than humans are (1). Using machine learning would also enable the business to highlight trends in future data and so it can respond to trends in its data in a more proactive than reactive way (1). In conclusion, implementing machine learning algorithms would enable Seats Up Ltd to save time and money by eliminating the need for manual data-pre-processing and analysis allowing for pro-active trend analysis and faster response times improving the company's profits overall (1).

Accept any other suitable response.

24		Count with Us Ltd is an accounting firm with specialised departments for different types of businesses.
		It grew by acquiring competitors and using their data systems. However, this has resulted in different departments having different ways of working; requiring retraining of staff and making it challenging to find cover for absences.
		Evaluate the importance to Count with Us Ltd of having a consistent approach to the format and storage of its data to reduce the current issues it is having.
		Your response must include reasoned judgements and conclusions.
		[12 marks, plus 3 marks for QWC]

AO1 = 4 marks
AO2 = 4 marks
AO3 = 4 marks
QWC = 3 marks

Band	Mark	Descriptor
4	10–12	AO3 – **Evaluation** of the statement against the **strengths** and **limitations** of the format and storage of data is **comprehensive**, **effective** and **relevant**, showing **detailed** understanding and **logical** and **coherent** chains of reasoning throughout. Makes **informed** conclusions that are fully supported with **rational** and **balanced** reasoned judgements. AO2 – Applied all **relevant** knowledge of the **strengths** and **limitations** of the format and storage of data and shows a **detailed** functional understanding. This is effectively linked to the scenario in the question. AO1 – A wide range of **relevant** knowledge and understanding of the types of data available is demonstrated, which is **accurate** and **detailed**. A wide range of **appropriate** technical terms is used.
3	7–9	AO3 – **Evaluation** of the statement against the **strengths** and **limitations** of the format and storage of data is in **most** parts **effective** and **mostly relevant**, showing **mostly logical** and **coherent** chains of reasoning. Given conclusions are supported by reasoned judgements that consider **most** of the **relevant** arguments. AO2 – Applied **mostly relevant** knowledge of **strengths** and **limitations** of the format and storage of data, showing **suitable** functional understanding of data collection. This is linked to the scenario in the question. AO1 – A range of **mostly relevant** knowledge and understanding of the types of data available is demonstrated, which in **most** parts **clear** and **mostly accurate**, although on occasion may lose focus.

2	4–6	AO3 – **Evaluation** of the statement against the **strengths** and **limitations** of the format and storage of data is in **some** parts **effective** and of **some relevance**, with some understanding and reasoning taking the form of generic statements with some development. Judgements are **basic** and **brief**; conclusions will have **limited rationality** and **balance**. AO2 – Applied **little** but **some** knowledge of **strengths** and **limitations** of the format and storage of data and may show a **lack** of functional understanding. AO1 – A **limited** range of **relevant** knowledge and understanding of the types of data available is demonstrated, which shows **some** but **limited accuracy**, **focus** and **relevance**.
1	1–3	AO3 – **Evaluation** of the statement against the **strengths** and **limitations** of the format and storage of data is **minimal** and **very limited** in **effectiveness** and **relevance**. Given **minimal** conclusions are supported by judgements that consider only **basic** arguments and show **little relevance** to the question aims. AO2 – Applied **minimal** knowledge of **strengths** and **limitations** of the format and storage of data, showing a **very minimal** functional understanding. AO1 – A **minimal** range of **relevant** knowledge and understanding of the types of data available is demonstrated, which shows very **minimal accuracy**, **focus** and **relevance**.
	0	No creditworthy material.

Indicative content

Examiners are reminded that the indicative content reflects content-related points that a student may make but is not an exhaustive list, nor is it a model answer. Students may make all, some or none of the points included in the indicative content, as its purpose is as a guide for the relevance and expectation of the responses. Students must be credited for any other appropriate response.

AO1: Knowledge and understanding of the factors that influence a consistent approach to the format and storage of data, which may include:

- it is cheaper to have a consistent data storage system
- it reduces errors in the data
- can reduce fraud
- easier to keep up to date
- can share data more easily
- easy to interrogate the data / query the data
- can use data to draw comparisons or conclusions.

AO2: Applied knowledge of how Count With Us Ltd can have a consistent approach to the format and storage of their data in order to reduce their current issues, which may include:

- Several different systems means that staff need to be retrained to move roles and it also means the IT team are having to be trained to maintain each different file structure, therefore time consuming and costly.
- Costing money to hire in agency staff to cover staff needing time off as they cannot simply use staff from other departments as they do not have the knowledge to use the system.
- If data is stored in several different ways, it could be misinterpreted or misreported.
- If all data was stored in the same way, an algorithm could be used to compile and present the information, which could save time.
- The reputation of the business is suffering as clients may be receiving documents from different departments in different formats and might not understand it.
- Increases the chances of errors as staff may get confused between systems.
- Increased risk of fraud or hacking as all the different systems have different data storage and so it will not be obvious if there is fraud or data is stolen.
- A more consistent file structure would make it easier for any staff in the accounting business to locate and access clients work when other staff are off work or on holiday.

AO3: Evaluation of the importance of a consistent approach to the format and storage of Count With Us Ltd's data, which may include:

- If the business had consistent systems, they would be able to save on costs as they would not have to provide all the different training or pay for agency staff, but they would also cut their expenditure further as they would not be needing to pay for multiple different accounting packages, they could just use one.
- Would also make it much easier to share files within the business as they would all follow the same consistent house style, which would also make the business more recognisable and improve their reputation.
- Consistent house style would make it easier to notice any fraud happening as they would know the document is not formatted in the correct way.
- Could lead to issues with data compliance or with reporting to agencies like HMRC, which could result in fines and clients leaving as they do not like that their business has been seen in a bad light.
- As the data is stored in a number of different ways it is not possible to use algorithms to make the business more efficient, so employees will have to manually prepare the data, which increases the time and expense.
- Increases the chance of errors during data transposition as having a lot of different systems can be confusing, and even if employees are trained to use all systems, they can still make errors, therefore having a consistent approach will reduce these transposition errors.
- A consistent file structure would make it easier to for Count with Us Ltd to produce any client records if they needed to produce them due to a subject access request (SAR) from the client.

Accept any other suitable response.

QWC mark scheme

Mark	Descriptor
3	The answer is clearly expressed and well-structured. The rules of grammar are used with effective control of meaning overall. A wide range of appropriate technical terms is used effectively.
2	The answer is generally clearly expressed and sufficiently structured. The rules of grammar are used with general control of meaning overall. A good range of appropriate technical terms is used effectively.
1	The answer lacks some clarity and is generally poorly structured. The rules of grammar are used with some control of meaning and any errors do not significantly hinder the overall meaning. A limited range of appropriate technical terms is used effectively.
0	There is no answer written or none of the material presented is creditworthy. **Or** The answer does not reach the threshold performance level. The answer is fragmented and unstructured, with inappropriate use of technical terms. The errors in grammar severely hinder the overall meaning.

Assessment objective grid

Section A
Tools and testing

Question Number	AO1	AO2	AO3	QWC	Total
1	1*				1
2	1*				1
3 (a)	1				1
3 (b)		2			2
4 (a)	1				1
4 (b)		2			2
5 (a)	2				2
5 (b)		4			4
6		2			2
7			3		3
8			3		3
Total	6	10	6		22
MIN Totals required	5 marks	7 marks	6 marks		
Kil*	2				

Section B
Legislation and security

Question Number	AO1	AO2	AO3	QWC	Total
9	1*				1
10	1*				1
11 (a)	2				2
11 (b)		2			2
12 (a)	1				1
12 (b)		4			4
13 (a)	2				2
13 (b)		4			4
14			3		3
15			6		6
16	4	4	4	3	15
Total	11	14	13	3	38+3
MIN Totals required	10 marks	14 marks	11 marks	3	

Kil*	2				

Section C
Digital analysis and data

Question Number	AO1	AO2	AO3	QWC	Total
17	1*				1
18 (a)	1				2
18 (b)		2			2
19 (a)	1				1
19 (b)		2			2
20 (a)	2				2
20 (b)		4			4
21 (a)	2				2
21 (b)		4			4
22			3		3
23			6		6
24	4	4	4	3	15
Total	11	16	13	3	40+3
MIN Totals required	10 marks	16 marks	12 marks		X
Kil*	1				

Document information