T Level Technical Qualification in Digital Support Services

Core knowledge and understanding

Paper B

Mark scheme

NCFE

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.
- When allocating marks across AOs within an individual response these should logically link and should not be from disparate points of indicative content provided in the mark scheme.
- 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 mark grids have been designed to assess students' work holistically. They consist of bands-based descriptors and indicative content.

Bands-based descriptors: Each level is made up of several descriptors 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 level 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 level, 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 focussing 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 with 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 support services sector
AO2: Apply knowledge and understanding of the digital support services sector to different situations and contexts
AO3: Analyse and evaluate information and issues related to the digital support services sector

The weightings of each AO can be found in the qualification specification.

Section A: Digital Support Services pathway   **Total for this section: 25 marks**

1	Infrastructure Technician is one job role within the digital infrastructure sector.
	State one **other job role in the digital infrastructure sector.**
	[1 mark]

AO1 = 1 mark

Award **one** mark for a correct job role in the digital infrastructure sector stated:

- service desk roles (1)
- 1st line to 4th line (1)
- network engineer (1)
- server engineer (1).

Accept all other suitable response.

2	The digital infrastructure team at a local university is recruiting for a new member of staff. The university has posted a job advert for an infrastructure technician.
	a) State one **skill that the university should include in the job advert for the infrastructure technician.**
	[1 mark]
	b) Explain why the skill identified is important for the infrastructure technician job role.
	[2 marks]

AO1 = 1 marks
AO2 = 2 marks

a) Award **one** (AO1) mark for a correctly stated skill in relation to the infrastructure technician job advert:

- analytical thinking and problem solving (1)
- using digital monitoring and diagnostic tools (1)
- communicating effectively with technical and non-technical staff (1)
- project management and planning (1)
- collaboration and working as part of a team (1)
- continuous learning, improving and upskilling (1).

b) Award **one** (AO2) mark for an explanation point of why the stated skill is important for the infrastructure technician job role, up to a maximum of **two** (AO2) marks.

For example:

- Using digital monitoring and diagnostic tools is important in the infrastructure technician role as they will need to use logging and service management systems (1 AO2) to monitor the performance of the systems to ensure that they are well maintained / identify any potential issues (1 AO2).

- Project management and planning is important in the infrastructure technician role as they will need to prioritise tasks / workload in their role (1 AO2) so that the most critical tasks are completed first to minimise disruption (1 AO2).

Accept all other suitable responses.

3	A company has just bought a second building and would like to duplicate their current network structure into the new office space. Managers and the infrastructure team are discussing the requirements of the new network using the existing system design and documentation. **Explain** one **reason why the existing system design and documentation could be used for this project.** [2 marks]

AO2 = 2 marks

Award **one mark** for each explanation point of why the existing system design and documentation could be used by the development team, up to a maximum of **two marks**.

For example:

- The system design and documentation could be used by the development team to help communicate a high-level overview of the system (1), making it something that can visualise the big picture and help with stakeholders' understanding (1).
- The system design and documentation will provide the development team a blueprint of all the elements of the system (1). This will be beneficial for the team to help them understand the full system's layout (1).
- The system design and documentation will provide clarity of system requirements and specifications before work is started (1), therefore, removing any confusion that may cause mistakes (1).

Accept all other suitable responses.

4	The digital infrastructure team is working on an energy infrastructure project, deploying new remote monitoring systems. The team has reached a project delivery milestone. A progress report must be presented by the digital infrastructure team to the internal stakeholders. **a) Identify** two **communication formats the digital infrastructure team can use to present their progress report.** [2 marks] **b) Explain why** one **of the identified communication formats would be an appropriate way for the digital infrastructure team to share their progress report.** [2 marks]

AO1 = 2 marks
AO2 = 2 marks

a) Award **one** mark (AO1) for each communication format, up to a maximum of **two** (AO1) marks.

Communication formats may include, but are not limited to:

- email (1)
- face-to-face (1)
- presentation (1).

Accept all other suitable responses.

b) Award **one** (AO2) mark for each explanation point of why one of the identified communication formats would be an appropriate way for the digital infrastructure team to share their progress report, up to a maximum of **two** (AO2) marks.

For example:

- Email would enable the digital infrastructure team to summarise all information clearly within the body of the email / add any necessary documents as an attachment (1). It would also enable them to send the information to the wider stakeholder group, so everyone receives the update at the same time (1).
- Face-to-face communication could be used to share progress verbally, which gives the opportunity for two-way communication (1). This would allow internal stakeholders to ask questions to confirm the information has been effectively shared and understood (1).
- By using a method of presentation information can be summarised in a visual format that would best suit the audience especially when sharing complicated data / the updates of the infrastructure project (1). The presentation files could be shared with any internal stakeholders who were unable to attend the update in person (1).

Accept all other suitable responses.

5	A role in helpdesk support requires staff to interact with both technical and non-technical colleagues and customers.

The job description states:

'Due to the type of work and daily activities involved, helpdesk support staff are required to have excellent written and verbal communication skills (both formal and informal) along with an enthusiasm for technology.'

a) Describe each **of the following** two **written communication methods used between the helpdesk support staff and colleagues:**

- **formal**
- **informal.**

[2 marks]

b) Explain one **reason why it is important for helpdesk support staff to have excellent verbal communication skills when dealing with customers.**

[2 marks]

AO1 = 2 marks
AO2 = 2 marks

a) Award **one** (AO1) mark for a correct description of each communication style, up to a maximum of **two** (AO1) marks.

For example:

• Formal communication means that the helpdesk support staff maintain a professional manner with colleagues and customers, with accuracy required for spelling, punctuation and grammar (1).
• Informal communication means that the helpdesk support staff do not follow a prescribed professional style and communication between colleagues and customers is more casual (1).

Accept all other suitable responses.

b) Award **one** (AO2) mark for each explanation point of why it is important for helpdesk support staff to have excellent verbal communication skills, up to a maximum of **two** (AO2) marks.

For example:

• It is important for helpdesk support staff to have excellent verbal communication skills to ensure they effectively communicate technical details with customers (1 AO2), and so that they can tailor their communication according to the customer based on their technical understanding (1 AO2).
• It is important for helpdesk support staff to have excellent verbal communication skills to ensure that they listen effectively to any issue reported by the customer (1 AO2) and are able to ask relevant follow-on questions to gain a deeper understanding of the issue (1 AO2).

Accept all other suitable responses.

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6 **Harry is a member of a digital support services team. He is offering live remote training to a client to demonstrate how to raise a new ticket for helpdesk support.**

a) Identify one **way Harry could deliver this live demonstration to his client.**

[1 mark]

b) Explain one **risk Harry must consider when using the identified way to deliver this live demonstration.**

[2 marks]

AO1 = 1 mark
AO2 = 2 marks

a) Award **one** (AO1) mark for a correctly identified way Harry could deliver the live presentation to the client:

• individual training and support (1)
• remote support (1)
• screensharing (1).

Accept all other suitable responses.

b) Award **one** (AO2) mark for each explanation point of a risk that the digital support services team must consider when delivering a live demonstration, up to a maximum of **two** marks.

For example:

- Accidental sharing of sensitive data when delivering a live demonstration through screen sharing is a risk that the digital support services team should consider (1 AO2) as this could breach General Data Protection Regulations (GDPR) if customer / client details were displayed (1 AO2).
- There could be a risk of system failure whilst demonstrating a new service through remote support (1 AO2), so the digital support services team member should consider having an alternative way of interacting with the client in case it is needed (1 AO2).

Accept all other suitable responses.

7	An IT company is responsible for managing IT infrastructures for large corporate companies. The IT company do not have an automated system in place for fault detection and rely on their clients to detect and report faults. They are exploring options for implementing a fault analysis tool for identifying problems in a more automated way. Analyse the possible issues the IT company could encounter if they choose to implement system alerts. [3 marks]

AO3 = 3 marks

Award **one** (AO3) mark for each analysis point of an issue the IT company could encounter when implementing the system alerts, up to a maximum of **three** (AO3) marks.

For example:

- There is a need for manual configuration to determine the parameters which requires resource(s) who are experts with each of the IT infrastructures they manage. (1) The IT company may face the issue that the parameters they determine when configuring the system alerts is based on the rules, metrics and parameters that can be thought of at that time, which may mean not all parameters are thought of and therefore faults/problems go undetected, and the alert is not triggered. (1) The IT company may also face issues as a result of the fact that they rely on the clients to report any faults and if the client has failed to report any issues then the IT company will be unaware of them and will not have installed a system alert for the issue which may cause further complications. (1)

Accept all other suitable responses.

8	Shock, a gaming company, stores user details as part of the sign-up process for accessing their online gaming platform. It has been reported that the data store has been corrupted. Shock has procedures in place that must be followed for external reporting of faults.
	Assess why Shock should notify customers and end users of this issue.
	[3 marks]

AO3 = 3 marks

Award **one** (AO3) mark for each assessment point of why Shock should notify customers and end users of the issue, up to a maximum of **three** (AO3) marks.

For example:

- Shock should notify the customers / end users of the data store being corrupted if there is a failure of the system which contains their personal details that could lead to the data being breached (1). Depending on the severity of the incident and the potential impact on the customer / end user, Shock should identify the customers / end users affected by the issue so that they can target them with the communication, and clearly explain the scope and severity of the issue (1). Shock has an obligation to inform customers of any potential security issues around the data so that customers can take action to protect themselves and limit any opportunities for fraudulent activities involving their personal data (1).

Accept all other suitable responses.

9	Oscar is in Year 11 and has an interest in working in digital support services, but he is not sure which specialist pathway he would like to follow.
	Explain one **route Oscar could take into a role in digital support services.**
	[2 marks]

AO2 = 2 marks

Award **one** (AO2) mark for each explanation point of one route Oscar could take into a role in digital support services, up to a maximum of **two** (AO2) marks.

For example:

- An apprenticeship will enable Oscar to be exposed to real-world and hands-on experience / working alongside qualified / experienced staff (1), giving him the opportunity to realise where his particular interests lie so that he can identify next steps towards that career goal (1).
- Further education will enable Oscar to gain a deeper understanding of the roles within digital support services through studying a vocational qualification (1), which will equip him with the knowledge and skills to progress into employment / higher education in the sector (1).

Accept all other suitable responses.

Section B: Tools and testing

Total for this section: 21 marks

10	An application is tested for vulnerability and possible entry points.
	Which one **of the following identifies this type of testing?**
	A. Black box testing
	B. Penetration testing
	C. Stress testing
	D. White box testing
	[1 mark]

AO1 = 1 mark

Award **one** (AO1) mark for identifying the correct answer.

Answer: **B** (Penetration testing)

Do not accept any other responses.

11	**State** one **use of concept testing.**
	[1 mark]

AO1 = 1 mark

Award **one** (AO1) mark for stating the correct use of concept testing.

For example:

- scoping and validating requirements (1)
- informing decisions before committing time and resources to a project (1).

Accept all other suitable responses.

12	A retailer is developing an app that will enable customers to purchase items directly from their store. The app will have a feedback function so that customers can leave reviews of the items they have purchased.
	Explain one **reason why the retailer should test the app before it is launched.**
	[2 marks]

AO2 = 2 marks

Award **one** (AO2) mark for each explanation point of why the retailer should test the app before it is launched, up to a maximum of **two** marks.

For example:

- The retailer would test the app for its functionality to make sure it is fit for purpose (1) so that they know before launch that customers can complete a transaction (1).
- The retailer would test the app to identify any faults in the programme (1) so they can debug any issues, ensuring before launch that the different elements of the app work correctly (1).

Accept all other suitable responses.

| 13 | A project manager for the software development of a weather app is using a Gantt chart to manage the delivery of the project.

There is a multi-disciplinary team working to deliver the project.

The app will be launched at a conference taking place in the summer.

Explain two **component parts that the project manager should include on the Gantt chart to manage the development of the weather app.**

[4 marks] |
|---|---|

AO2 = 4 marks

Award **one** (AO2) mark for each explanation point of a component part that should be included on the Gantt chart, up to a maximum of **two** (AO2) marks per component, up to a maximum of **four** marks.

For example:

- A milestone is a component part of the Gantt chart to help the project manager deliver the software development project, as it will show a key stage in the development of the weather app (1) and act as a signpost to help track the project against the key deliverables for each team (1).
- A time scale should be included as it will identify the overall time allocated so that the app is ready for launch in the summer (1), providing a visual marker for each phase / activity of the project so that the project manager can monitor progress (1).

Accept all other suitable responses.

| 14 | A local florist wants to increase the functionality of their website in order to interact with customers more. The florist would also like to offer customised orders on request.

The florist has asked a data analyst to analyse visitor engagement on the website. The data analyst will prepare a search analytics report to share with the florist.

Assess how the information from the search analytics report could be used by the florist.

[3 marks] |
|---|---|

AO3 = 3 marks

Award **one** (AO3) mark for each assessment point of how the information from the search analytics report could be used by the florist, up to a maximum of **three** marks.

For example:

- The report will show how customers are arriving at the florist's website, based on the search criteria they enter into their chosen search engine, and will also show where the site appears in the search listings (1). The report will show the click-through rate of traffic to the florist's website when it appears in search listings, and if customers choose to go to specific pages first or if they go straight to the homepage (1). The florist would be able to gain an understanding of how customers are finding the website and if needed could take steps such as changing the metadata of the website to improve its placement in search listings (1).

Accept all other suitable responses.

15	After a recent mobile network outage in a period of severe weather conditions, a telecommunications company wants to carry out a root cause analysis.
	a) Identify two **steps of the root cause analysis process.**
	[2 marks]
	b) Explain how one **of the identified steps could benefit the telecommunications company.**
	[2 marks]

AO1 = 2 marks
AO2 = 2 marks

a) Award **one** (AO1) mark for each identified step of the root cause analysis process, up to a maximum of **two** marks:

- define the problem (1)
- collect data relating to the problem (1)
- identify what caused the problem (1)
- prioritise the causes (1)
- identify solutions to the underlying problem (1)
- implement the change (1)
- monitor and sustain (1).

b) Award **one** (AO2) mark for each explanation point of how one of the steps identified could benefit the telecommunications company, up to a maximum of **two** marks.

For example:

- Collecting data relating to the problem, such as the outage times and duration period, would provide the telecommunications company with a clearer idea of the problem (1 AO2). This would benefit the company as it would give them a better idea of what caused the outage (1 AO2).

- Identifying solutions to the underlying problem would enable the company to plan the resource and budget they would need to put in place to address it (1AO2). This would benefit the company as they would be able to consider a long-term strategy rather than just a short-term fix (1 AO2).

Accept all other suitable responses.

16	**State** two **project management methodologies.**
	[2 marks]

AO1 = 2 marks

Award **one** (AO1) mark for each project management methodology stated, up to a maximum of **two** marks:

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

Accept all other suitable responses.

17	**A fast-food restaurant is developing a self-service ordering system. The system needs to pass customer orders to the kitchen and produce customer receipts.**
	Justify why the fast-food restaurant should use black box testing as part of their testing process.
	[4 marks]

AO3 = 4 marks

Award **one** (AO3) mark for each justification point of why the fast-food restaurant should use black box testing as part of their testing process, up to a maximum of **four** marks.

For example:

- Black box testing is used to test functionality of the system, with regards to the input and expected output. When a customer inputs their food order into the system, the testing process would observe the output generated by the system to check that it matches (1). Testing could also check that any validation rules that have been created, such as a maximum limit on items ordered, are working. It is important to test that the system checks edge cases / minimum input and maximum input to prevent any errors being made when placing customer orders that could be costly to the restaurant (1). Black box testing will not test for internal programming issues, meaning that testers without any knowledge of the system can run this part of the testing (1). If black box testing was not used, errors in the system may not be identified, meaning that orders might not be processed correctly, or receipts not issued correctly. If customer orders are processed incorrectly, this could lead to excess wastage and loss of profit for the restaurant (1).

Accept all other suitable responses.

Section C: Security and legislation

Total for this section: 38 marks, plus 3 marks for quality of written communication (QWC)

18	**Which** one **of the following legislations relates to the regulation of communication infrastructure and services?**
	A. **Computer Misuse Act 1990**
	B. **Copyright, Designs and Patents Act 1988**
	C. **Digital Economy Act 2017**
	D. **Investigatory Powers Act 2016**
	[1 mark]

AO1 = 1 mark

Award **one** (AO1) mark for identifying the correct answer.

Answer: **C** (Digital Economy Act 2017)

Do not accept any other responses.

19	**Identify the regulation that governs the safe and environmentally responsible disposal of electrical equipment.**
	[1 mark]

AO1 = 1 mark

Award **one** (AO1) mark for identifying the regulation.

• Waste Electrical and Electronic Equipment (WEEE) Directive 2013.

Do not accept any other responses.
N.B. accept correct acronyms/Act without the date.

20	**Superbytz Ltd offers online technical support to customers who have purchased a device from its store. Customer details are currently saved in a spreadsheet in a shared area.**
	Superbytz Ltd is reviewing its compliance with the General Data Protection Regulation (GDPR).
	Explain one **data security measure that Superbytz Ltd could put in place to demonstrate compliance with the General Data Protection Regulation (GDPR).**
	[2 marks]

AO2 = 2 marks

Award **one** (AO2) mark for each explanation point of how regular backups can help Superbytz demonstrate compliance with GDPR, up to a maximum of **two** (AO2) marks.

For example:

- Superbytz Ltd should put in place organisational policies / physical / technical measures when collecting, processing and storing data (1). This would mean introducing measures such as encryption when gathering customer details through an online form (1).

Accept all other suitable responses.

21	Marco is the owner of a small online fashion store; he has access to limited funds. Marco is worried that an employee has not followed the regulations that are required for ensuring the working environment is safe. Marco has asked for guidance on the consequences of non-compliance with UK and international legislation and regulations. Analyse the potential financial consequences of non-compliance with UK and international legislation and regulations that Marco should be aware of. [3 marks]

AO3 = 3 marks

Award **one** (AO3) mark for each analysis point of a potential financial consequence of non-compliance, up to a maximum of **three** (AO3) marks.

For example:

- Marco needs to ensure that all his employees are following regulations in order to protect himself and his company against potential consequences of non-compliance, which could include financial consequences in the form of fines, taxes and penalties (1). This could result in Marco's company losing business / income if he needs to temporarily stop operations / reduce his product range (1). This could have a severe impact on Marco's company as it is a small, new business with no contingency funding to absorb the loss (1).

Accept all other suitable responses.

22	NetFix4U installs network solutions for companies around the UK. The team are working on an installation for a client on a two-storey building that has no current infrastructure. The client is moving into the building in 8 weeks and the network and equipment must be fully functional and ready to use. Assess how NetFix4U should implement health and safety legislation during this network installation process. [3 marks]

AO3 = 3 marks

Award **one** (AO3) mark for each assessment point of how NetFix4U should implement health and safety legislation during this network installation process, up to a maximum of **three** (AO3) marks.

For example:

- NetFix4U should give adequate training to all their network installation staff around safe working practices, such as working at height / manual handling / working with electrical equipment, to ensure that they carry out their work in a safe manner, reducing the risk of accidents / hazards to themselves (1). As the building has no current installation, the team may need to create cabling and then to complete the testing. Staff will need the correct personal protective equipment (PPE) / tools for the job as part of ensuring that they have adequate welfare provision (1). NetFix4U should ensure that the network installation staff are properly instructed and supervised during the installation so that tasks are completed accurately and in a safe way, in accordance with health safety legislation (1).

Accept all other suitable responses.

23	**State** two **reasons why it is important to maintain confidentiality, integrity and availability (CIA).**
	[2 marks]

AO1 = 2 marks

Award **one** (AO1) mark for each correct reason stated of why it is important to maintain confidentiality, integrity and availability (CIA), up to a maximum of **two** marks:

- maintains compliance (1)
- maintains trust with internal and external stakeholders (1)
- promotes positive brand image (1)
- avoids security risks and unauthorised access (1).

Accept all other suitable responses.

24	Jack is a victim of a cyber theft and has had personal funds stolen from his bank account. After investigation, Jack realises that his banking app username and password were reused by him on a subscription site. The subscription site has recently been hacked and all subscribers' credentials were stolen.
	Jack's bank has now configured their app to use multi-factor authentication.
	a) Identify two **methods of multi-factor authentication.**
	[2 marks]
	b) Explain how one **of the multi-factor authentication methods identified can be used by Jack's bank to prevent future cyber theft incidents.**
	[2 marks]

AO1 = 2 marks
AO2 = 2 marks

a) Award **one** (AO1) mark for each identified multi-factor authentication method, up to a maximum of **two** (AO1) marks.

For example:

- a one-time passcode (1)
- fingerprint / facial recognition / biometrics (1)
- security questions (1).

Accept all other suitable responses.

b) Award **one** (AO2) mark for each explanation point of how one of the multi-factor authentication methods identified can be used by Jack's bank to prevent future cyber theft incidents, up to a maximum of **two** (AO2) marks.

For example:

- The bank could configure their banking app to require a one-time passcode, sent via SMS, for Jack to enter before providing him account access (1 AO2). This will add a level of security because access to the account would need the one-time passcode as well as Jack's username and password (1 AO2).
- The bank could support the use of biometrics / fingerprint / facial recognition through their banking app, allowing Jack to set up fingerprint / facial recognition to authorise access to his account (1 AO2). This will add a level of security because access to the account would need the biometric identification as well as Jack's username and password (1 AO2).

Accept all other suitable responses.

25	Mia is the administrator of a company and is arranging for some colleagues to travel to a conference. Mia purchased the conference tickets online and has now received an email with the subject line 'E-ticket confirmation' and it refers to an e-ticket number "555972165898". The email looks genuine, but the sender is not the events company that Mia bought the ticket from. **a) Identify the type of fraudulent activity targeting Mia.** [1 mark] **b) Explain** two **common indicators for this type of activity that would help Mia determine the authenticity of the e-ticket confirmation email.** [4 marks]

AO1 = 1 mark
AO2 = 4 marks

a) Award **one** (1) mark for identifying the type of fraudulent activity in relation to the context of the scenario, up to a maximum of **one** (1) mark.

For example:

- phishing email (1).

Accept all other suitable responses.

b) Award **one** mark for each explanation point of two common indicators of a phishing email in relation to the context of the scenario, up to a maximum of **four** marks.

For example:

* The use of unfamiliar tone, a generic greeting or no greeting are all common indicators that an email Mia has received is a phishing email and not authentic (1). Legitimate companies will usually know who the recipient is and have personal information that will allow them to provide a personal greeting (1).
* If an email Mia received contains a request for personal information, this is a common indicator that this is a phishing email and not authentic (1). A genuine ticket sales company would not request any personal information from Mia in an email, such as passwords, credit card information, etc (1).

Accept all other suitable responses.

26	A hotel chain has experienced a data loss incident. Data about guests in the hotel's loyalty-scheme has been lost, including full name, postal address, email address, and phone number. The hotel chain has been unable to recover and restore loyalty-scheme guest data as it did not have a data back-up strategy. Explain how the hotel could use incremental back-ups to prevent future data loss. [2 marks]

AO2 = 2 marks

Award **one** (AO2) mark for each explanation point of how the hotel could use incremental back-ups to prevent future data loss, up to a maximum of **two** (AO2) marks.

For example:

* The hotel chain could use incremental back-ups to prevent data loss of its loyalty guests in the future. This method provides a copy of only those guests' details that are either new or have been modified since the last back-up was taken (1). The incremental back-ups could be run on a frequent basis to ensure that any future data loss incident had minimal impact on the loyalty guest data (1).

Accept all other suitable responses.

27	An unauthorised visitor was able to access all areas of a scientific services company unescorted. Some of the company's physical assets and confidential documents were stolen. As a result, the company has since implemented a security plan. The office building now has different restricted and unrestricted security zones. Analyse the impact of physical security for the scientific services company.

	[3 marks]

AO3 = 3 marks

Award **one** (AO3) mark for each assessment point of the impact of physical security for the scientific services company, up to a maximum of **three** marks.

For example:

- Physical security can prevent unauthorised access to the scientific services company's building. This would provide security to ensure there were no unauthorised and unescorted visitors accessing that building (1) and would reduce the risk of the company experiencing any further theft or data breaches, as all visitors would need show identification / would need to sign in on arrival so that staff authorise their entry to the building (1). Introducing biometrically restricted barriers would provide greater security for the confidential scientific documents as access to particular floors or rooms of the building could be restricted to relevant staff and would require their unique identifiers, such as a fingerprint, for access (1).

Accept all other suitable responses.

28	A company provides business advice and accountancy solutions to businesses across the region. They are transitioning to become a paperless office.
	The company's aims are to:
	- reduce the amount of paper they use to improve efficiency - reduce their carbon footprint - have digital documents that are easy to store, manage, share, search, track, audit and process - ensure the business can continue in the event of any disaster that affects their physical office - apply security standards to reduce the risk of data loss.
	The company has identified a cloud-based document management system as part of their paperless office solution.
	Evaluate the document management security risks that the business will need to be aware of if they decide to implement the cloud-based document management system, considering each of the following:
	- technical and non-technical vulnerabilities that exist within the system - risk mitigation controls that can be put in place to prevent threats to the digital system.
	[12 marks plus 3 for QWC]

AO1 = 4 marks
AO2 = 4 marks
AO3 = 4 marks

Band	Mark	Descriptor
4	10–12	AO3 – Evaluation of digital vulnerability mitigation is **comprehensive**, **effective** and **relevant**, showing **detailed** understanding and **logical** and **coherent** chains of reasoning throughout. The answer demonstrates informed conclusions that are fully supported with rational and balanced judgements. AO2 – Applied all relevant knowledge of security vulnerabilities and their impacts to the context given and shows a **detailed** functional understanding of digital security. AO1 – A **wide range** of relevant knowledge and understanding of digital security and critical bugs, which is **accurate** and **detailed**. The answer demonstrates **comprehensive** breadth and / or depth of understanding.
3	7–9	AO3 – Evaluation of digital vulnerability mitigation is **in most parts effective** and **mostly relevant**, showing **mostly logical** and **coherent** chains of reasoning. Given conclusions are supported by judgements that consider most of the relevant arguments. AO2 – Applied mostly relevant knowledge of vulnerabilities, impacts of vulnerabilities and mitigation components to the context, showing **some** functional understanding of digital security. AO1 – Knowledge and understanding of digital security and critical bugs is **in most parts clear** and **mostly accurate**, 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 – Evaluation of digital vulnerability mitigation 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 are supported by judgements that consider only the most basic arguments. AO2 – Applied some but limited knowledge of vulnerability, impacts of vulnerabilities and mitigation components to the context and may show a lack of functional understanding of digital security. AO1 – Knowledge and understanding of digital security and critical bugs show **some** but **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 – Evaluation of digital vulnerability mitigation 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 vulnerability, impacts of vulnerabilities and mitigation components with little relevance to the context. AO1 – Knowledge and understanding of digital security and critical bugs 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.

Quality of written communication (QWC) = 3 marks

Band	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 are 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 are 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 are 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.

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:

Responses may include, but are not limited to, technical and non-technical vulnerabilities that the business will need to be aware of:

- technical:
  - inadequate encryption (for example, weak or outdated)
  - out of date software, hardware or firmware
  - software no longer supported by supplier
  - compatibility of legacy systems
  - fail-open electronic locks
  - weak passwords (for example, default passwords)
  - missing authentication and authorisation
  - exploitable bugs / zero-day bugs
- non-technical (as per spec):

- o employees:
  - not following policies and procedures
  - competency levels of staff
  - lack of recruitment screening
  - poor data / cyber hygiene (for example, not archiving dormant staff accounts and access)
- o physical access controls:
  - inadequate security procedures
  - door access codes not changed regularly
  - using simple access codes and reusing access codes (for example, 1234)
  - no monitoring of access to secure areas
- o unnecessary staff access to secure areas.

Accept all other suitable responses.

AO2: Application / impacts of vulnerabilities:

- The potential impact to the company of having an access control vulnerability is that a cyber attacker could manipulate privileges and result in the cloud-based document management system being compromised with the company's stored data being breached and / or stolen. The company is at risk of non-malicious attacks that could potentially impact them through the accidental exposure or deletion of confidential customer information, intellectual property and money by its employees that is being stored on the cloud-based document management system.

AO3: Evaluation / mitigations:

- The company can put in place policies and procedures to potentially mitigate the access control vulnerability, to help them increase their security and prevent data breach threats. Having policies and procedures in place that give only authorised individuals access to their cloud-based document management system, coupled with multi-factor authentication, will increase the company's document security and reduce the risk of unauthorised access to their data.
- The company can provide training to all users of the cloud-based document management system to mitigate their vulnerability of non-malicious attacks. This will help the company reduce security risks, as all of system's users will be trained to in how to protect the company's data and systems. Users will also know best practice for important security protocols.

Accept all other suitable responses.

Section D: Data and digital analysis

Total for this section: 41 marks, plus 3 marks for quality of written communication (QWC)

29	Define the decomposition process of computational thinking.
	[1 mark]

AO1 = 1 mark

Award **one** (AO1) mark for an accurate definition of the decomposition process of computational thinking.

For example:

• The decomposition process of computational thinking is when large problems are broken down into small components (1).

Accept all other suitable responses.

30	As part of Chloe's continuous professional development, she is learning about algorithms. She has started an online course to support her learning.
	Chloe is looking at an example algorithm as part of her learning activities. It is a simple online calculator into which a user can enter two numbers that are then multiplied and the result displayed on-screen to the user.
	Explain two **characteristics of algorithms that are evidenced in the example Chloe has been looking at.**
	[4 marks]

AO2 = 4 marks

Award **one (AO2) mark** for each explanation point of characteristics of algorithms that are evidenced in the example Chloe is looking at, up to a maximum of **four marks**.

For example:

• The input characteristic of an algorithm means the calculator can accept clearly defined inputs, such as the numbers from zero or above (1). In Chloe's example, this is applied to the online calculator as users can input two numbers so that the calculated result can be shown on-screen (1).
• The unambiguous characteristic of algorithms can be seen in this example as the steps to input two numbers, which are then multiplied, is clear (1). This calculation has one meaning that will lead to the output being displayed on the calculator screen (1).

Accept all other suitable responses.

31	A business has a set of digital transformation goals, including improving customer experience. The data analytics team is driving improvement initiatives to help the business achieve its goals. This involves the team undertaking digital analysis of data and analytics from several sources. a) **Identify** two **applications of algorithms for digital analysis.** [2 marks] b) **Explain how** one **of the identified applications of algorithms for digital analysis could support the data analytics team to drive improvement.** [2 marks]

AO1 = 2 marks
AO2 = 2 marks

a) Award **one** (AO1) mark for each identified application of algorithms for digital analysis, up to a maximum of **two** marks.

For example:

- automate calculations to improve the efficiency of a process (1)
- design a step-by-step solution to solve a problem (1)
- supports machine-learning for data analysis (1).

Accept all other suitable responses.

b) Award **one** (AO2) mark for each explanation point of how one of the identified applications of algorithms for digital analysis could support the data analytics team to drive improvements, up to a maximum of **two** marks.

For example:

- The business could use automated calculations to improve the efficiency of a process and provide information more swiftly or for self service (1 AO2) this would allow customers to self serve and reduce the time it takes for customers to find out information and improving satisfaction (1 AO2)
- The business could design a step-by-step solution to solve a problem which would allow swift action for any issues and reduce the need for colleagues to investigate (1 AO2) this would allow staff to spend time supporting customers or reduce business costs which can be passed onto the customer (1 AO2)
- The business could use machine learning to gather social / historical / behavioural data that would allow them to gain a better understanding of their customers (1 AO2). This would help drive improvement of their customer experience as they would be able to anticipate customer behaviour, therefore, ensuring their product / service meets / exceeds expectations (1 AO2).

Accept all other suitable responses.

32	Biometric Bright create solutions for the workplace. A manufacturing company has asked them to implement a biometric employee timecard. This will replace the company's current manual process. Assess how pseudo code could be used by Biometric Bright to design a solution for the manufacturing company. [3 marks]

AO3 = 3 marks

Award **one** (AO3) mark for each assessment point of how pseudo code could be used by Biometric Bright to design a solution for the manufacturing company, up to a maximum of **three** (AO3) marks.

For example:

- Biometric Bright would use pseudo code to outline the step-by-step process of the system requirements, such as monitoring the attendance of employees at the manufacturing company by recording their entry and exit times at the workplace. (1) Non-technical staff could be involved in designing a solution as the managers could share the high-level requirements of the solution and this would be written as pseudo code before being passed to the developers (1). Developers would then be able to break down the pseudo code into the programming constructs, which would form the solution (1).

Accept all other suitable responses.

33	Noah is improving the security at his office by increasing control over who has access to the premises. He has installed an electronic code-operated door lock that requires a valid code to enter the building outside of business hours. Assess how the action of iteration will improve security in relation to the electronic code-operated door lock Noah has installed. [3 marks]

AO3 = 3 marks

Award **one** (AO3) mark for each assessment point of how the action of iteration will improve security in relation to the electronic code-operated door lock Noah has installed, up to a maximum of **three** (AO3) marks.

For example:

- Iteration would be used to validate the code being input to the electronic lock system by repeating the condition until it is met (1). This will allow Noah to set security permissions to only accept valid codes that he has identified for use outside of business hours (1), which would restrict all other unauthorised access to the premises and display an incorrect code message whilst the door remains locked (1).

Accept all other suitable responses.

34	Miles Tees designs, prints and delivers personalised gifts. Customers place orders using an online form. They can choose from a variety of messages and images, or they can upload their own.
	a) State two **data types that could appear on an online order form.**
	[2 marks]
	b) Explain how one **of the stated data types could be used by Miles Tees when creating or delivering personalised gifts.**
	[2 marks]

AO1 = 2 marks
AO2 = 2 marks

a) Award **one** (AO1) mark for each correct data type stated, up to a maximum of **two (AO1)** marks:

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

b) Award **one** (AO2) mark for each explanation point of how one of the stated data types could be used by Miles Tees when creating or delivering personalised gifts, up to a maximum of **two (AO2) marks.**

For example:

- A media data type could be used where customers would like to personalise their gifts with their own image / an uploaded image / an image from a selection provided by Miles Tees (1 AO2). This would allow Miles Tees to store images in their database against a customer order to enable them to complete the order (1 AO2).
- A text data type could be used to store a string of characters that the customer would like added to their personalised gift (1 AO2). This would allow Miles Tees to set a limit on the number of characters, which can be used within the message as appropriate for the item being ordered (1 AO2).

Accept all other suitable responses.

35	Madris is a digital media company. They are gathering customers' feedback on their brand and products using a range of methods.
	Madris is going to use data gathered to inform their future strategic decisions for change.
	Assess how customer feedback could help Madris inform future strategic decisions.
	[4 marks]

AO3 = 4 marks

Award **one** (AO3) mark for each assessment point on how customer feedback could help Madris inform future strategic decisions, up to a maximum of **four** (AO3) marks.

For example:

- By receiving customer feedback, Madris can gain more insight and identify areas of opportunity. Putting the voice of their customers at the heart of any future strategic changes may positively impact them as customers will feel listened to, which could result in Madris gaining a competitive edge (1). Customer feedback will allow Madris to analyse previous and current trends and patterns, which could help them by providing an understanding of what customers want, therefore, minimising the risk of future strategic changes that they have not validated with their customers (1). Madris can also use customer feedback to gain opinions of products / services. This could help to inform any future product / service launch, or to make improvements to products / services, ensuring their market success (1). Madris can gain a sense for what makes their existing customers happy, and if they are or not. This can positively impact them and their customer retention by making future changes to ensure loyalty and customer satisfaction (1).

Accept all other suitable responses.

36	A member of staff wants to present a set of slides for a presentation to an external stakeholder. However, they do not have the appropriate level of access to read and modify the slides. They have contacted the system administrator and asked for permission to be granted.
	The system administrator is reviewing access permissions and controls whilst observing the company's information security management practices to protect data and ensure confidentiality.
	a) **State** two **access control methods that the system administrator should consider.**
	[2 marks]
	b) **Explain how** each **of these** two **access control methods could provide the appropriate level of access to the member of staff.**
	[4 marks]

AO1 = 2 marks
AO2 = 4 marks

a) Award **one** (AO1) mark for an access control method stated that the system administrator should consider, up to a maximum of **two** (AO1) marks:

- role-based access control / RBAC (1)
- attribute-based access control / ABAC (1)
- mandatory access control / MAC (1)
- discretionary access control / DAC (1).

b) Award **one** (AO2) mark for each explanation point of how each of these two access control methods could provide the appropriate level of access to the member of staff, up to a maximum of **four** (AO2) marks.

For example:

- RBAC restricts or allows access to the slides based on the role of the member of staff, so to access the slides the member of staff will need to be grouped into a role that would allow them to do so (1 AO2), but they would still be unable to access any files outside of the permissions set for that group (1 AO2).
- DAC restricts or allows the member of staff access to the slides based on the resource owner's preference, which means that shared permissions can be granted as required (1 AO2). Access to the slides for the member of staff could be authorised based on the circumstances and removed when no longer needed / as appropriate. (1 AO2)

Accept all other suitable responses.

37	A local council is putting together a marketing campaign around online safety. The campaign will be aimed at teenagers and the council wants to make sure that the information is presented in a creative and engaging way.
	The marketing campaign needs to share several important messages around how to stay safe online and the local council wants to reach as many teenagers as possible.
	Discuss the methods of presenting data that will engage the target audience, whilst also delivering a clear message about online safety.
	• **Your response must include reasoned judgements.**
	[12 marks plus 3 for QWC]

AO1 = 4 marks
AO2 = 4 marks
AO3 = 4 marks

Band	Mark	Descriptor
4	10–12	AO3 – Discussion of the methods of presenting data that will engage the target audience is **comprehensive**, **effective** and **relevant**, showing **detailed** understanding and **logical** and **coherent** chains of reasoning throughout and is fully supported with rational and balanced judgements.

		AO2 – Applied all relevant knowledge of the methods of presenting data that will engage the target audience to the context and showed a **detailed** functional understanding of validation and verification. AO1 – A **wide range** of relevant knowledge and understanding of the methods of presenting data that will engage the target audience, 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 – Discussion of the methods of presenting data that will engage the target audience is **in most parts effective** and **mostly relevant**, showing **mostly logical** and **coherent** chains of reasoning, and is supported by judgements that consider most of the relevant arguments. AO2 – Applied mostly relevant knowledge of the methods of presenting data that will engage the target audience to the context, showing **some** functional understanding of validation and verification. AO1 – Knowledge and understanding of the methods of presenting data that will engage the target audience **is in most parts clear** and **mostly accurate**, 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 – Discussion of the methods of presenting data that will engage the target audience in **some parts effective** and of **some relevance**, with some understanding and reasoning taking the form of **generic statements** with some development. Given judgements consider only the most basic arguments. AO2 – Applied some but limited knowledge of the methods of presenting data that will engage the target audience to the context and may show a lack of functional understanding of validation and verification. AO1 – Knowledge and understanding of the methods of presenting data that will engage the target audience show **some** but **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 – Discussion of the methods of presenting data that will engage the target audience is **minimal** and **very limited** in effectiveness and relevance. Given judgements show little relevance to the question aims. AO2 – Applied general knowledge and / or general assertions about the methods of presenting data that will engage the target audience with little relevance to the context. AO1 – Knowledge and understanding of the methods of presenting data that will engage the target audience 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.

Quality of written communication (QWC) = 3 marks

Band	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 are 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 are used effectively.
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Indicative content

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AO1: Knowledge:

Responses may include but are not limited to:

Methods of presenting data:

- reports – structured text that contains detailed information in a written format
- digital slides – a combination of text, images and interactive content added to slides to present information digitally
- webinars – used to present information to participants in different locations via the internet
- XR / VR / AR – combines a digital world with reality allowing interaction between the two
- video – a recording of moving visual images that can incorporate sound, saved digitally
- sound – using voice to share a message that can be heard
- animation – using models / drawings to create an illusion of movement when captured by a camera / computer and presented in a sequence.

Suitability for application:

- formal or informal – language and layout need to be considered

- meeting requirements – consideration of the brief, the audience and level of technical knowledge.

AO2: Application / methods:

As the target audience for this marketing campaign is teenagers, video could be used to combine the important elements of online safety in an accessible way that is engaging as it could combine text, sound and imagery to get the message across. As the marketing campaign must contain several important messages about staying safe online, the video could be used within a classroom environment as a teaching resource to raise awareness of online safety with teenagers. If the content was presented in shorter videos, it could be hosted on social media platforms, which this audience may already be familiar with and, therefore, are more likely to see the campaign.

AO3: Discussion / effectiveness:

The marketing campaign would need to consider the target audience and how they are most likely to access the information being presented. As the topic is online safety it will contain several important / key messages that need to be presented in a structured way. To be engaging, the marketing campaign would need to capture and hold the attention of the teenagers, which could be done by using a variety of presentation methods, such as video / animation / XR / digital slides. These methods would allow the key messages to be shared in short clips that could be accessed via social media platforms. Presenting content in this way would enable teenagers to quickly see the message as they scroll through various content. This would also allow the content to be shared easily, which would maximise the reach of the marketing campaign. If the marketing campaign is presented in a longer format, such as an information video, it could be used as a teaching resource, which would allow further engagement through follow-up activities relating to the content that has been watched.

Accept all other suitable responses.

Assessment Objective Grid

Question	AO1	AO2	AO3	QWC	Total
1	1				1
2	1	2			3
3		2			2
4	2	2			4
5	2	2			4
6	1	2			3
7			3		3
8			3		3
9		2			2
10	1				1
11	1				1
12		2			2
13		4			4
14			3		3
15	2	2			4
16	2				2
17			4		4
18	1				1
19	1				1
20		2			2
21			3		3
22			3		3
23	2				2
24	2	2			4
25	1	4			5
26		2			2
27			3		3
28	4	4	4	3	15
29	1				1
30		4			4
31	2	2			4
32			3		3
33			3		3
34	2	2			4
35			4		4
36	2	4			6
37	4	4	4	3	15
Total	35	50	40	6	131

Document information

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