T Level Technical Qualification in Digital Support Services

Core knowledge and understanding

Paper A

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 objective(s) 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 0 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 assessment objectives (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 band-based descriptors and indicative content.

Band-based descriptors: each band is made up of several descriptors for across the AO range (AO1-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 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 assessment objectives, 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 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: Business context and culture   **Total for this section: [40 marks]**
                                                [plus 3 marks for QWC]

1	**Identify** two **types of hacker.**
	[2 marks]

AO1 = 2 marks

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

- white hat / ethical hacker (1)
- grey hat (1)
- black hat (1).

Accept any other suitable response.

2	**Identify** two **potential impacts of increased reliance on digital technology on society.**
	[2 marks]

AO1 = 2 marks

Award **one** (AO1) mark, up to a maximum of **two** (AO2) marks.

- loss of privacy (1)
- changing behaviours (1)
- communication access (1)

Accept any other suitable response.

3	Isaac has been hired to deliver training to human resource managers. The training is aimed at enabling human resource managers to better support their staff in the use of digital technology by offering information about reporting mechanisms and how to request support. The main focus is on mitigation techniques that can reduce the impact of unsafe or inappropriate use of digital technology.
	a) Identify one **mitigation technique Isaac could cover.**
	[1 mark]
	b) Explain one **impact this mitigation technique could have on the staff which managers interact with.**
	[2 marks]

AO1 = 1 mark
AO2 = 2 marks

a) Award **one** (AO1) mark for identification of a mitigation technique:

* regulate use of digital technology (1)
* report misuse to relevant authority (1)
* display screen equipment / DSE (1)
* workstation assessment (1)

Accept any other suitable response.

b) Award **one** (AO2) mark, up to a maximum of **two** marks.

* human resource managers could introduce policies and procedures that support the regulated use of digital technologies (1). To ensure staff are aware of this mandatory staff development sessions could be introduced to raise awareness of them and ensure staff comply with them (1)
* encouraging human resource managers to make staff aware of who they should report misuses of technology could reduce the likelihood of misuse occurring (1). Users would not experience such issues as frequently, improving the experience of those using them (1)
* if human resource managers are aware of the need to take regular breaks when using display screen equipment, they can make sure controls are in place to support this (1). They also need to ensure that line managers are aware of workstation checks and that they support employees in completing these (1)
* if human resource managers are aware of the importance of workstation assessment, then they can ensure that other people who line manage staff are checking that they happen (1). These assessments play a vital role in staff being safe and comfortable in their workplace (1).

Accept any other suitable response.

4	**A company is moving several business processes to the cloud. Feedback from a focus group of customers included concerns about risks that might affect them. The most common areas of risk highlighted by the focus group were:** • **loss of privacy** • **non-compliance.** **a) Describe** each **of the risks highlighted by the focus group.** [2 marks] **b) Explain the potential impact of** one **of these risks.** [2 marks]

AO1 = 2 marks

AO2 = 2 marks

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

- a loss of privacy is a concern for any customer as they must be confident that personal data and business information is always protected (1)
- non-compliance is when a rule or law is not followed which may be a concern for customers as their data is moved to the cloud (1).

Accept any other suitable response.

b) Award **one** (AO2) mark, up to a maximum of **two** marks.

- loss of privacy could result in customer data being leaked (1). This could lead to reputational damage to the company as customers and potential customers may view the solution as being insecure (1).
- non-compliance could impact the company in several negative ways if it is found that their product does not comply with regulations. impacts may include being subject to lawsuits from customers (1) and if proven correct would likely be subject to large fines from the industry regulator (1).

Accept any other suitable response.

5	A marketing agency has employed several young people on an internship. The interns will be required to write blog articles for the agency website. It is likely that marketing interns would work at their computer for long periods to complete their work tasks.
	The marketing agency are planning for the induction of the interns and will include a session on the impact of unsafe or inappropriate use of digital technology.
	Explain one **way that unsafe or inappropriate use of digital technology could impact the marketing interns.**
	[2 marks]

AO2 = 2 marks

Award **one** (AO2) mark for **each** explanation point, up to a maximum of **two** marks.

- spending long times working at a PC could impact on the posture of the interns (1). These postural issues could lead to long-term back problems (1)
- spending long time periods working can have psychological impacts, such as stress (1). Interns should be given advice on how to 'step away' from their work to reduce the likelihood of this impact (1).

Accept any other suitable response.

6	Lily runs a business which offers cloud-based storage solutions to customers. A recent change in law has meant that personal information stored must be processed locally rather than in the cloud. To adapt to this change in law, Lily's business must introduce a new system. **Explain** one **step Lily could take in planning to respond to the change effectively.**
	[2 marks]

AO2 = 2 marks

Award **one** (AO2) mark, up to a maximum of **two** (AO2) marks.

- Lily could share information about the changes in law and the need for a new system with the stakeholders (1). This would help them to understand any changes that will be made and any impacts these changes could have (1)
- Lily must know when the change in law takes effect so that she can set appropriate timescales to make the required changes (1). Not setting adequate timescales could cause potential harm to Lily's business as it could be fined for not being compliant with the changes in law (1)
- Lily would need to identify and purchase resources that would allow her business to comply with this new change in law (1). The new system would need to allow on-premises resources to communicate with cloud-based resources in a hybrid cloud system (1).

Accept any other suitable response.

7	Olawale runs an IT support services business that offers technical support to small and medium enterprises. He is now looking to grow the business and would like to add some larger organisations to his customer base. Before planning how the business can support larger organisations, Olawale would like to better understand the key factors which can influence the business environment. **Explain why Olawale should consider** each **of the following key factors:** • **economic factors** • **legal factors.**
	[4 marks]

AO2 = 4 marks

Award **one** (AO2) mark, up to a maximum of **four** (AO2) marks.

- Olawale should consider economic factors such as customer trends as these may differ between small to medium companies and larger enterprises (1). This could impact on the

technical support requirements needed and the skills required from the IT support business (1)

- legal factors should be considered by Olawale as there may be different legal and regulatory requirements for small and medium companies (1) Olawale must make sure that any IT support services offered to these organisations will be fully compliant before growing his customer base (1).

Accept any other suitable response.

8	Mehwish is the owner of a large sports retail store. She is due to complete the purchase of an international sports brand with the aim of growing the retail store internationally. Mehwish is planning how to manage the change that will come with the purchase of the sports brand. She would like to make sure existing staff feel up to date with the new business structure. Discuss how Mehwish could manage the impact on staff during the growth of the business. Your response must include reasoned judgements and conclusions. [3 marks]

AO3 = 3 marks

Award **one** (AO3) mark, up to a maximum of **three** (AO3) marks.

- Mehwish could regularly update staff, through either a weekly newsletter or meeting, of any changes that are planned to take place (1). This would mean that staff are more confident in the management of the process and will help them understand the reasons for the changes (1). This would result in the changes being implemented without any disruption from staff and better supported from all (1).
- Mehwish could set up a central information hub where staff can access updates on the changes that are planned to take place (1) This would mean staff have constant access to up to date information and can review it when they have any questions (1) this would mean staff feel the change is transparent and clear (1)

Accept any other suitable response.

9	A large organisation is planning a major change to their business operation. This change will primarily focus on the replacement of their customer relationship management (CRM) system used throughout the sales and operations process. The project manager would like to ensure that the change in system does not impact negatively on the organisation. She would like to run a workshop on components of technical change management that focuses on: • **the importance of understanding the risks of making such a change** • **the purpose of the change advisory board.**

> **Assess why it is important to consider** each **component of technical change management when making such a major change.**
>
> [6 marks]

AO3 = 6 marks

Award **two** (AO3) marks, up to a maximum of **six** (AO3) marks.

- as the project is such a major one there are likely to be a number of risks associated with the change in CRM system (1). Having people in place to identify risks associated with this project would give the best chance of them being mitigated (1). Mitigation planning would allow the organisation to take steps to limit any negative impacts (1)
- it is important that the change risks are identified and understood as there are chances that these could impact on how the CRM is being used and business operations (1). Having the risks identified will allow the advisory board to make an informed decision on if the change is needed and the impact this will have on the organisation (1). If the change is required, then by identifying the risk a suitable mitigation technique can also be explored ensuring that suitable measures are in place (1)
- a change advisory board is used to review, prioritise and monitor changes that are made to business processes and systems such as replacing an important CRM system (1). The board is normally made up of experienced employees who can provide feedback on suggested changes (1) and their input can help ensure that changes are successful and avoid issues (1)
- the change advisory board is made up from a panel consisting of impacted employees across different departments, IT management (1). By having so many different members on the panel it ensures that any changes that do come to the board can be considered by senior management and all departments so that the panel can gain a better understanding of the impact of the change (1). The board will assess the change, accept or reject the change and then schedule and review it (1)

Accept any other suitable response.

10	**Emily runs a boutique bakery in London. Her business was recently featured in a popular magazine and is now experiencing a very high demand. Emily does not want to open another physical store, so she plans to digitalise her business.**
	Evaluate how digitalisation could add value to Emily's business.
	Your response must include reasoned judgements and conclusions.
	[12 marks, plus 3 marks for QWC]

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

Band	Marks	Descriptor
4	10–12	**AO3** Evaluation of how digitalisation could add value to Emily's business 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 ways that Emily can digitalise the business environment and shows a **detailed** functional understanding of the measurable value they may provide. **AO1** A **wide range** of **relevant** knowledge and understanding of ways that Emily can digitalise the business environment and measurable value they may provide is **accurate** and **detailed**. The answer demonstrates **comprehensive** breadth and/or depth of understanding.
3	7–9	**AO3** Evaluation of how digitalisation could add value to Emily's business is **in most parts effective** and **mostly relevant**, showing **mostly logical** and **coherent** chains of reasoning throughout. Given conclusions are fully supported by judgements that consider most of the relevant arguments. **AO2** Applied **mostly relevant** knowledge of ways that Emily can digitalise the business environment related to the context showing **mostly** functional understanding of measurable value they may provide. **AO1** Knowledge and understanding of ways that Emily can digitalise the business environment and the measurable value they may provide is **in most part 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 how digitalisation could add value to Emily's business is in **some parts effective** and of **some relevance**, with **limited**

		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 ways that Emily can digitalise the business environment related to the context may show a lack of functional understanding of measurable value they may provide. **AO1** Knowledge and understanding of factors that can influence the business environment and the measurable value they may provide 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 how digitalisation could add value to Emily's business 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 of ways that Emily can digitalise the business environment and the measurable value they may provide but with little relevance to the context. **AO1** Knowledge and understanding of ways that Emily can digitalise the business environment and the measurable value they may provide shows very **minimal** accuracy, focus and relevance. The answer has **isolated** points, showing **very minimal** breadth and/or depth of understanding, with **significant** inaccuracies and omissions.
	0	No creditworthy material

Quality of written communication (QWC) = 3 marks

Marks	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. 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 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: The student will evidence knowledge and understanding of the ways that digitalisation could add value to Emily's business, including:

Sales and marketing:
- enhanced market research
- increased opportunities for brand promotion
- increased communication and coverage via social media
- online opportunities for selling/e-commerce
- tracking and management of customer/service-user retention
- digital analytics (for example, customer satisfaction scores)

Operations:
- enhanced communication channels
- automation of internal systems
- remote working functionality

Finance:
- increased fiscal performance
- increased reporting options and functionality
- reduced operating costs

Key performance indicators (KPIs):
- easier to monitor

AO2: The student will apply general knowledge of the ways that digitalisation could add value to Emily's business relating to the context

and

AO3: The student will evidence evaluation of the ways that digitalisation could add value to Emily's business to include chains of reasoning:

Emily could use digital marketing tools to increase the opportunities for brand promotion. This could be done by joining social networks, such as Instagram or Twitter, and posting regular pictures of her products and customer reviews. Emily could then track metrics, such as

engagement or impressions, to see how well her social networking channels are performing. This could help identify that the bakery has a growing audience and reputation and could lead to further opportunities for the business.

Emily could utilise automated systems, such as inventory management systems that would allow for the automation of ordering of supplies. This could be linked to online and in-store orders to ensure that the business always has the right level of stock required. Emily would then always be aware of the materials that she needs to order and those that she might have a surplus of, allowing for large savings to be made.

Emily could use digital finance tools to manage the finances of the organisation. This could allow for a better understanding of the financial situation of the business as systems would always be up to date. Emily could then be confident of the cash flow of the business when considering orders and materials allowing her better control of the business.

Emily could use digital tools to track the performance of the business in terms of whether it is meeting its targets. These key performance indicators may relate to staff performance or the performance of particular products. The digitalisation of this would allow for KPIs to be more easily tracked. This could ensure that Emily can make decisions quicker based on the data she has relating to these performance indicators.

Section B: Diversity, inclusion and digital environments   **Total for this section: [40 marks]**
[plus 3 marks for QWC]

11	**Describe** two **benefits of cloud computing.**
	[2 marks]

AO1 = 2 marks

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

- the elasticity of cloud computing allows for services that can be scaled to meet changing demand (1)
- there is no limit on storage when implementing the cloud as additional storage can be allocated when a system requires it (1).
- there are cost savings associated with cloud computing as you don't need physical systems such as servers and storage (1)
- cloud providers may offer better security as they need to update their systems regularly and continually monitor for threats while making regular backups (1)

Accept any other suitable response.

12	**Identify** two **benefits of diversity and inclusion to businesses.**
	[2 marks]

AO1 = 2 marks

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

- more innovative products (1)
- greater appeal to potential employees (1)
- inclusive products (1)
- ability to connect authentically to ethnic minority groups (1)
- reduce risk of reputational damage from non-inclusive products (1).

Accept any other suitable response.

13	Callum runs an IT consultancy business. He is delivering a talk to small businesses offering online financial advice. He will cover the importance of storing data securely online and the benefits this can offer to organisations. **Explain** one **reason why storing data securely is important for the business to which Callum is delivering.** [2 marks]

AO2 = 2 marks

Award **one** (AO2) mark, up to a maximum of **two** (AO2) marks.

- As Callum is advising business that deal with financial data it is important, they know that their data cannot be accessed by unknown parties (1). If data is not stored securely these businesses could suffer from a damaged reputation or even financial penalties (1)
- As Callum is advising a business that offers online financial advice, he need to make sure that he is advising on storing any data that clients input through web-based services as this information could be intercepted or hacked (1). If data is not stored correctly resulting in it being stolen, or lost, then it could result in reputational damage or fines (1).

Accept any other suitable response.

14	George is building a new computer to play video games and to edit high-definition video. He is currently planning the build of the new computer and has reached out for advice on the following components: - **graphics processor unit (GPU)** - **fans.** **a) Describe the role of** each **of the components named above within a computer system.** [2 marks] **b) Explain how important** one **of these components would be in George's new computer.** [2 marks]

AO1 = 2 marks
AO2 = 2 marks

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

- the graphics processing unit (GPU) is used to render 3D graphics in a computer system (1)
- fans are used to help cool the computer (1).

b) Award **one** (AO2) mark, up to a maximum of **two** (AO2) marks.

- the graphics processing unit (GPU) will be extremely important in George's computer as it will determine whether the computer is able to play modern games (1). An underpowered GPU would hinder the performance of the computer when George is playing games (1)
- fans are essential as George plans to use the computer for gaming and video editing which require intensive processing (1). This leads to hot components, so it is important that George includes enough fans in his computer to keep the system cool (1).

Accept any other suitable response.

15	Milena is running a workshop at her local university on the positive impact that digital inclusion can have. The attendees of the workshop will be students that are looking to go into digital careers.
	Explain what she could include in the workshop to promote how each of the following are positive impacts of digital inclusion:
	increased career opportunities **enhanced access and connectivity to digital technology.**
	[4 marks]

AO2 = 4 marks

Award **one** (AO2) mark, up to a maximum of **four** (AO2) marks.

- Milena could explain to the attendees that digital inclusion can lead to increased career opportunities. This is because many careers require the use of digital tools and applications (1), and so being more comfortable with these will open up more opportunities (1)
- Milena could promote a wide range of career opportunities that are available but include a requirement to use digital applications and tools (1). This would allow the students to see how digital skills are essential for working in many different digital roles in addition to other sectors (1)
- Milena could promote how enhanced access and connectivity to digital technology allows for people to gain more exposure / providing more opportunities to become familiar with a wider range of digital technologies they may not have access to (1) which would encourage skills development in a range of technologies for working in the digital sector (1).
- by promoting enhanced access and connectivity to digital technology Milena will identify opportunities for students to access technology that they currently don't have access to (1). By gaining experience of using this technology it will enhance the student's digital skills and create more employment opportunities (1).

Accept any other suitable response.

16	Gemma runs a large accountancy firm and is in the process of planning an IT equipment update. The firm has several branch offices that are supported by one central IT team at head office. Gemma has been advised by a consultant that other firms have achieved success moving to virtual computer systems.
	She is particularly interested to know more about how virtual computer systems would allow the IT team to support the wider firm more effectively.
	Explain one **way that virtual computing systems could help the IT team provide better support.**
	[2 marks]

AO2 = 2 marks

Award **one** (AO2) mark, up to a maximum of **two** marks.

- Gemma's firm could run many virtual computer systems from a small number of physical systems located in the head office (1). This would allow the IT team to resolve issues at source rather than be required to spend time travelling to sites to resolve issues (1).
- if Gemma's team used virtual computers, it would mean that the IT department would have less physical hardware to maintain (1). This would result in in them having more time available to install, update and maintain the virtual machines resulting in better support (1).

Accept any other suitable response.

17	Paige is troubleshooting a network issue that is preventing a host on her local network being able to communicate with a host on another network. Communication between hosts on the same network is working fine.
	She is currently researching the open system interconnection (OSI) network reference model. She is unsure which layer of the OSI model the problem relates to.
	a) Identify which **layer of the OSI model the problem relates to.**
	[1 mark]
	b) Explain how this layer relates to network communication.
	[2 marks]

AO1 = 1 mark
AO2 = 2 marks

a) Award **one** (AO1) mark for the correct identification of the network layer.

- the network layer (1).

  Accept only this response.

b) Award **one** (AO2) mark, up to a maximum of **two** (AO2) marks.

- Layer 3 devices use logical addressing to identify each device on the network known as an IP address (1). Each device is allocated an IP address and this is used when routing data to its destination (1)
- the host machine needs to have the correct IP address, subnet mask and default gateway (1). If these are not configured correctly then it can prevent communication with hosts on other networks (1)
- the main function of layer 3 is routing which means that routers operate at the layer (1). When a host on one network wants to communicate with a host on another network the data must pass through the router, therefore the host needs to be configured to allow this (1)

Accept any other suitable response.

18	Safia is the managing director of a software company that has a small IT service team. This team currently look after the IT hardware and services and provide technical advice to external customers. Feedback from customers has highlighted issues with the support being offered to them. Several have complained that the support team do not respond to support requests in a timely manner. Safia would like to move the ticketing system to the cloud for improved performance and to remove the burden from the IT support team. She is considering which cloud service would be most appropriate from: • **infrastructure as a service (IaaS)** • **platform as a service (PaaS)** • **software as a service (SaaS).** **Assess how** one **of these cloud services would be suitable for Safia's company.** [3 marks]

AO3 = 3 marks

Award **one** (AO3) mark, up to a maximum of **three** (AO3) marks.

- an IaaS solution may not be the most appropriate for the ticketing system as it would still require some administration from the IT support team (1). This solution would require Safia's team to manage the underlying operating system, the ticketing system application itself and any data (1). However, it would provide a cloud-based solution that would move the infrastructure to the cloud relieving some of the burden on the IT team.(1)
- a platform as a service (PaaS) solution would provide a good solution for Safia as the cloud host would look after many aspects of the system that the ticketing system is hosted on (1). The cloud provider would look after all hardware elements as well as the underlying operating system and storage (1). This means that it would partially resolve Safia's problem by reliving some of the burden on the IT team (1).
- software as a service (SaaS) would provide the best solution for Safia as her IT support team would only need to access and use the ticketing system (1). The cloud provider would support the underlying system, hardware and any maintenance (1).   This would resolve Safia's problem allowing her team to fully focus on the ticketing system and resolving technical issues for customers (1).

Accept any other suitable response.

19	Research has suggested that there is a demographic imbalance in the digital sector. Demographic imbalance includes poverty, poor health, low levels of education and gender inequality.
	Discuss two approaches that could be used by organisations in the digital sector to address demographic imbalance.
	[6 marks]

AO3 = 6 marks

Award **one** (AO3) mark, up to a maximum of **six** (AO3) marks.

- organisations in the digital sector could make sure that they apply digital inclusion principles to any systems or processes they use. This would make sure that those who wish to engage with these organisations and who are from under-represented demographics would be more likely to do so (1). Government initiatives are aimed at addressing demographic imbalance as they can provide opportunities for organisations to access funding or support to improve their approach (1) such as encouraging younger generations into technical roles or improving opportunities for people from ethnic minority groups (1).
- digital sector organisations should ensure that their recruitment processes are inclusive. This would likely lead to candidates from groups that are under-represented feeling comfortable to apply for job roles and having a good chance of success in the recruitment process (1). Having a diverse workforce (for example, having people from a range of backgrounds who may have protected characteristics) can lead to new ideas that can help organisations come up with innovative products and services (1). Appreciating the importance of cultural awareness could lead to organisations taking an approach to a range of activities that is inclusive and free from any bias that could offend or discourage engagement of those who may have different cultural backgrounds or beliefs (1).

Accept any other suitable response.

20	BulbusNet Ltd is an organisation which provides hosting services for customers.
	The BulbusNet Ltd network was recently the target of a cyberattack which resulted in a lengthy service outage for customers and the loss of confidential corporate documentation. An early report following the attack points to issues around the hardware and software infrastructure of the network, including out of date operating systems and uncontrolled wireless network access. Customers are not happy, and the organisation is worried about their reputation following the cyberattack.
	Evaluate the impacts that security improvements could have on BulbusNet Ltd and their clients.
	Your response must include reasoned judgements and conclusions.
	[12 marks, plus 3 marks for QWC]

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

Band	Marks	Descriptor
4	10–12	**AO3** Analysis of hardware and software solution to improve security and the analysis of the impact of these security improvements 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 benefits of improved security through hardware and software and shows a **detailed** functional understanding of potential impacts of improved security on the organisation and their clients. **AO1** A **wide range** of relevant knowledge and understanding of hardware and software solution to improve security and the impact they may have on the organisation and its clients is **accurate** and **detailed**. The answer demonstrates **comprehensive** breadth and/or depth of understanding.
3	7–9	**AO3** Analysis of hardware and software solution to improve security and the analysis of the impact of these security improvements is **in most parts effective** and **mostly relevant**, showing **mostly logical** and **coherent** chains of reasoning throughout. Given conclusions are fully supported by judgements that consider most of the relevant arguments. **AO2** Applied **mostly relevant** knowledge of improved security through hardware and software related to the context (improving security) showing **mostly** functional understanding of the impacts of improved security on the organisation and their clients. **AO1** Knowledge and understanding of hardware and software solution to improve security and the impact they may have on the organisation and its clients is **in most part 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** Analysis of hardware and software solution to improve security and the analysis of the impact of these security improvements 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 improved security through hardware and software related to the context (increased security) and may show a lack of functional understanding of the impacts of improved security on the organisation and their clients. **AO1** Knowledge and understanding of hardware and software solution to improve security and the impact they may have on the organisation and its clients shows 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** Analysis of hardware and software solution to improve security and the analysis of the impact of these security improvements 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 of improved security through hardware and software but with **little relevance** to the context (increased security). **AO1** Knowledge and understanding of hardware and software solution to improve security and the impact they may have on the organisation and its clients shows very **minimal** accuracy, focus and relevance. The answer has **isolated** points, showing **very minimal** breadth and/or depth of understanding, with **significant** inaccuracies and omissions.
	0	No creditworthy material

Quality of written communication (QWC) = 3 marks

Marks	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. 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 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: The student will evidence knowledge and understanding of the security improvements BulbusNet Ltd could use that may include:

Hardware:

- switch
- router
- devices (for example, computers, laptops, smartphone)
- firewall
- network interface devices (for example, peripheral component interconnect (PCI) network cards, universal serial bus (USB) network cards)
- cabling (for example, copper, fibre optic)
- wireless access point (WAP).

Software:

- system software (for example, proprietary operating systems, open source operating systems, network operating systems (NOS)
- file management utilities
- application software (for example, productivity suites, protection software, web browsers).

AO2: The student will apply general knowledge of benefits of the impacts of security improvements to BulbusNet Ltd and their clients relating to the context

and

AO3 The student will evidence analysis of the impacts that security improvements could have on BulbusNet Ltd and their clients that may include:

The BulbusNet Ltd network infrastructure must implement secure hardware and software to ensure there are no other successful attacks on the network.

A first recommendation would be to ensure that all computers run modern operating systems. All client computers must run current desktop operating systems such as Windows 10 or 11 or MacOS Ventura. Current operating systems receive regular security updates from the software vendor meaning that security issues and vulnerabilities are resolved quickly. This would give clients confidence that the BulbusNet Ltd network is secure from attacks that could cause be successful against older, unsupported operating systems.

Network servers should run dedicated network operating systems such as Microsoft Windows Server or Red Hat Enterprise. These network operating systems are designed to offer excellent performance for network users and are built to secure network data. Network operating systems such as these can even be run without a graphical user interface meaning that they are much more difficult to attack than other operating systems. This would increase the security of the BulbusNet Ltd network and make it extremely difficult to attack.

Routers should be installed within the network to segment parts of the network. This would allow for devices that must be directly connected to the Internet, such as web servers, to be held in separate networks to devices that should not be directly connected. The impact this would have isBulbusNet Ltd could make sure important devices that store confidential data would not be connected directly to the internet, making it a lot less likely that data could be exploited on them by attackers.

Wireless access points should be secured by making sure that they require authentication for users to join wireless networks. This could be done either through requiring a passcode or by users providing their standard login. A separate guest wireless network should be implemented to keep guest access to the network separate. This would greatly improve the wireless infrastructure of the network and would make it unlikely that wireless users would be able to access secured resources without successful authentication.

Client devices should be updated with all the latest security patches and controlled by the organisation to ensure any information contained on them is secure. There should be regular training to educate employees about security threats. Strong passwords should be enforced, and multi-factor authentication (MFA) used when accessing company systems. All devices should have anti-virus software installed and this should be regularly updated. Access controls should be configured using the most appropriate technique (for example, least privilege) and finally, the firewall should be set up to only allow acceptable traffic and deny everything else to prevent unauthorised access. By implementing all these security improvements all systems will be more secure as access will be restricted, and data will be protected.

Section C: Learning and planning   **Total for this section: [20 marks]**

21	**Give** one **example of a reflection technique.**
	[1 mark]

AO1 = 1 mark

Award **one** (AO1) mark for a correctly identified reflection technique:

* Kolb's Experiential Learning Cycle (1)
* Gibbs' Reflective Cycle (1)
* Boud, Keogh and Walker's model (1).

Accept any other suitable response.

22	**Describe** one **principle of project planning which is used to identify project aims and objectives.**
	[1 mark]

AO1 = 1 mark

Award **one** (AO1) mark for a description of a suitable project planning principle:

* user requirements can be used to identify aims and objectives of projects by allowing those that use a system to outline the things they need from it (1)
* deadlines can help identify the aims and objectives of projects by setting a timeframe that a project must be completed within, meaning any identified must be realistic to achieve in relation to the deadline (1).

Accept any other suitable response.

23	Richard is developing a new application which will allow his customers to host high quality image and video content. The project is early in the planning stage and Richard is holding a meeting with the project team on the consequences of ineffective project planning. A launch window has been provided to customers that have already signed up for the new application.
	a) Identify one **consequence of ineffective project planning.**
	[1 mark]
	b) Explain how the identified consequence of ineffective project planning could have an impact on the development of Richard's app.
	[2 marks]

AO1 = 1 mark
AO2 = 2 marks

a) Award **one** (AO1) mark for one consequence.

- under-resourced (1)
- escalating costs (1)
- exceeding timeframes (1)
- unable to deliver outcomes (1)
- scope creep (1).

Accept any other suitable response.

b) Award **one** (AO2) mark, up to a maximum of **two** (AO2) marks.

- if the project is under-resourced there could be multiple issues. Firstly, there may not be enough staffing resources meaning there are delays on meeting the project deadline, resulting in them missing the app launch day (1). Also, this could impact on the quality of the product as some elements of the project might be rushed resulting in an app that is launched with bugs, or limited features, that will need further investment to resolve (1)
- if there are escalating costs on the project then the app would exceed the budget which could result in the project needing to reevaluate project priorities (1). In this case the app might be scaled down which would mean that features are removed or in an extreme case even cancelled (1).
- exceeding timeframes would mean that the app may not be ready for launch during the window when the customers expect it to be (1) which could lead to customer complaints / damaged reputation (1).
- failure to deliver outcomes can result in challenges such as wasted resources which would mean that any time, money and manpower invested into the app already would be lost (1). It could also lead to reputational damage making it less likely for people to invest into the app or other products owned by the company (1).
- scope creep is quite common and could occur if the scope of the app isn't identified at an early stage (1). As the app is in development the requirements and features may change resulting in the project running over budget and outside the initial planned release date (1).

Accept any other suitable response.

24	Fran works as an IT support consultant who offers advice on network security to small and medium enterprises. To appeal to new customers, Fran is putting together a booklet on protecting against the most common network threats and would like to ensure that the booklet contains up to date information from reliable sources.
	a) Give one **reliability or validity factor.**
	[1 mark]
	b) Explain why Fran should consider this factor when researching information for her booklet.
	[2 marks]

AO1 = 1 marks
AO2 = 2 marks

a) Award **one** (AO1) mark for a reliability or validity factor:

- author expertise (1)
- bias (1)
- evidence (1)
- date of publication (1)
- corroboration of sources (1)
- citations (1).

Accept any other suitable response.

b) Award **one** (AO2) mark, up to a maximum of **two** (AO2) marks.

- it's important that Fran considers the authors expertise as this will ensure that the source is reliable and valid as the author has experience in their field (1). The author may have worked in the sector for many years and is providing guidance based on their industry experience meaning that the information is relevant (1)
- it's important for Fran to consider bias as not considering this could result in sources that are not reliable and valid as they are based upon personal opinion rather than facts or figures (1). For example, the author might be getting sponsorship for an article they have written which would result in them providing a very biased review in favour of the sponsor (1)
- it's important that any sources Fran considers are based on evidence containing facts and figures as this will allow her to check their accuracy (1). Evidence within an article will demonstrate to Fran the accuracy of the information she has sourced and allow her to confirm this through alternative channels (1)
- it's important that Fran checks the date of publication as this will let her know how recent the article has been published (1). As the digital sector is constantly evolving it's important to make sure that any sources Fran is using is current so that it references to recent technology and trends (1)
- corroboration of sources is an important aspect for Fran to consider as multiple sources could rely on the same initial source which is aligned to their individual belief (1). If a number of sources all then rely on the same perspective, then there will be limited scope and important information could be missed (1)
- it is important for Fran to consider citations as they provide a way for her to trace the evidence and verify any information in the source she is using (1). As the digital sector is constantly evolving, if the citations are outdated then the source may be based on information that is no longer current practice (1)

Accept any other suitable response.

25	Bindi runs a logistics company which uses vehicles to deliver consumer electronics, fresh food and clothing to customers across the UK. A recent survey has highlighted that a large proportion of customers feel that deliveries are rarely on time and there is little communication to inform customers of delays. There has been an increase in complaints about spoiled fresh food being delivered to customers, increasing food waste. Bindi is interested in how she could use artificial intelligence (AI) to improve the quality of service to her customers. Assess the impact that AI could have on the logistics company. [3 marks]

AO3 = 3 marks

Award one (AO3) mark, up to a maximum of **three** (AO3) marks.

- artificial intelligence (AI) could be used to plan efficient routes for drivers delivering fresh food by using real-time data to modify routes and avoid issues with traffic, road closures etc (1). This would help to ensure that drivers keep to their delivery schedule and cut down on rescheduled deliveries and on waste when delivering fresh food to customers (1). This may lead to Bindi's customers being more satisfied with delivery times and the impact on the environment cause by food waste (1)
- by using artificial intelligence (AI) the company could use AI-powered tracking which would provide real time visibility of all shipments (1). This would improve customer communications as they would know exactly where products are and when they should be expected (1). By knowing this information, it means that the logistics company would be able to quickly identify and problems and resolve this quickly resulting in less delays (1)

Accept any other suitable response.

26	Erin runs a successful training company. The company is relocating to a new office to allow for increased headcount and future growth plans. This project will involve installing and configuring the new office network, moving departments to the new office in a phased manner, and decommissioning the old office site. Erin has assembled a project team and is meeting with them to discuss project planning techniques that could be used to ensure that the office move project is a success. During the meeting they discuss the following techniques: • **programme evaluation review technique (PERT)** • **critical path analysis (CPA)** • **must have, should have, could have, won't have (MoSCoW)** Discuss the impact that one **project planning technique could have on the success of Erin's project.** Your response must include reasoned judgements and conclusions. [3 marks]

AO3 = 3 marks

Award **one** (AO3) mark, up to a maximum of **three** (AO3) marks.

- using the PERT technique will allow for Erin to identify the activities that will make up the overall project and estimate timescales for completion (1) all required activities will be planned which would allow Erin to take action should they not be completed as expected (1) This helps improve the chances of success as each phase of the move could be completed before the next started (1)
- critical path analysis can be used by Erin to identify the longest sequence of activities that are crucial to the project being a success (1) Erin would be able to plan which resources would be required at any time during the phased move (1) minimising any impact on the teams and the training they provide (1)
- MoSCoW can be used by Erin to prioritise the requirements of the project (1). The impact of using this technique is that the project can be managed by Erin in a manner which makes sure all the activities that relating to the 'must have' requirements of the project are always completed (1), while having the ability to more flexible when it comes to other requirements that have less priority (1).

Accept any other suitable response.

27	Natalia is currently working as a project manager on a development project with a new client. The client requires a new helpdesk ticketing system to be built to replace their current ticketing system. The managing director of the client has provided a vague outline of what they need.
	Natalia wants to employ the design thinking techniques to better understand the needs of the client.
	a) State one **suitable design thinking technique.**
	[1 mark]
	b) Explain how the stated technique can help Natalia when researching requirements for the project.
	[2 marks]

AO1 = 1 mark
AO2 = 2 marks

a) Award **one** (AO1) mark for identifying a design thinking technique:

- identify users' needs (1)
- define the problem (1)

Accept any other suitable response. Do not accept responses that do not relate to understanding client needs.

Award **one** (AO2) mark, up to a maximum of **two** (AO2) marks.

- Natalia must define the problems that the client has with their current system. The information passed over from the managing director is vague and therefore is not likely to include this (1). Natalia could do this by observing the users of the current system and talking to them about the problems that they have experienced (1)
- Natalia should identify the needs of the users. She could do this by talking to those who use the current system and the client's customers (1). This will help Natalia better understand the user requirements of the system (1)

Accept any other suitable response.

28	Tanveer is a project manager for a new systems development project, developing a new mobile app for a building merchant. The mobile app will allow customers to order products for collection in store from their smart device.

28 **Tanveer is a project manager for a new systems development project, developing a new mobile app for a building merchant. The mobile app will allow customers to order products for collection in store from their smart device.**

The last project undertaken by Tanveer's team was not successful. To ensure this is not repeated he would like to focus on quality management.

a) Identify one **aspect of quality management.**

[1 mark]

b) Explain how Tanveer could use this aspect of quality management to help ensure his project is a success.

[2 marks]

AO1 = 1 mark
AO2 = 2 marks

a) Award **one** (AO1) mark for identifying an aspect of quality management:

- monitoring of project deliverables (1)
- quality assurance (1)
- quality control (1)
- review and audit (1).

Accept any other suitable response.

b) Award **one** (AO2) mark, up to a maximum of **two** (AO2) marks.

- Tanveer should make sure that he is monitoring the project deliverables as this will help to make sure that the deliverables of the project are being achieved (1) Achieving such deliverables will make it more likely that Tanveer's project is a success and that they are within the allocated timeframe and budget (1)
- Tanveer must make sure to employ quality assurance processes. This would give him the confidence that all aspects of the project that fall under the assurance process are meeting a defined quality standard (1). This would make sure that the project is being completed to a high standard and that the app is fully functional and meets the project requirements (1)
- Quality control plays an important part in project management as it will ensure that Tanveer's mobile app meets the expected standards and expectations and prevent deviation from the project's requirements (1). Through quality control processes, monitoring and managing the project will identify and minimise errors and defects by finding them early in the project lifecycle (1)
- Reviewing and auditing will provide Tanveer with a systematic approach to evaluate components, processes, and outcomes (1). Reviews and audits are tools that can be used to detect errors and defects, identify risks, ensure compliance, and evaluate performance (1)

Accept any other suitable response.

Assessment Objective Grid

Question	AO1	AO2	AO3	Total
1	2			2
2	2			2
3 (a)	1			1
3 (b)		2		2
4 (a)	2			2
4 (b)		2		2
5		2		2
6		2		2
7		4		4
8			3	3
9			6	6
10	4	4	4	12 (3)
11	2			2
12	2			2
13		2		2
14 (a)	2			2
14 (b)		2		2
15		4		4
16		2		2
17 (a)	1			1
17 (b)		2		2
18			3	3
19			6	6
20	4	4	4	12 (3)
21	1			1
22	1			1
23	1	2		3
24 (a)	1			1
24 (b)		2		2
25			3	3
26			3	3
27 (a)	1			1
27 (b)		2		2
28 (a)	1			1
28 (b)		2		2
Total	**28**	**40**	**32**	**100 (106)**

Document information