

T Level Technical Qualification in Digital Support Services

Core knowledge and understanding

Paper A

Mark scheme

v1.1: Specimen assessment materials
September 2021
603/6901/2

Internal reference: DSS-0013-01

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 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 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 levels-based descriptors and indicative content.

Levels-based descriptors: each level 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 level-based descriptor is worth varying marks.

The grids are broken down into levels, with each level having an associated descriptor indicating the performance at that level. 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 level, you should move to the next one, and so on, until the response matches the level 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 levels, you should use a best-fit approach at this stage and use the available marks within the level 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

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 assessment objective can be found in the Qualification Specification.

Section A: Business context and culture

**Total for this section: [41 marks]
[plus 3 marks for QWC]**

1 Unsafe or inappropriate use of digital technology can affect a person's health. Describe one action that could reduce this risk.

[2 marks]

AO1 = 2 marks

Award up to **two** marks for a description of **one** action that could be undertaken to reduce the risk of effects upon a person's health. For example:

- regulate an individual's use of digital technology (1) by taking breaks or setting time limits (1)
- undertake a workstation assessment or display screen equipment (DSE) assessment (abbreviation of DSE should be awarded) that checks the set-up of all elements of the workstation (including back support and footrest) (1) and implement/action any recommendations for safe set up (1).

Accept any other suitable response.

2 Businesses have a range of different internal stakeholders.

Name three different internal stakeholders and briefly describe how each stakeholder you have named could influence the way a digital business operates.

[3 marks]

AO1 = 3 marks

To achieve each mark, students must correctly name both an internal stakeholder and include a brief description of their potential influence, up to a maximum of **three** marks. For example:

- owners – influence by setting objectives for a business (1)
- board of directors – influence by allocating funding to different projects (1)
- employees – influence by their particular experiences and expertise relating to job requirements (1)
- departments – influence a business by their specific requirements needed to complete work allocated (1).

Accept any other suitable response.

3	<p>A company has recently moved to working in 3 locations, each of which has limited space. Staff must regularly travel between them for meetings. Their IT equipment is old and needs to be updated.</p> <p>The company wants to reduce operating costs and increase productivity.</p> <p>They are considering whether remote working would support this.</p> <p>Describe four possible impacts on the company of moving to remote working.</p>
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[4 marks]

AO2 = 4 marks

Award **one** mark for each different description of an impact on the company that is applied to the scenario, up to a maximum of **four** marks. For example:

- introduction of remote working will reduce travel between the different sites as the company's staff can hold remote meetings (1)
- introduction of remote working would require an update to the company's IT equipment to support digital communication methods (1)
- introduction of remote working will resolve the issue of space in the company's offices as staff can work from home and won't require desks or meeting areas in the office (1)
- introduction of remote working will reduce costs to the company from travel (1)
- reduced travel time will mean that the company could plan for an expected increase in productivity (1).

Accept any other suitable response.

4	<p>A local florist is developing a website to start selling their products online instead of from their high street shop. They have a target to increase their profits by 50%.</p> <p>Discuss four ways in which a digital approach could help them to meet their target.</p>
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[4 marks]

AO3 = 4 marks

Award **one** mark for each discussion point about the way in which digitalisation could help the business meet their targets, up to a maximum of **four** marks, for example:

- the business could use multiple digital approaches to promote products and services to specific target markets, this would increase sales and promoting products where there is excess stock, would reduce waste (1)
- the use of a website to take sales could reduce operating costs such as overheads as there is no cost for the physical store or staff to work in the store (1)
- the website will enable them to sell and advertise to a larger geographical target market which could include new potential customers from a wider area who may not have been aware of the shop (1)
- customer online surveys could be used to monitor customer satisfaction scores. This could result in information leading to the business producing a superior product and therefore improve competitiveness (1)

Accept any other suitable response.

5	<p>A digital marketing agency is completing a major update of its customer content management system.</p> <p>Describe both of the following processes:</p> <ul style="list-style-type: none">• roll back planning <p>documenting.</p> <p>Explain why each process could be important to the business when they integrate new systems.</p> <p style="text-align: right;">[4 marks]</p>
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AO1 = 2 marks

AO2 = 2 marks

AO1: Award **one** mark for each description of the processes provided (roll back planning and documentation) **one** mark per process, up to a maximum of **two** marks.

For example:

AO1

- roll back planning is a way of planning for a business to go back to a previous version of a system when making system changes (1 AO1)
- documenting is recording up-to-date information of the change (1 AO1)
- documenting is recording all decisions (1 AO1)
- documenting is updating training manuals to ensure they accurately record any process changes required as a result of the system change (1 AO1)

AO2: Award **one** mark for each explanation of the importance of the process to the business (in the integration of new systems) **one** mark per process, up to a maximum of **two** marks.

For example:

AO2

- roll back planning allows the business to go back to the previous system and restore any marketing collateral or other content if the change is not successful or the system update fails (1 AO2)
- documenting is important so the agency can continue to deliver client marketing campaigns as agreed following the update (1 AO2).

Accept any other suitable response.

6 A business is considering changes to their digital systems to reduce their carbon footprint, become more eco-friendly and reduce operational costs. These changes require them to install a range of power efficient components into their digital infrastructure. These new components will have to operate effectively with the existing components, to avoid disruption to the services used by staff.

a) Describe three preparation and planning tasks that would facilitate these changes.

b) Describe three operational tasks that would facilitate these changes.

[6 marks]

AO2 = 6 marks

Award **one** mark for each preparation and planning task described in relation to the scenario, up to a maximum of **three** marks. For example:

- effectively communicate to staff the planned changes to create awareness or buy-in (1)
- workforce planning to support the installation and ensure adequate staff are available (1)
- disposal of the old equipment (1)
- planning for the interface of new products (1)
- planning of timescales to limit any impact on staff (1).

Award **one** mark for each operational task described in relation to the scenario, up to a maximum of **three** marks. For example:

- implement testing to ensure that the new eco-friendly components work efficiently with existing components so that there is no disruption to the operations of the business (1)
- any faults that arise from the integration of the new components should be fixed in a timely manner to ensure negative impacts to staff are reduced (1)
- training staff on the new systems to ensure the most efficient use of energy and resource usage. This will ensure best practice for the new tracking tools and processes (1).

Accept any other suitable response.

7 A UK organisation is looking for new markets outside the UK to increase their sales. The organisation specialises in high-end technological devices such as the latest smartphones and tablets.

Discuss three economic factors which could impact the business entering markets outside of the UK and how these could be mitigated.

[6 marks]

AO3 = 6 marks

Award **one** mark for a relevant discussion point for each economic factor, up to a maximum of **three** marks
Award **one** mark for each mitigation of the economic factors, up to a maximum of **three** marks

Indicative content

- The cost of doing business could be high as some markets may have additional tariffs on overseas organisations which may impact the ability for the organisation to be profitable. This is because the tariff will be an additional cost that needs to be deducted from the business's revenue and therefore impact on its potential profitability (economic factor, 1). However, the cost of these tariffs could well be offset by the potential additional market size available so this would have to be considered and the balance of cost against revenue considered (mitigation, 1).
- In the case of recession in the potential market then it is likely that a lower price should be charged, or the product launch delayed, particularly as the products are 'high-end' (economic factor, 1).
In recession the economy is shrinking, customer confidence is low and therefore spending reduces. However, this could be short term and the business would therefore benefit in the long term by already being established and recognised in the market (mitigation, 1).
- The consumer trends of the region must be taken into account to ensure that a market exists for the high-end devices to be sold to. Without this market there would be no demand and therefore revenue would be low. This low level of revenue might not equal costs and therefore loss would be made (economic factor, 1).
This would require research into the new market which is likely to be financially expensive, but the knowledge gained would potentially avoid a costly release of a product that has little or no demand (mitigation, 1).

Accept any other suitable response.

8	<p>A local community sports club has set up a website for customers to book sessions and make payments. Customers must book through an unsecured area of the website. To make a booking, customers must enter their personal details. This information is then stored in a spreadsheet that is accessible by all sports club staff. There is no option for customers to make bookings in person.</p> <p>Discuss the risks of the booking process and evaluate the possible impacts of these risks on the sports club and their customers.</p> <p style="text-align: right;">[12 marks plus 3 for QWC]</p>
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AO1 = 4 marks

AO2 = 4 marks

AO3 = 4 marks

Band	Mark	Descriptor
4	10–12	<p>AO3 Discussion of risk impact 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.</p> <p>AO2 Applied all relevant knowledge of risk to the context (impact on the sports club) and shows a detailed functional understanding of risks and impacts.</p>

		<p>AO1 A wide range of relevant knowledge and understanding of risk and impacts of risk is accurate and detailed.</p> <p>The answer demonstrates comprehensive breadth and/or depth of understanding.</p>
3	7–9	<p>AO3 Discussion of risk impact 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.</p> <p>AO2 Applied mostly relevant knowledge of risk to the context (impact on the sports club) showing some functional understanding of risks and impacts.</p> <p>AO1 Knowledge and understanding of risk and impact of risk is in most parts clear and mostly accurate, although on occasion may lose focus.</p> <p>The answer demonstrates reasonable breadth and/or depth of understanding, with occasional inaccuracies and/or omissions.</p>
2	4–6	<p>AO3 Discussion of risk impact 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.</p> <p>AO2 Applied some but limited knowledge of risk to the context (impact on the sports club) and may show a lack of functional understanding of risks and impacts.</p> <p>AO1 Knowledge and understanding of risk and impact of risk show some but limited accuracy, focus and relevance.</p> <p>The answer is basic and shows limited breadth and/or depth of understanding, with inaccuracies and omissions.</p>
1	1–3	<p>AO3 Discussion of risk impact is minimal and very limited in effectiveness and relevance. Given tenuous conclusions that are unsupported and show little relevance to the question aims.</p> <p>AO2 Applied general knowledge and/or general assertions about risk with little relevance to the context (impact on the sports club).</p> <p>AO1 Knowledge and understanding of risk and impact of risk shows very minimal accuracy, focus and relevance.</p>

		The answer has isolated points, showing very minimal breath and/or depth of understanding, with significant inaccuracies and omissions.
0	0	No relevant material.

Quality of written communication (QWC) = 3 marks

Mark	Descriptor
3	The answer is clearly expressed and well structured. The rules of grammar are used with effective control of meaning overall. A wide range of appropriate technical terms 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

Key principles

AO1 Risks

- Privacy – potential loss of control over personal and business information
- Security – compromises to the confidentiality, integrity and availability of all business data
- Non-compliance – non-adherence to policies, procedures and legislation
- Audience exclusion – bias towards a particular demographic
- Technical – system not fit for business purpose, does not meet user requirements

Potential impact of risks:

- lawsuits – as a result of failing to address the given risk should it be deemed to break the law
- fines – there could be financial impact if the risk breaches a law. This would be as a result of legal proceeding or breaching professional standards
- reputational/brand damage – a risk that is shown to damage the customers interest would damage its reputation amongst its customers and this would likely spread to potential customers
- withdrawal of licence – if a license or certification to run the organisation is required then this could be withdrawn as a result of the risk being in existence
- loss of business – reduction in sales as the risk will mean that competing businesses will

- have a better impression amongst customers. Also, there is no option to book in person which would exclude certain areas of the community
- stolen data being potentially used by fraudsters.

AO2 Application

Because the sports club has an unsecured part of the website then data transferred by customers on this can be intercepted or stolen by people with malicious intent.

Personal information and bank details are stored insecurely as part of the sports club processes. These details include those of the person making the booking. This would be very sensitive information and is only secured on a spreadsheet. This is unsecure as it is accessible by all members of staff.

It appears that no password or access control is required when making a booking as these are made on unsecure areas.

As there is no facility to book in person or over the telephone then significant proportion of the population would either not be able to access the sports club or be willing to book on an unsecure site.

AO3 Evaluation

This data that could potentially be accessed and lost by members of staff would lead to reputational damage as this would inevitable be published and the local community made aware of this. Should this happen then the sports club might find it difficult to continue and may no longer be able to operate as customers go elsewhere.

Security practices breach GDPR. As security practices at the club are extremely poor, then they are open to possible breaches of GDPR regulations. This could potentially result in legal action and potential fines. For a small club this could mean they can no longer operate.

As customer passwords are not required to access the system then anyone could make bookings even if they are not a member. As this is a local sports club, then it is likely to attract a local customer base who would not appreciate non-members attending. Also, if there is an annual fee then non-members who make booking would be able to bypass this and the club would lose revenue.

Section B: Diversity, inclusion and digital environments

**Total for this section: [37 marks]
[plus 3 marks for QWC]**

9 Jane runs a marketing consultancy business from home. She regularly uses a range of online tools to facilitate online banking, video conferencing and online collaborative working.

Jane has a poor internet connection because of where he lives.

Explain two ways poor internet connection could have an adverse effect on Jane's business.

[2 marks]

AO2 = 2 marks

Award **one** mark for each explanatory point, up to a maximum of **two** marks. For example:

- a poor internet connection would impact on video conferencing and collaborative working reducing its effectiveness (1) and professional appearance (1)
- Jane could lose business to competitors as she could be unproductive and therefore more costly to operate (1)
- Jane's business may involve use of large image/graphic files, and poor internet will slow down working with these files (1).

Accept any other suitable response.

10 The table below shows a list of descriptions.

Select the number of the correct description for each of the below:

- router

- switch

	Description
1	A device that broadcasts network packets to all connected devices
2	A device that sends network packets directly to intended device using MAC address
3	A device that interconnects different networks and subnets
4	A device that provides network access to wireless clients

[2 marks]

AO1 = 2 marks

Award **one** mark for matching each device to the correct the description up to a maximum of **two** marks.

- router – a device that interconnects different networks and subnets, option 3
- switch – a device that sends network packets directly to intended device using MAC address, option 2

11 An algorithm design analyses people's race, employment status and credit rating to determine whether they should be approved for a loan.

State which piece of UK legislation this algorithm could be in breach of, and briefly describe why it might breach that legislation.

[3 marks]

AO1 = 3 marks

Award **one** mark for stating the Equality Act 2010, and **two** marks for describing that the algorithm design discriminates against race. For example:

- the algorithm would breach the Equality Act (2010) (1) because when deciding on whether to approve a loan it discriminates (1) against race (1).

12 A local shop has donated two PCs and a printer to a local library. The library would like to use this equipment to create a network. The network will support those in the community that do not have access to the internet or computers at home.

Aims of the project include:

- help with job search and job applications
- educational activities
- ensuring the online safety of community members using the computers.

The library wants to keep the computers safe from cyber attacks and misuse.

a) Explain two ways in which the library could use hardware components to establish the network between the PCs and printer and allow internet access and printing in a secure way.

b) Explain two ways in which the library could use software to achieve the aims of the project.

[4 marks]

AO2 = 4 marks

a) Award **one** mark for each explanation of the way in which the library could use hardware components to establish the network between the PCs and printer and allow internet access and printing in a secure way, up to a maximum of **two** marks.

Hardware:

- cabling could be used to connect the devices to the library network (1)

- switch could be used to switch traffic to allow the devices to communicate with each other and with other devices on the library network (1)
- router can be used to switch traffic, but in addition allow connection to the library's internet (1).

Accept any other suitable response.

b) Award **one** mark for each explanation of the way in which the library could use software to achieve the aims of the project, up to a maximum of **two** marks.

Software:

- system software – operating system would provide a visual interface for users to use (1)
- application software for productivity such as word processor and spreadsheet software, would allow users to create CVs and applications (1)
- application software for accessing the internet, to conduct job searches (1)
- application software for protection such as internet security to block certain websites or applications (1).

Accept any other suitable response.

13	<p>Harmeet is the managing director of a local gym. He is planning to expand into new locations. He wants to learn about ways that the cloud can provide efficiencies of scale.</p> <p>Explain two ways in which cloud computing could benefit Harmeet's business.</p> <p>[4 marks]</p>
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AO2 = 4 marks

Award **two** marks for each explanation, up to a maximum of **four** marks.

For each explanation the breakdown of marks is:

- a way in which cloud computing can benefit (1) and explain why this way will achieve this benefit (1).

Each bullet below gives an example of the type of answer that would achieve two marks. Students must give **two** explanations of this standard to achieve **four** marks.

- The cloud would allow the gym to access advanced technology without the cost of having to own and configure equipment to run it themselves (1), reduced costs and skills requirement of ongoing maintenance of technology - as IT is not the focus of the gym (1).
- This would allow the gym to utilise enterprise grade protection from attacks such as phishing and ransomware (1), and therefore protect member's data which is vital for this business because they not only hold personal information, such as name and date of birth, but also information on gym sessions attended and health history (1).
- The cloud-based storage would allow the gym records to be accessed from all locations which would reduce the burden of setting up local systems at each new gym (1), and would be easier to scale as the business grows (1).

Accept any other suitable response.

- 14** a) **Describe the functionality of the routing protocols RIP and OSPF.**
b) **A small, single-site business is planning to open new sites. The business is considering which routing protocol to use.**

Evaluate whether RIP or OSPF would be the most effective protocol.

[4 marks]

AO1 = 2 marks

AO3 = 2 marks

a) Award **one** (AO1) mark for a relevant and accurate description of RIP and **one** (AO1) mark for a relevant and accurate description of OSPF protocols. For example:

- RIP is a distance vector protocol. It learns about the destination network through broadcasts from neighbouring routers (1 AO1)
- OSPF is a link-state protocol. It involves two routers communicating with one another. They will provide each other with information of routes that they are aware of and costs for them to reach that location (1 AO1).

Accept any other suitable response.

b) Award up to **two** (AO3) marks for a discussion of the effectiveness of each protocol to the scenario. For example:

- RIP protocols have a hop count that is limited to 15. Therefore, this limited hop count number is suitable for small networks and single site businesses. Due to this RIP protocols would not be suitable for future growth (1 AO3)
- OSPF protocols have no hop count limitations and assesses the shortest path with the least traffic. As such, this protocol is different to RIP and therefore would be more suitable for multi-site businesses as there is no limitation on the size (1 AO3).

Accept any other suitable response.

- 15** **Identify three ways that a digital business can benefit from using a diverse and inclusive recruitment process, and evaluate their possible impacts.**

[6 marks]

AO3 = 6 marks

Award **one** mark for each identified benefit to a digital business of using a diverse and inclusive recruitment process (up to a maximum of **three** marks), and one mark for each impact evaluated as resulting from the identified benefit (up to a maximum of **three** marks).

Students can be awarded marks for evaluation of more than one impact of an identified benefit of a diverse and inclusive recruitment process, for example if they evaluate **three** correct and relevant impacts for **one** benefit, they can be awarded **three** marks.

For example:

- greater appeal to potential employees (identified benefit 1), which widens a business's potential recruitment pool (impact 1) and possible employee skillsets. (impact 1) By ensuring that this

happens then the current democratic imbalance within the digital sector would be addressed and therefore the business will benefit from different opinions and ideas resulting in better decision making (impact 1)

- inclusive recruitment may help to connect authentically to BAME groups. (identified benefit 1)
This may lead to increased positive reputation of inclusivity (impact 1) digital businesses are often impacted by gender imbalances, inclusive recruitment ensures that there is gender balance within the business and represents the communities in which they operate (identified benefit 1), leading to better working relationships (impact 1) and exchange of ideas (impact 1).

Accept any other suitable response

16	<p>You are a digital support specialist working within the IT department of a local college. Recently the domain controller server went offline, causing a major network outage.</p> <p>The college requires that the network must be available 24/7 and allow for staff and students to access services such as email from home and mobile devices. Additionally, users must be able to access the full range of software that the college has available and be able to create, open, edit and save documents, along with uploading documents to the college network.</p> <p>Analyse the college's requirements and make justified recommendations to the board of directors with respect to their digital infrastructure.</p> <p style="text-align: right;">[12 marks, plus 3 marks for QWC]</p>
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AO1 = 4 marks
AO2 = 4 marks
AO3 = 4 marks

Band	Mark	Descriptor
4	10–12	<p>AO3 Analysis of the potential requirements with respect to digital infrastructure and the technologies involved is comprehensive, effective, and relevant, showing detailed understanding and logical and coherent chains of reasoning throughout. Effectively informed judgements that are fully supported, rational and balanced conclusions.</p> <p>AO2 Applied all relevant knowledge of digital infrastructure networks to the context and shows a detailed functional understanding of how technologies link to one another within the digital environment.</p> <p>AO1 A wide range of relevant knowledge and understanding of digital environment and the technologies involved, which is accurate and detailed. The answer demonstrates comprehensive breadth and/or depth of understanding.</p>
3	7–9	<p>AO3 Analysis of the potential requirements with respect to digital infrastructure and the technologies involved is in most parts effective and mostly relevant,</p>

		<p>showing mostly logical and coherent chains of reasoning. Given conclusions are supported by judgements that consider most of the relevant arguments.</p> <p>A02 Applied mostly relevant knowledge of digital infrastructure networks to the context, showing some functional understanding of how technologies link to one another within the digital environment.</p> <p>A01 Knowledge and understanding of digital environment and the technologies involved is in most parts clear and mostly accurate, although on occasion may lose focus.</p> <p>The answer demonstrates reasonable breadth and/or depth of understanding, with occasional inaccuracies and/or omissions.</p>
2	4–6	<p>A03 Analysis of the potential requirements with respect to digital infrastructure and the technologies involved 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.</p> <p>A02 Applied some but limited knowledge of digital infrastructure networks to the context and may show a lack of functional understanding of how technologies link to one another within the digital environment.</p> <p>A01 Knowledge and understanding of digital environment and the technologies involved show some but limited accuracy, focus and relevance.</p> <p>The answer is basic and shows limited breadth and/or depth of understanding, with inaccuracies and omissions.</p>
1	1–3	<p>A03 Analysis of the potential requirements with respect to digital infrastructure and the technologies involved is minimal and very limited in effectiveness and relevance. Given tenuous conclusions that are unsupported and show little relevance to the question aims.</p> <p>A02 Applied general knowledge and/or general assertions about digital infrastructure networks with little relevance to the context.</p> <p>A01 Knowledge and understanding of digital environment and the technologies involved shows very minimal accuracy, focus and relevance.</p> <p>The answer has isolated points, showing very minimal breadth and/or depth of understanding, with significant inaccuracies and omissions.</p>
	0	No creditworthy material.

Quality of written communication (QWC) = 3 marks

Mark	Descriptor
3	The answer is clearly expressed and well structured. The rules of grammar are used with effective control of meaning overall. A wide range of appropriate technical terms 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

AO1: A student's response may include consideration of:

- components of physical computing systems and their applications
- types of networks, hardware, and software and the functions of internet of things (IoT)
- the types and applications of network protocols and network referencing models
- network protocols
- network referencing models
- the components and benefits of virtual computing systems.

AO1: Benefits of cloud and virtual computing:

- cloud portability – ability to move services quickly and easily
- cloud sourcing – purchasing services from a third party using the cloud
- elastic cloud – on-demand services which can be scaled to meet needs
- storage – no physical limitations on storage capacity
- cost effective – efficiencies of scale.

AO2/AO3 Application/analysis

The board of directors should consider the options available to them and consider the financial costs of implementing their decision, along with the benefits provided by the network selected. As the college has specific requirements for user access and improved network reliability, they should invest in new server hardware and provide cloud-based software and network access (AO2).

They should ensure that the network complies with their requirements, for example, that it is available from both home and mobile devices, as this is necessary to comply with the 24/7 access requirements that the college stipulate (AO2).

A virtual computing system allows the college to fulfil these requirements because they can be accessed by any online device regardless of time or location. Although this would be expensive to

establish, it means that staff and students are not limited to working on the college site and can work remotely at a time and place that suits them (AO3).

Should the college move to a cloud/virtual computing environment, then the staff and students will be able to effectively move their work from the college hardware to the home or remote hardware without losing data (AO2). This will allow them to begin working on a document on the college campus and then complete it remotely at their convenience. This will enable the students to continue their studies in their own time which is important for them as they will need to fit their college work around other commitments (AO3).

This will be a feature of the college that would appeal to prospective students and possibly increase the number of students in the future. This increase in student numbers will bring the college more income which will offset the initial costs of establishing the new cloud-based access (AO3).

Section C: Learning and planning

Total for this section: [22 marks]

17 You are troubleshooting a problem.

State one advantage and one disadvantage of using user forums as a source of information to help you.

[2 marks]

AO1 = 2 marks

Award **one** mark for each correct and relevant advantage and disadvantage given to a maximum of **two** marks. For example:

- user forums are an excellent source of information when troubleshooting as it is common that others have had and have rectified the same issue (1)
- a disadvantage of user forums is that not all information can be guaranteed as accurate (1).

Accept any other suitable response.

18 Describe two ways in which ineffective project planning can lead to rising costs.

[2 marks]

AO1 = 2 marks

Award **one** mark for each description of how ineffective project planning can lead to rising costs, up to a maximum of **two** marks. For example:

- a project that has ineffective planning is likely to have rising costs, as the estimates made for resources used within the project will not accurately reflect those incurred (1)
- Ineffective planning may lead to rising costs as the project is likely to go on longer than anticipated, therefore leading to higher costs (1).

Accept any other suitable response.

19	<p>A bank has received a number of complaints from customers about the time it takes to get help online. The bank thinks this is mainly due to a staff shortage and is considering using artificial intelligence (AI) to solve the problem.</p> <p>Define AI and describe the purpose of AI.</p> <p>Explain two ways AI could be used to improve customer experience with the bank.</p> <p style="text-align: right;">[4 marks]</p>
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AO1 = 2 marks

AO2 = 2 marks

AO1: Award **one** mark for defining Artificial Intelligence (AI) and **one** mark for describing its purpose. For example:

- AI is the simulation of human intelligence in digital machines with the aim of mimicking their behaviours and actions (1). The purpose of AI is to learn and solve problems without the intervention of humans. This provides a way of providing accurate decision making without the need of human involvement (1).

AO2: Award **one** mark for each contextualised explanation of a way in which AI can be used in the bank to improve patient experiences. For example:

- AI powered systems could be used to provide assistance that would have previously required a human to provide. For example, online help can be provided by AI. If a customer needed to know the opening times or directions to their nearest branch AI could provide this, reducing the time it takes for the customer to have their question answered (1)
- automated processes can be used for customers that need to make follow up appointments. Whereas before this had to be done by a human – this type of AI could have access to the branch advisor calendar and make appointment without human involvement, reducing the time a customer has to wait to make an appointment (1).

Accept any other suitable response.

20 John has limited mobility.

Justify how each of the following emerging technologies could be used to support John's health needs:

- **internet of things**
- **virtual reality.**

[4 marks]

AO2 = 4 marks

Award up to **two** marks for each justification of how the emerging technologies can be used to meet John's health needs, up to a maximum of **four** marks.

Each justification should include how the emerging technology can be used (1) and reason(s) why it would support John's needs (1).

Each bullet below gives an example of the type of answer that would warrant two marks:

- internet of things can have a positive impact on the health of people as many smart devices will now carry out household tasks for patients such as turning on lights or central heating with voice control (1), this can lead to John being able to retain some independence and live comfortably without risk of injury if his mobility is limited (1)
- virtual reality could have a positive impact on John's life by allowing him to experience places that he no longer can due to health or mobility issues (1), it can also be used to help improve communication with friends and family which can alleviate loneliness (1).

Accept any other suitable response.

21 You are a project manager. You have been asked to develop a new app for mobile devices that will allow users to search for events and pay for tickets. The project owner wants the app to be ready for launch in 8 weeks. He wants customers to be able to use the app to book tickets for a nationwide series of events.

Explain how each of the following factors may impact on planning the development for this project:

- **people and skills**
- **deadlines.**

[4 marks]

AO2 = 4 marks

Award **two** marks for each explanation of how each of the factors may impact on planning of the development, up to a maximum of **four** marks.

Each explanation should include the reason(s) why the factor may have an impact, or impacts, (1) and why this is important in this context (1).

People and skills:

- it is crucial that the right people with the necessary skills are available to work on the project to ensure that it can be delivered on time and effectively (1). This is important as the project

- has an 8 week deadline, and therefore is time critical without the time to train new staff (1)
- if these people are not in place then they must be sourced quickly through the hiring of contractors which is likely to increase the projects expenses (1), which could be problematic to the continuation of the project because it is a new project (1).

Deadlines:

- deadlines lead to issues with project quality as the planning stage may not be as thorough as it could be with a larger deadline, leading to issues later in development (1). This is important as tickets are being sold nationwide through the app and therefore potentially affecting a large number of customers (1)
- the deadline for the project is very tight meaning that the planning of the project must be done extremely quickly (1) to allow as much time for the development of the app (1).

Accept any other suitable response.

22 A small company has started a complex project for the first time. They will need to liaise with a wide range of stakeholders and complete a number of different tasks, which will involve a large number of their staff.

A member of staff has suggested that the business use a critical path analysis tool to manage the project.

Evaluate to what extent you think this approach to the project will be effective.

[6 marks]

AO3 = 6 marks

Award up to **six** marks for a comprehensive and well-reasoned evaluation of critical path analysis as a management tool in project planning.

Award **one** mark for each relevant and well-justified point that contributes to their answer as follows, up to a maximum of **six** marks:

Indicative content

- Critical path analysis (CPA) enables project staff to clearly see what has been completed, what is being completed and what is still to complete. Therefore, this tool is considered the most useful as it shows how tasks link and what has been completed, this makes valuable to a company running a project with a number of different tasks (1). CPA identifies what activities are vital for project completion and therefore it ensures that time is not spent on activities that do not contribute to the success of the project, which helps where resources are limited for example in a small company and it focuses on project completion (1).
- CPA allows managers of a project a way to analyse how well a project is progressing based on planned progress in the critical path to actual progress. As such they could identify a task that is underperforming and redirect assets to that, allowing them to keep their stakeholders up-to-date/informed (1).
- CPA does not assist with the scheduling of members of staff and therefore because the project requires a large number of human resources this could not be controlled CPA (1).
- It is difficult for CPA to adapt to unexpected events or unexpected problems, which the company may encounter as they are completing the project for the first time (1).
- CPA should not be considered due to the time and complexity of developing the diagram plan. This is a huge drawback for a small company like this one, that does not have the time and staff to allocate to this task (1)

Accept any other suitable response.

Assessment objective grid

Question	AO1	AO2	AO3	QWC	Total
1	2				2
2	3				3
3		4			4
4			4		4
5	2	2			4
6		6			6
7			6		6
8	4	4	4	3	15
9		2			2
10	2				2
11	3				3
12		4			4
13		4			4
14	2		2		4
15			6		6
16	4	4	4	3	15
17	2				2
18	2				2
19	2	2			4
20		4			4
21		4			4
22			6		6
Total	28	40	32	6	106

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Owner: Head of Assessment Design

Change History Record

Version	Description of change	Approval	Date of Issue
v1.0	Published.		2020
v1.1	NCFE rebrand.		September 2021