



# **T Level Technical Qualification in Digital Business Services**

## **Core knowledge and understanding**

### **Paper B**

#### **Mark scheme**

Paper number: P001859  
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603/6902/4

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 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**

This assessment requires students to:

- AO1: Demonstrate knowledge and understanding of the Digital Business Services sector
- AO2: Apply knowledge and understanding of the Digital Business Services sector to different situations and contexts
- AO3: Analyse and evaluate information and issues related to the Digital Business Services sector

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

## Section A: Tools and testing

Total for this section: 23 marks

**1 One digital component that needs to be tested is an interface.**

**Which one of the following is a definition of an interface?**

- A** A graphical representation of a program, feature, or file, such as icons
- B** Applications that run on a computer, such as a word processor
- C** Information stored on a computer, such as account details
- D** Physical components of a computer, such as a keyboard

[1 mark]

AO1 = 1 mark

Award **one** mark for correct response

**A** A graphical representation of a program, feature, or file, such as icons

**2 Outline two applications of presentation software.**

[2 marks]

AO1 = 2 marks

Areas which could be outlined include:

- product demo
- sales meetings
- training
- promotion and marketing.

Award **one** mark for each outline of an application of presentation software, up to a maximum of **two** marks.

- A product demo can be illustrated using images and explanations set out on slides. (1)
- Sales meetings can be organised by placing key agenda items and information on different slides. (1)
- Training can be completed by placing key information that employees need to know on slides. (1)
- Promotion and marketing could be carried out by creating a rolling presentation that can be displayed in key areas. (1)

Accept any other suitable response.

<b>3</b>	<p><b>Witterly Castle Trust is a charity that encourages people to learn about local history. The managers of the castle have set up a website to collect donations from the public. The website has had a lot of downtime recently and the managers are keen to use root cause analysis to investigate the reasons for this.</b></p> <p><b>Describe one stage in the root cause analysis process that Witterly Castle Trust could use.</b></p>
<b>[2 marks]</b>	

AO1 = 1 mark

AO2 = 1 mark

Award **one** AO1 mark for a description of **one** stage within the root cause analysis process.

Award **one** further AO2 mark for a relevant link to the scenario.

- Defining the problem involves setting out the specific issues that are to be investigated, (AO1 1) in this case the main problem is the website downtime. (AO2 1)
- Collecting data relating to the problem means gathering quantitative and qualitative evidence that can inform the analysis, (AO1 1) such as the amount of time that the website is down. (AO2 1)
- Identifying the causes of the problem involves looking at evidence to decide why issues have arisen, (AO1 1) such as errors in the configuration of the webserver. (AO2 1)
- Prioritising causes involves looking at the different reasons that a problem has occurred and deciding which are most significant, (AO1 1) such as bugs in the code used within the site. (AO2 1)
- Identifying solutions to the underlying problem, (AO1 1) such as removing bugs from the codebase for the site. (AO2 1)

Accept any other suitable response.

<b>4</b>	<p><b>Total Data Systems and Services operate databases on behalf of clients around the world. They store large amounts of sensitive data. As part of their security procedures, they conduct regular penetration tests on their systems.</b></p> <p><b>Describe one reason why penetration testing could be useful to Total Data Systems and Services.</b></p>
<b>[2 marks]</b>	

AO1 = 1 mark

AO2 = 1 mark

Award **one** AO1 mark for a description of the usefulness of penetration testing.

Award **one** AO2 mark for relevant development of description in relation to Total Data Systems and Services.

- The business can create a controlled environment in which it can identify vulnerabilities in its systems (AO1 1). By subjecting Total Data Systems and Services databases to the kind of attacks that might be used by malicious hackers they could evaluate the areas of weakness and better understand what security controls are necessary to protect their sensitive data. (AO2 1)
- The business authorises attacks on its systems at a given time so that it can monitor the resilience of the systems to those attacks (AO1 1). In order to assess the impact of different levels of malicious activity to ensure that Total Data Systems and Services security procedures are effective. (AO2 1)

Accept any other suitable response.

**5 Harley and Day is a business that provides legal advice to its clients. It operates in ten countries and provides consultations to clients using an online chat service. The business is planning to expand its service to cover clients in an additional five countries. Before the expanded service is offered, the business is planning to stress test its web portal.**

**Discuss three reasons why conducting stress testing on this service before it is launched may be important.**

[6 marks]

AO2 = 3 marks

AO3 = 3 marks

Award **one** AO2 mark per reason relating to the use of stress testing, up to a maximum of **three** marks.

Award **one** AO3 mark for relevant development of each point, up to a maximum of **three** marks.

- Conducting stress testing on this service before it is launched may be important as it would involve subjecting the website to the increased level of demand that is expected when the business launches its new service. (AO2 1) This would ensure that there is sufficient server capacity available to avoid any disruption for the client chat service which could result in poor customer service. (AO3 1)
- Harley and Day should conduct stress testing on the web portal before expanding the service to understand the resilience of the system. (AO2 1) This may be important as it could define if client data could be corrupted by overstressing the system, resulting in loss of confidentiality and potential reputational damage. (AO3 1)
- The tests represent the maximum expected level of demand for the site, (AO2 1) so if the site passes the test, then Harley and Day can be confident that under normal use conditions their site and online services will be stable. (AO3 1)

- Harley and Day will need to have a service of a standard that meets the expectations of customers when it is launched (AO2 1) – if the service fails while being used this will damage the reputation of the company, affecting potential profits and customer retention. (AO3 1)

Accept any other suitable response.

<b>6</b>	<p><b>C&amp;M Business Services offers a consultancy service to businesses. They review systems and processes at a company and collect data. They use the data they collect to build a dashboard that supports managers in making decisions.</b></p> <p><b>Outline two reasons why C&amp;M Business Services might produce a dashboard for its clients.</b></p> <p><b>Explain how each of these reasons are beneficial for clients of C&amp;M Business Services.</b></p> <p>[4 marks]</p>
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AO2 = 2 marks

AO3 = 2 marks

Award **one** AO2 mark for each reason for producing a data dashboard to a maximum of **two** marks.

Award **one** AO3 mark for each explanation of how these reasons are beneficial to the clients of C&M Business Services up to a maximum of **two** marks.

- The dashboard allows the business to monitor its key performance indicators (KPIs) which means that trends relating to KPIs can be observed (AO2 1) allowing the managers of the business to detect changes in performance quickly and take appropriate corrective action. (AO3 1)
- The dashboard will display management information that is needed by senior staff in the business to judge if they are achieving their goals (AO2 1) this allows the management team to allocate resources effectively based on whether specific parts of the business are performing as expected or not. (AO3 1)
- The dashboard will contain business intelligence that can be used to benchmark against the performance of competitors (AO2 1) this allows the business owners to determine whether the company is being run well compared to its rivals. (AO3 1)

Accept any other suitable response.

<b>7</b>	<p><b>Custer Coaching provides support to clients in large businesses. A team of expert coaches works with clients to develop their people skills. Coaches produce monthly reports that need to be shared with their team to help them plan future development sessions for clients. Collaboration is important at Custer Coaching.</b></p> <p><b>Describe three communication tools that could help Custer Coaching staff collaborate on documents.</b></p> <p><b>Explain how each tool could help coaches to better support their clients.</b></p> <p>[6 marks]</p>
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AO2 = 3 marks

AO3 = 3 marks

Award **one** AO2 mark for each description of a relevant communication tool, to a maximum of **three** marks.

Award **one** AO3 mark for each explanation of how each tool will allow the business to meet client needs, up to a maximum of **three** marks.

- Shared online workspaces allow teams to store documents and other resources in a common area on a network so they can be accessed by the whole team, (AO2 1) this allows the team to edit common copies of the documents and they are able to see each other's work and make edits to provide information that clients need. (AO3 1)
- Discussion threads are an online chat facility where multiple users can make comments or ask questions on a specific topic, (AO2 1) this means that the needs of clients can be discussed and plans formed with multiple colleagues having input into this discussion, leading to more sophisticated discussions resulting in better quality plans. (AO3 1)
- Video conferencing allows members of the teams to have face-to-face online meetings, even when they are all working from different locations, (AO2 1) this allows interactive discussions of clients' needs, allowing multiple team members to have an input, leading to thorough development of the plans. (AO3 1)
- Mark-up tools allow multiple members of the team to make comments on shared documents, (AO2 1) highlighting areas that might need improvement or adding suggestions for content that needs to be updated, this allows for more detailed development of the plans for coaching clients, adding suggestions based on their experiences with other clients in similar situations. (AO3 1)

**Section B: Legislation and security**

**Total for this section: 35 marks,  
plus 3 marks for QWC**



<b>8</b>	<b>Which one of the following is an example of confidential human resource information?</b>	
	<b>A Access codes</b>	
	<b>B Email accounts</b>	
	<b>C Medical information</b>	
	<b>D Profit margins</b>	
		[1 mark]

AO1 = 1 mark

Award **one** mark for correct response:

**C** Medical information

<b>9</b>	<b>Describe two requirements of the Health and Safety at Work Act 1974.</b>	
		[2 marks]

AO1 = 2 marks

Award **one** mark for each description of a key requirement from the **Health and Safety at Work Act 1974**, up to a maximum of **two** marks.

- The law requires employees to have adequate training to ensure that they are able to complete their duties safely. (1)
- There must be adequate welfare provision at work such as the proper provision of protective equipment/breaks. (1)
- A safe working environment must be maintained, for example, by maintaining equipment so that it does not pose a risk of injury to workers. (1)
- Workers must be provided with information that they need to be able to do their jobs safely, for example, on faults with equipment. (1)

Accept any other suitable response.

**10** EL Fruit Ltd recently had to dismiss an employee who had stolen money from a client. This was possible because the employee had used confidential data that they had access to in order to do their job. The employee chose to steal the data and misuse it.

**Explain the way that two functions of criminal law protect the clients of companies like EL Fruit Ltd.**

[4 marks]

AO1 = 2 marks

AO2 = 2 marks

Award **one** AO1 mark for each description of a function of criminal law, up to a maximum of **two** marks.

Award **one** AO2 mark for each explanation of how the functions of criminal law protect the clients of businesses like EL Fruit Ltd, up to a maximum of **two** marks.

- Criminal law provides predictability, letting people know what to expect from others. (AO1 1) These rules make it clear when people have acted inappropriately. For any person found to be in breach of this there are clear consequences, such as dismissal for the employee of EL Fruit Ltd who stole the money from the client. (AO2 1)
- Criminal law protects individuals and their property by defining specific circumstances in which a person can and cannot use or take possession of someone else's belongings. (AO1 1) The employee of EL Fruit Ltd needed access to the confidential data to do their job but chose to misuse this for personal gain. This means that when clients find their money is missing, they are able to refer to these rules to confirm that the money should not have been taken from them. (AO2 1)

Accept any other suitable response.

**11** Neal's Barn is a company that stores data securely for clients. The business operates a server farm where data can be uploaded. The data is stored on systems that use strict backup routines. These routines make sure the data is protected from accidental backups and from unforeseen events such as power failures.

**The company has accredited the processes that it uses to protect data against International Organization for Standardization (ISO) standards. The managers of the firm publicise this on their website and in press releases.**

**Describe two ways that ISO standards benefit a business.**

**Explain how each of these benefits can help a business such as Neal's Barn to attract new customers.**

[4 marks]

AO2 = 4 marks

Award **one** mark for each description of a way that ISO standards benefit a business like Neal's Barn, up to a maximum of **two** marks.

Award **one** mark for each linked explanation of a way that these benefits will help the business to attract new customers, up to a maximum of **two** marks.

- ISO standards are recognised around the world and are well respected by a range of different organisations (1) meaning that potential clients can have confidence in processes used by Neal's Barn because they meet the highest international benchmarks. (1)
- ISO accreditation means that a business must embed a quality management system within their business leading to reductions in costs, (1) this efficiency will attract customers who are more confident in a business that has robust systems for managing the quality of their operations which will give them confidence that it is well managed and thus a safe place to store their data. (1)
- ISO accreditation indicates a company with a strong quality culture which is focussed on continuous improvement, (1) this will be attractive to potential clients who will value the dynamism of a business that is always improving the standards of its operations. (1)

**12 C.S.A. Digital is a business that provides digital advertising services to clients. A member of staff recently tweeted details of a new product before it was launched. This product was a major line produced by a very lucrative client. The client has told C.S.A. Digital that this was confidential information that should not have been shared.**

**Discuss one financial consequence of not maintaining confidentiality for C.S.A. Digital.**

[6 marks]

AO1 = 1 mark

AO2 = 2 marks

AO3 = 3 marks

Award **one** AO1 mark for identifying a financial consequence.

Award **one** AO2 mark for linking this financial consequence to C.S.A Digital, and a further mark for development in context, up to a maximum of **two** marks.

Award **one** AO3 mark for each discussion point relating to the impact of the financial consequence on C.S.A Digital, up to a maximum of **three** marks.

- Failing to maintain confidentiality breaches the law and could lead to fines (AO1 1) as a result of an investigation by regulators such as the data commissioner's office who would

regulate C.S.A. (AO2 1) leading to a loss of productivity as staff cooperate with the investigation (AO2 1) creating extra costs/a loss of income (AO3 1) and ultimately, the investigation can lead to negative publicity in addition to fines, (AO3 1) undermining the profitability of the business by increasing costs leading to lower profit. (AO3 1)

- Regulatory fines could be imposed if the revelation of information broke the rules imposed by the industry body. (AO1 1) The level of these fines will depend on the severity of the breach by C.S.A. (AO2 1) and whether it was preventable/the result of deliberate behaviour by the staff member who sent the tweet (AO2 1). The fines imposed may be relatively small in proportion to C.S.A.'s revenues (AO3 1) leading to relatively little impact on the profits made by the business, (AO3 1) especially if the fines are lower than compliance costs. (AO3 1)
- Refunds may have to be given to customers as a gesture of good will so that the client is less likely to leave the business (AO1 1) which may severely reduce the profits made on the contract or even lead to a loss being made in the short-term (AO2 1) as this was a major client, representing a large amount of business (AO2 1). It is possible that the client who feels their contract was breached may not return to the business in the future (AO3 1) suggesting that the potential loss of revenue would be substantial (AO3 1) leading to a significant loss of profits. (AO3 1)
- There may be a loss of earnings (AO1 1) as this was a very public incident, which may have led to negative media coverage (AO2 1) which will have been noticed by other companies (AO2 1), making them reluctant to hire C.S.A. (AO3 1). This would potentially lead to a loss of profits, but it would be hard to measure the size of this loss (AO3 1) because the company would not be aware of how many companies decided not to engage their services as a result. (AO3 1)

Accept any other suitable response.

13	<p><b>Lansing Bros is a company that sets up secure network servers for international companies. The servers allow these companies to safely share and store data that is used in offices around the world. Lansing Bros has recently launched a project to create a staff network for their own office to allow faster and more efficient communication between their teams. The management are concerned that the system needs to be resilient to technical threats.</b></p> <p><b>Describe how botnets and malware could affect the new network at Lansing Bros.</b></p> <p><b>Explain two ways in which each technical threat could impact on the operations of the business.</b></p> <p style="text-align: right;"><b>[6 marks]</b></p>
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AO2 = 2 marks

AO3 = 4 marks

Award **one** AO2 mark for each description of a technical threat, up to a maximum of **two** marks.

Award **one** AO3 mark for an explanation of the impact of each technical threat, up to a maximum of **four** marks.

- Botnets are distributed networks of computers that have been taken over by malicious actors who use software to remotely control those computers within the new network and can use them to carry out nefarious tasks (AO2 1) if a black hat hacker takes control of computers within the Lansing Bros' global network as part of a botnet utilising the company's bandwidth, (AO3 1) this could lead to network capacity being used for unintended purposes, slowing communication between staff within different countries. (AO3 1)
- Malware could be used on computers within the new network in order to log keystrokes or log in data (AO2 1) this would allow malicious individuals or groups to harvest sensitive client data from Lansing Bros' global offices or possibly network credentials (AO3 1), leading to the risk of confidential material that should be securely held on their network falling into the wrong hands. (AO3 1)

Accept any other suitable response.

<b>14</b>	<p><b>Sampat Data Solutions is a business that offers researchers access to a database of news articles. Users pay an annual subscription to be able to search the database. They can pay higher fees if they want to run larger numbers of queries. Sampat Data Solutions is planning to launch a new service allowing users to search a database of video footage of interviews with different public figures. The business has focussed on technical issues in the run up to the launch of the new service. The managers of the business are worried that non-technical factors will create a risk of the launch failing.</b></p> <p><b>Discuss the possible risk of non-technical factors causing the launch of the new service to be a failure.</b></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	AO3 <b>Justified</b> and <b>well supported</b> discussion of the ways in which non-technical factors can create a risk of the new product launch failing is <b>comprehensive, effective, relevant</b> , and <b>shows detailed understanding</b> and <b>logical and coherent</b> chains of reasoning throughout. Given conclusions are informed and are fully supported with rational and balanced judgements.

		<p>AO2 Applied all relevant knowledge of non-technical factors that can create a risk of the new product launch failing relating to the context and shows a <b>detailed</b>, functional understanding of digital operational integrity.</p> <p>AO1 A <b>wide range</b> of relevant knowledge and understanding of the factors which influence non-technical factors that can create a risk of the new product launch failing which is <b>accurate</b> and <b>detailed</b>. A wide range of appropriate technical terms are used.</p> <p>The answer demonstrates <b>comprehensive</b> breadth and/or depth of understanding.</p>
3	7–9	<p>AO3 <b>Mostly justified</b> and <b>supported</b> discussion of the ways in which non-technical factors can create a risk of the new product launch failing is in <b>most parts effective</b> and <b>mostly relevant</b>, showing <b>mostly logical</b> and <b>coherent</b> chains of reasoning. Given conclusions supported by judgements that consider most of the relevant arguments.</p> <p>AO2 Applied <b>mostly relevant</b> knowledge of non-technical factors that can create a risk of the new product launch failing relating to the context, showing <b>some</b> functional understanding of digital operational integrity.</p> <p>AO1 Knowledge and understanding of the factors which influence non-technical factors that can create a risk of the new product launch failing is in <b>most parts clear</b> and <b>mostly accurate</b>, although on occasion may lose focus.</p> <p>The answer demonstrates <b>reasonable</b> breadth and/or depth of understanding, with <b>occasional</b> inaccuracies and/or omissions.</p>
2	4–6	<p>AO3 <b>Partially justified</b> and <b>supported</b> discussion of the ways in which non-technical factors can create a risk of the new product launch failing is in <b>some parts effective</b> and of <b>some relevance</b>, with <b>some understanding</b> and reasoning taking the form of <b>generic statements</b> with some development. Given <b>brief</b> conclusions supported by judgements that consider only the most <b>basic</b> arguments.</p> <p>AO2 Applied <b>some, but limited knowledge</b> of, non-technical factors that can create a risk of the new product launch failing relating to the context and <b>may show a lack of functional understanding</b> of digital operational integrity.</p> <p>AO1 Knowledge and understanding of the factors which influence non-technical factors that can create a risk of the new product launch failing show some but <b>limited</b> accuracy, focus, and relevance.</p> <p>The answer is <b>basic</b> and shows limited breadth and/or depth of understanding, with inaccuracies and omissions.</p>
1	1–3	<p>AO3 <b>Unjustified</b> and <b>unsupported</b> discussion of the ways in which non-technical factors can create a risk of the new product launch failing is <b>minimal</b> and very <b>limited</b> in effectiveness and relevance. Given <b>tenuous</b></p>

		<p>conclusions that are unsupported and show <b>little relevance</b> to the question aims.</p> <p>AO2 Applied <b>general</b> knowledge and/or <b>general</b> assertions about non-technical factors that can create a risk of the new product launch failing with <b>little relevance</b> to the context.</p> <p>AO1 Knowledge and understanding of the factors which influence non-technical factors that can create a risk of the new product launch failing <b>shows very minimal accuracy, focus, and relevance</b>.</p> <p>The answer has isolated points, showing very <b>minimal breath and/or depth</b> of understanding, with <b>significant</b> 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 is used effectively.
2	The answer is generally clearly expressed and sufficiently structured. The rules of grammar are used with general control of meaning overall. A good range of appropriate technical terms is used effectively.
1	The answer lacks some clarity and is generally poorly structured. The rules of grammar are used with some control of meaning and any errors do not significantly hinder the overall meaning. A limited range of appropriate technical terms is used effectively.
0	<p>There is no answer written or none of the material presented is creditworthy.</p> <p><b>OR</b></p> <p>The answer does not reach the threshold performance level. The answer is fragmented and unstructured. The errors in grammar severely hinder the overall meaning.</p>

### Indicative content

#### AO1

- Employees may not follow policies and procedures.
- Competency levels of staff may lead to poor quality maintenance of the site.
- Poor cyber hygiene may lead to staff who have left the business not having their accounts archived.
- Physical security procedures may be insufficient to safeguard hardware used to host the database.

#### AO2

- Some staff may not follow procedures, for example, the business may have a system for gaining copyright approval for the content for their database.
- Unskilled staff may perform tasks badly leading to downtime which would undermine the reputation of the business.
- Poor cyber hygiene can leave former staff with access to systems leading to problems with unauthorised individuals having access to company systems.
- Insufficient physical security may create a situation where unauthorised individuals can access networked computers or servers leading to the risk that malicious individuals will be able to access computers and plug in memory sticks.

### AO3

- If staff do not follow procedures, then it may lead to content having to be removed and bad relationships with content owners which would lead to a lack of material, and this would put off people from signing up to the service.
- Downtime caused by staff errors will potentially lead to having to refund subscribers, leading to a loss of profits.
- Unauthorised access as a result of poor cyber hygiene which would lead to a risk of sensitive data being accessed by individuals who should not be able to access it.
- Malware could be installed as a result of poor physical security procedures leading to a risk of technical problems being introduced into the system.

Accept any other suitable response.



## Section C Digital analysis and data

**Total for this section: 42 marks,  
plus 3 marks for QWC**

<b>15</b>	<b>A location on a map is an example of which type of data?</b>
	<b>A Geospatial</b>
	<b>B Logical</b>
	<b>C Numeric</b>
	<b>D Temporal</b>
	[1 mark]

AO1 = 1 mark

Award **one** mark for correct response:

**A Geospatial**

<b>16</b>	<b>What is the characteristic of algorithms that involves repeating steps until a result has been achieved?</b>
	[1 mark]

AO1 = 1 mark

Award **one** mark for the correct answer:

- iteration.

<b>17</b>	<b>Zoffee sells exotic coffee drinks through a website. They use algorithms to analyse customer data to give them ideas on how to increase sales.</b>
	<b>Describe two ways that Zoffee can use algorithms for digital analysis.</b>
	[2 marks]

AO2 = 2 marks

Award **one** mark for each description of how Zoffee could use algorithms for digital analysis, up to a maximum of **two** marks.

- Zoffee could use algorithms to calculate the quantities of the different coffee being sold via the website to inform marketing strategies such as promotional campaigns to increase sales.  
(1)

- Machine learning can be applied to datasets allowing for powerful insights to be drawn from large datasets that might not be possible to find using traditional methods of analysis such as the optimum amount of coffee required to fulfil orders each day. (1)

Accept any other suitable response.

**18 House of Coding writes software for data analysis businesses. They have a large team of programmers who all work on a common code base for each project. Some new staff need to be retrained because they have been using bad practice in their coding projects, writing algorithms that contain ambiguous comments and variable names.**

**Discuss reasons why House of Coding managers insist that the steps in an algorithm should be unambiguous.**

**[4 marks]**

AO2 = 2 marks

AO3 = 2 marks

Award **one** AO2 mark for each valid discussion point relating to the creation of unambiguous algorithms within a business where teamwork is important, up to a maximum of **two** marks.

Award **one** additional AO3 mark for development of each discussion point relating to House of Coding, up to a maximum of **two** marks.

- When one member of staff at House of Coding writes comments or assigns variables to names that are ambiguous this can make it harder for other colleagues to debug and edit code. (AO2 1) Retraining new staff to move away from such bad practice will ensure the team will be able to understand and continue to work on the code without delay or disruption to the project. (AO3 1)
- If errors are found by another team member who is not familiar with the approach taken by their colleague this will result in inefficiency as it will take longer to work through code line by line to work out what different sections of the algorithm does (AO2 1). All staff work from a common code base which means it is necessary for colleagues to be able to understand the logic of one another's work in order to complete work on their own assignments. (AO3 1)

Accept any other suitable response.

**19 A to Z Digital Safety is a security company that uses algorithms to assess data on internet traffic patterns to detect unusual events and identify potential threats to the systems of their clients. They are training an apprentice in their office who is new to writing algorithms and have asked them to decompose a routine security task – looking for IP addresses from known hostile actors within records of network access. This data is stored on the office server.**

**Explain how the task of checking IP addresses against known threats could be decomposed.**

**[4 marks]**

AO1 = 2 marks

AO2 = 2 marks

Award **one** AO1 mark for a description of a stage in the process of checking IP addresses against known threats, up to a maximum of **two** marks.

Award **one** AO2 mark for developing an explanation of how the apprentice could decompose the problem they have been set, up to a maximum of **two** marks.

- The apprentice would need to plan their work, breaking down the problem into smaller steps, (AO1 1) such as processing the records of local network traffic data into a suitable data structure. (AO2 1)
- The apprentice would need to examine the data structures they will work with to identify the steps they need to take (AO1 1), allowing them to compare the contents of each data set to ensure the IP addresses that are known to be hostile are not accessing the network. (AO2 1)
- The apprentice would need to produce an algorithm that will open a file containing all of the known threats and convert them into a suitable data structure (AO1 1), allowing them to produce a report showing the results of the comparison which can be presented to the managers of A to Z. (AO2 1)

Accept any other suitable response.

**20 Franko's Eatery is a restaurant chain that operates at locations all over the UK. The company collects data on the products sold in its stores, on the dates and times of its sales, and on wastage of different raw materials.**

**The management of the company want to create an algorithm to analyse this data to give them ideas on how the business could be more efficient.**

**Identify two tools that could be used to design an algorithm.**

**Explain two ways in which each tool could be used to help design an algorithm to analyse the data.**

[6 marks]

AO1 = 2 marks

AO3 = 4 marks

Award **one** AO1 mark for the identification of a tool that could be used, up to a maximum of **two** marks.

Award **one** AO3 mark for each explanation of how an identified tool could be used to design an appropriate algorithm, up to a maximum of **four** marks.

- Decomposition diagrams could be used to break the task down into discrete stages, each of which relates to a different aspect of the task (AO1 1) which would allow the

design of a series of subroutines that deal with different parts of the analysis (AO3 1) and allow the coding to be divided into manageable blocks which can be assigned to different team members. (AO3 1)

- A flowchart shows the stages in the algorithm step by step highlighting the relationship between subroutines, and inputs and outputs (AO1 1) which will allow the exact sequence of steps in the algorithm to be visualised (AO3 1) making it easier to communicate the process to a non-technical audience at the design stage. (AO3 1)
- Pseudo code is a series of commands that resembles a high-level programming language but with greater readability to casual users (AO1 1) allowing a plan to be produced that could be understood by a wider audience while also being easy for coders to turn into an algorithm. (AO3 1) This is because the pseudo code language can be turned into actual code with relatively small modifications, simplifying the process of turning the design into a working program. (AO3 1)

Accept any other suitable response.

21	<p><b>Drakes Supplies is a company that sells birdwatching equipment to people. It runs a website and sends goods to clients via courier. It maintains a complex database containing details of customers, suppliers, stock, and sales.</b></p> <p><b>The database is relational and contains hundreds of thousands of records.</b></p> <p><b>Describe three characteristics of a relational database that could be used by Drakes Supplies.</b></p> <p><b>Explain how each characteristic could help the business to manage orders efficiently.</b></p> <p>[6 marks]</p>
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AO2 = 6 marks

Award **one** mark for a description of a characteristic of a relational database, up to a maximum of **three** marks.

Award **one** mark for linked development showing how the database will help manage orders, up to a maximum of **three** marks.

- Data is organised using normalisation to reduce redundancy leading to data that is not needed being removed (1), which will speed up the processing of queries on the Drakes Supplies database as there is less content relating to stock to process. (1)
- Data is connected by relationships meaning that key fields are used to connect records in different tables (1), meaning that information such as Drakes Supplies product details can be accessed from the relevant table and added to reports based on, for example, orders made by a specific customer. (1)
- Databases can be processed using SQL, allowing algorithms to be constructed to process the data in the different tables (1) and this will mean that key processes can be automated,

saving time for the business. (1)

Accept any other suitable response.

<b>22</b>	<p><b>Motorwell Car Services run a chain of car repair businesses. Each branch collects data on the sales that they make. This data is added to a database at head office. Data processing staff at head office process this data and produce visualisations to help directors understand the data.</b></p> <p><b>Outline three different methods of visualisation.</b></p> <p><b>Discuss how useful each of these visualisations are when company directors need to make decisions.</b></p> <p>[6 marks]</p>
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AO1 = 3 marks

AO3 = 3 marks

Award **one** AO1 mark for a relevant outline of a visualisation technique, up to a maximum of **three** marks.

Award **one** AO3 mark for a relevant discussion of how each visualisation can be used to support decision making, up to a maximum of **three** marks.

- Graphs can be used to give a simple visual guide to data, for example, time series data can be displayed in the form of a line graph. (AO1 1) This method is simple and easy to understand and is likely to make it easy to spot patterns or trends in data over time, allowing the best option for the business to be chosen based on identified trends. (AO3 1)
- Dashboards are interactive and allow managers to drilldown into specific sections of a dataset, looking at figures in granular detail (AO1 1). This allows managers to explore datasets and find additional detail when needed rather than just looking at headline data, allowing the company directors to be able to thoroughly investigate all appropriate options for the business before making a decision. (AO3 1)
- Infographics can make complex data simple and easy to understand, giving a quick visual reference to complex material (AO1 1), allowing those directors who are less numerate more opportunities to recognise and process key figures. This allows access for all company directors to make decisions that are significant to the success of the business. (AO3 1)

Accept any other suitable response.

23	<p><b>Manufacturing processes involve constant monitoring of statistical data to ensure that processes are meeting standards and that product quality is high. Rhino Tech Manufacturing make equipment for hikers such as GPS devices and battery packs for mobile phones. Their factory has recently been modernised and many digital systems have been set up to automatically collect data on different parts of the production process.</b></p> <p><b>Managers can use a dashboard that has live key performance indicator (KPI) data to make sure that standards are met. Previously, this data was only updated once a day.</b></p> <p><b>This data is regularly compared to targets. The quality of the products produced is important to keeping the business competitive.</b></p> <p><b>Analyse the impact of setting and monitoring KPIs for a business like Rhino Tech Manufacturing that aims to maintain high standards of quality.</b></p> <p style="text-align: right;"><b>[12 marks, plus 3 for QWC]</b></p>
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**AO1 = 4 marks**

**AO2 = 4 marks**

**AO3 = 4 marks**

Band	Mark	Descriptor
4	10–12	<p>AO3 <b>Justified</b> and <b>well supported</b> discussion of the ways in which setting and monitoring KPIs helps a manufacturing business maintain quality standards that is <b>comprehensive, effective, relevant</b>, and shows <b>detailed understanding</b> and <b>logical</b> and <b>coherent</b> chains of reasoning throughout. Given conclusions are informed and are fully supported with rational and balanced judgements.</p> <p>AO2 Applied all relevant knowledge of how setting and monitoring KPIs helps a manufacturing business maintain quality standards to the context and shows a <b>detailed</b> functional understanding of digital operational integrity.</p> <p>AO1 A wide range of relevant knowledge and understanding of the factors which influence setting and monitoring KPIs, and how these help a manufacturing business maintain quality standards, which is <b>accurate and detailed</b>. A wide range of appropriate technical terms is used.</p> <p>The answer demonstrates <b>comprehensive</b> breadth and/or depth of understanding.</p>
3	7–9	<p>AO3 <b>Partially justified</b> and <b>supported</b> discussion of the ways in which setting and monitoring KPIs helps a manufacturing business maintain quality standards that is in <b>most parts effective</b> and <b>mostly relevant</b>, showing <b>mostly logical</b> and <b>coherent</b> chains of reasoning. Given conclusions supported by judgements that consider most of the relevant arguments.</p> <p>AO2 Applied <b>mostly relevant</b> knowledge of how setting and monitoring KPIs helps a manufacturing business maintain quality standards to the context, showing <b>some</b> functional understanding of how setting and monitoring KPIs helps a manufacturing business maintain quality standards.</p>

		<p>AO1 Knowledge and understanding of how the factors which influence setting and monitoring KPIs help a manufacturing business maintain quality standards, is in <b>most parts clear</b> and <b>mostly accurate</b>, although on occasion <b>may lose</b> focus.</p> <p>The answer demonstrates <b>reasonable</b> breadth and/or depth of understanding, with <b>occasional</b> inaccuracies and/or omissions.</p>
2	4–6	<p>AO3 <b>Somewhat justified</b> and <b>supported</b> discussion of the ways in which setting and monitoring KPIs helps a manufacturing business maintain quality standards that is in <b>some parts effective</b> and of <b>some relevance</b>, with some understanding and reasoning taking the form of <b>generic statements</b> with <b>some development</b>. Given <b>brief conclusions</b> supported by judgements that consider only the most <b>basic arguments</b>.</p> <p>AO2 Applied some, but <b>limited knowledge</b> of how setting and monitoring KPIs helps a manufacturing business maintain quality to the context and <b>may show a lack of functional understanding</b> of digital operational integrity.</p> <p>AO1 Knowledge and understanding of how the factors which influence setting and monitoring KPIs helps a manufacturing business maintain quality standards, shows some but <b>limited accuracy, focus, and relevance</b>.</p> <p>The answer is basic and shows <b>limited</b> breadth and/or depth of understanding, with <b>inaccuracies</b> and omissions.</p>
1	1–3	<p>AO3 <b>Unjustified</b> and <b>unsupported</b> discussion of the ways in which setting and monitoring KPIs helps a manufacturing business maintain quality standards is minimal and very <b>limited</b> in effectiveness and relevance. Given <b>tenuous conclusions</b> that are <b>unsupported</b> and shows little relevance to the question aims.</p> <p>AO2 Applied general knowledge and/or general assertions about how setting and monitoring KPIs helps a manufacturing business maintain quality standards <b>with little relevance</b> to the context.</p> <p>AO1 Knowledge and understanding of how the factors which influence setting and monitoring KPIs helps a manufacturing business maintain quality standards shows <b>very minimal accuracy, focus, and relevance</b>.</p> <p>The answer has <b>isolated points</b>, showing very <b>minimal</b> breadth and/or depth of understanding, with <b>significant inaccuracies</b> 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 is used effectively.

Mark	Descriptor
2	The answer is generally clearly expressed and sufficiently structured. The rules of grammar are used with general control of meaning overall. A good range of appropriate technical terms is used effectively.
1	The answer lacks some clarity and is generally poorly structured. The rules of grammar are used with some control of meaning and any errors do not significantly hinder the overall meaning. A limited range of appropriate technical terms is used effectively.
0	There is no answer written or none of the material presented is creditworthy. <b>OR</b> 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

- Live updates of key performance indicators can help managers to monitor the extent to which processes are meeting required standards and this allows them to take action to address any changes that might indicate the risk of a problem before this becomes serious.
- Patterns and trends in KPI data can be tracked over time and this allows managers to identify issues, for example, if productivity or quality fall on a specific shift but not at other times, they can investigate the reasons for this and act.
- KPI data can be used as the basis for target setting, with the goals of managers linked to the different measures of performance.
- Understanding the performance and health of the business.

### AO2

- The usefulness of these measures will depend on how well-defined and how realistic targets are. If managers do not have appropriate quality goals, they may be holding staff to unrealistic standards and the quality KPIs may result in a lack of focus on core activities.
- The constant updating of measures may be problematic with staff becoming preoccupied with checking the quality data without doing proper analysis of the data.
- If staff see that their KPIs are always lagging behind quality targets, this may demotivate them and could actually reduce performance.
- KPI data may not be valid. The sensors used to gather data may not work and this may lead to a misleadingly pessimistic view of quality performance.

### AO3

- The monitoring and checking of operations data related to quality is vital to the efficient operation of the business and having valid and reliable figures in an accessible format will make management decision-making easier for staff.
- The usefulness of the KPIs will depend on how valid and reliable the data is – the methods used to collect the data must be accurate and fit for purpose or the KPI data may give a misleading picture of quality performance.
- KPIs are an objective measure of quality performance – staff can be confident that their performance is reviewed in a fair way that is free from bias.



- KPI data can be generated and monitored continuously, allowing for quality problems to be identified at an early stage meaning that they can be addressed before they escalate.
- KPI data can be used as a measure for quality improvement to identify areas of development for both processes and staff within the business, leading to improved products and services.

Accept any other suitable response.

### Assessment Objective Grid

Question	AO1	AO2	AO3	QWC	Total
1	1				1
2	2				2
3	1	1			2
4	1	1			2
5		3	3		6
6		2	2		4
7		3	3		6
8	1				1
9	2				2
10	2	2			4
11		4			4
12	1	2	3		6
13		2	4		6
14	4	4	4	3	15
15	1				1
16	1				1
17		2			2
18		2	2		4
19	2	2			4
20	2		4		6
21		6			6
22	3		3		6
23	4	4	4	3	15
<b>Total</b>	<b>28</b>	<b>40</b>	<b>32</b>	<b>6</b>	<b>106</b>



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