

T Level Technical Qualification in Digital Business Services

Core knowledge and understanding

Paper B

Mark scheme

v1.1: Specimen assessment materials 17 November 2023 603/6902/4

NCFE

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

The purpose of this mark scheme is to give you:

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

Marking guidelines

General guidelines

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

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

Guidelines for using extended response marking grids

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

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

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

Indicative content reflects content-related points that a student may make but is not an exhaustive list. Nor is it a model answer. Students may make all, some or none of the points

included in the indicative content as its purpose is as a guide for the relevance and expectation of the responses. Students must be credited for any other appropriate response.

Application of extended response marking grids

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

When determining a mark, your decision should be based on the quality of the response in relation to the descriptors. You must also consider the relative weightings of the 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: 21 marks
- 1 Identify which one of the following can test whether a system can function with expected demand by replicating real world load?
 - A Concept testing
 - **B** Penetration testing
 - C Stress testing
 - D White box testing

[1 mark]

AO1 = 1 mark

Award one mark for correct response.

C Stress testing

2 Describe two features of a dashboard.

[2 marks]

AO1 = 2 marks

Award **one** mark for each description of a dashboard feature up to a maximum of **two** marks:

- display / monitors key performance indicator (KPI) provides an overview of business performance which can be displayed as graphs/charts/ maps (1)
- management information is displayed to help make decisions based on the latest information (1)
- business intelligence is displayed to show important business metrics and performance (1).

3 Go Organic is a small organic food business that supplies products to a range of businesses.

Recently, there have been a range of complaints from clients. The most recent complaint was regarding food being spoiled due to incorrect expiry dates printed on cartons.

The company has decided to undertake a review of all customer complaints by using the root cause analysis process to identify the cause of these issues.

(a) Identify two stages in the root cause analysis process.

[2 marks]

(b) Explain how one stage in the root cause analysis process could benefit the business.

[2 marks]

AO1 = 2 marksAO2 = 2 marks

- (a) Award **one** (AO1) mark for identifying each stage within the root cause analysis process, up to a maximum of **two** marks:
- define the problem (1)
- collect information about the problem (1)
- identify possible causes (1)
- prioritise the cause (1)
- identify the problem (1)
- recommend and implement solutions (1)
- monitor and sustain (1).
- (b) Award **one** (AO2) mark for each part of an explanation of how one of the stages in root cause analysis could benefit the business up to a maximum of **two** marks.
- Management could define the problem with the wrong dates on the food following consumer complaints (1) and highlight the impact of this on business reputation (1).
- Management could collect information by collating the range of complaints that have been received from their systems (1) and analysing the wider impact of the complaints, such as lost business (1).
- The business could identify causes of why the wrong expiry dates were printed on cartons
 (1) which could help the business implement appropriate solutions, thus ensuring all
 future expiry dates are printed correctly (1).
- The business could prioritise the cause of the issue due to the amount of customer complaints (1) and because of the impact the issue is having on the consumer (1).
- Following analysis, the business would identify the issue causing the problem with the dates (1) and the amount of food affected by the problem (1).
- The business could recommend solutions to the problem which could involve recalling the affected products (1) and ensuring future products are correctly date stamped (1).

 The business could continue to monitor the measures implemented to ensure future products maintain correct date stamping (1) and collecting consumer feedback at regular intervals (1).

Accept any other suitable response.

- 4 Bling-Cash is a new financial services company. It has hired an ethical hacking team to carry out black box testing on a range of their systems, including its new security system designed to protect customer data.
 - (a) Define two characteristics of black box testing

[2 marks]

(b) Explain one reason why black box testing is important for Bling-Cash

[2 marks]

AO1 = 2 marksAO2 = 2 marks

- (a) Award **one** (AO1) mark for each characteristic of black box testing, up to a maximum of **two** marks:
- tests inputs and outputs against expected results (1)
- tests with no knowledge of the underlying code (1)
- testing is based on requirements and specifications (1).
- (b) Award **one** (AO2) mark for each part of a reason explaining the importance of black box testing on the financial business, up to a maximum of **two** marks.
- The ethical hacking team could use this type of testing to examine the financial system against external factors (1), identifying any weakness that could be used to disrupt Bling-Cash's network security (1).
- The ethical hacking team can use this form of testing to give an overview of the company's security software performance (1) and to help identify areas of vulnerabilities in the security system (1).
- As this company focuses on financial services, this form of testing will mitigate the risk of software failures at the user's end as solutions can be implemented prior to launch (1) ensuring system reliability. This results in the user having greater confidence, which is crucial in the finance sector (1).
- This will also allow the checking of any third-party payment software integrations ensuring they perform as expected (1) to make sure that Bling-Cash's users have a smooth and reliable user experience (1).

5 Oke Graphics is a small graphics design business that helps small to medium sized businesses with branding, web and logo design.

Oke Graphics has several small, specialised teams of individuals who focus on specific markets, such as retail or automotives. All staff work remotely, so it is important that any online file sharing is secure and easy to use, communication is effective between staff, and solutions are designed to meet the needs of the customers.

(a) Explain how the staff at Oke Graphics could use technology to collaborate and share business documents.

[2 marks]

(b) Discuss which tool would have the most impact on business.

[3 marks]

AO2 = 2 marksAO3 = 3 marks

- (a) Award **one** (AO2) mark for each part of an explanation of how technologies could be used by Oke Graphics to collaborate and share documents, up to a maximum of **two** marks.
- Video conferencing technology could be useful to share initial design ideas between staff and clients (1), and Oke Graphics could receive instant feedback from stakeholders to meet client design needs (1).
- Use of discussion threads would allow multiple remote working staff to collaborate on ideas for branding and design (1) allowing everyone's ideas to be incorporated to the final designs / strategies (1).
- Oke Graphics could use an online shared workspace to create / edit / store their work (1). This could enable other staff to carry out quality audits on each other's documents (1).
- Oke Graphics staff could use mark-up tools to label / highlight / make comments on documents (1) for easy improvements and updates to be made to meet client needs (1).
- (b) Award **one** (AO3) mark for each discussion point up to maximum of **three** marks.
- Video conferencing would have the most impact as it would allow lots of stakeholders to
 collaborate at the same time, which would allow flow of ideas (1). However, it might result
 in some quieter members becoming observers rather than actively contributing (1).
 Combining multiple technology tools, such as discussion threads with video, may result in
 higher impact and allow quieter team members to have input whilst allowing the flow of
 live video discussion to benefit decisions (1).
- Discussion threads would be most impactful because it would allow multiple staff, regardless of how vocal they were, to contribute to branding and design solutions (1). This would result in work being made up of diverse voices which might mean more impactful branding and design solutions (1). However, those with certain disabilities such as dyslexia. may be hindered from participating in discussion threads, therefore limiting contribution of some people (1).
- Mark-up tools would be the most impactful technology tool as it would enable comments which would allow documentation of decisions to be easily amended (1), and this means

documents would be of high quality and can be updated to meet client needs (1). This would result in better business performance as Oke Graphics wouldn't have to spend time on getting staff to redraft documentation (1).

Accept any other suitable response.

6 QWRT Insight is a market research agency that specialises in producing reports on the computer gaming and esports market.

The business collects data from a range of sources, such as key competitors in the industry, government reports, financial reports and social media; to generate reports regarding industry trends.

A client in esports has approached QWRT and asked them to compile a report that will help them to grow their recognition and reputation in the industry.

- (a) Explain one way QWRT Research could use analytics to inform their reports.

 [2 marks]
- (b) Discuss the impact of using analytics to compile their report for their client.
 [3 marks]

AO2 = 2 marksAO3 = 3 marks

- (a) Award **one** (AO2) mark for each part of an explanation of how QWRT Research could use analytics to inform their reports, up to a maximum of **two** marks.
- QWRT could use financial analytics tools to provide an in-depth insight into a businesses' financial status (1). Through analysing their cash flow, profitability and business value they can make suggestions on investments within the gaming industry (1).
- QWRT can use marketing analytics data to help a predict consumer behaviour and determine the return of investment (ROI) of marketing efforts (1). This will result in them having greater insight into game sales and how to increase their media presence (1).
- By using search analytics to search gaming data, the information collected can be analysed and used by QWRT to get a better understanding of the gaming and esports industry (1) allowing them to identify games and platforms that are currently in high demand (1).
- Social media data analysis can help QWRT better understand the demographics, needs and expectations of gaming customers (1) allowing them to understand how to grow social media presence for their client's target audiences (1).
- (b) Award **one** (AO3) mark for each part of the evaluative impact of the analytics, up to a maximum of **three** marks.

- The use of financial analytic tools may have a significant impact by helping the business to protect its market share or expand into new game genres (1). Financial analytics tools can also help competitors make informed decisions to try and stay ahead of their gaming competition by forecast gaming sales estimates (1), but due to the timescale for developing the games the information gained will be outdated quickly and can result in investments that don't provide a profitable return (1).
- Financial analytics / media analytics can provide business insight and intelligence into the business performance of the gaming industry, as it can help businesses make better strategic decisions (1). It can also help identify new trends and platform adoption whilst monitoring advancements in technology, which may provide gaming opportunities for the future (1). As the gaming sector is constantly evolving, relying too much on this data can result in developing game styles that have already reached market saturation (1).
- Social media data analysis may improve the efficiency of their customer service and market research carried out on social channels about gaming (1), which may lead to smarter investment in gaming product development / marketing to increase their competitive intelligence (1). Although this is data that can change quickly resulting in trends changing at a very fast pace (1).

Section B: Legislation and security

Total for this section: 38 marks, plus 3 marks for QWC

Identify three consequences to a business of a technical vulnerability.

[3 marks]

AO1 = 3 marks

7

Award **one** (AO1) mark for each identified consequence up to a maximum of **three** marks:

- loss of sensitive information (1)
- unauthorised access to systems or services (1)
- corruption of data and / or system (1)
- unauthorised access to restricted areas (1)
- essential security updates not installed (1).

Accept any other suitable response.

8 Justicy Bell is an online clothing retailer focusing on providing clothing that is accessible to all.

Recently, the business experienced a breach in its IT computer systems. Cardholder data was compromised, which affected the entire card payment system.

Customers were not able to make online payments and had to block their bank cards to protect against fraud.

The business needs to protect its customers against further attacks aimed at stealing customer credit card information.

(a) Identify both an industry standard organisation and legislation that address payment security.

[2 marks]

(b) Explain one way that either an industry standard organisation or legislation might protect payments from Justicy Bell customers.

[2 marks]

AO1 = 2 marks

AO2 = 2 marks

- (a) Award **one** (AO1) mark for the name of an industry standard organisation and a piece of legislation, up to a maximum of **two** marks.
- The Payment Card Industry Security Standards Council (PCI SSC) (1).
- Data Protection Act 2018 (1).

- (b) Award **one** (AO2) mark for each part of an explanation of how the industry standards or legislation for payments can protect Justicy Bells customers, up to a maximum of **two** marks.
- The Payment Card Industry Security Standards Council (PCI SSC) ensures that all
 customers will have their card data processed, stored and transmitted securely when
 making online purchases at Justicy Bell (1). This should reduce the risk of debit and credit
 card data loss at Justicy Bell (1).
- The Data Protection Act 2018 would protect Justicy Bell's customer data by ensuring it is handled securely whilst protecting it against unlawful and unauthorised processing or loss (1). By implementing policies and procedures for the processing of data, and training employees in this, Justicy Bell will ensure that customer data is secure (1).

9 Best Insure Ltd is a small call centre specialising in providing a range of insurance packages. They offer personal advice and bespoke packages to clients via the internet and phone.

Management has recently become concerned about the level of staff compliance with its policies, procedures, codes of conduct and absenteeism. This is having an impact on productivity and staff morale. It has also led to an increase in customer waiting times.

- (a) Identify two benefits to a business when they comply with legislation and regulation.
- (b) Explain one consequence to Best Insure's business of failing to comply with legislation and regulation.

[4 marks]

AO1 = 2 marksAO2 = 2 marks

- (a) Award **one** (AO1) mark for each identified potential benefit of compliance, up to a maximum of **two** marks.
- Compliance will enable protection for the business by introducing policies / procedures that help protect organisational data (1).
- Compliance with policies / procedures would ensure that customer personal information is protected (1).
- It would prevent a business receiving non-compliance related fines / penalties (1).
- (b) Award **one** (AO2) mark for each part of an explanation of the potential consequence of a non-compliant professional and the impact on the business, up to a maximum of **two** marks.

- If workers fail to comply with policies, this could result in Best Insure being subjected to legal consequences such as data protection fines (1). Such consequences could become publicly known, resulting in a loss of confidence and reputation with customers (1).
- If the worker continues to refuse to obey the rules and regulations after disciplinary action, this may lead to the termination of their employment (1), which would reduce the workforce of an already small call centre (1).
- Constant lateness and absenteeism may lead to their job responsibilities being reviewed (1)
 The business may have to suspend the employee under investigation for breach of contract which could cost Best Insure Ltd time and money (1).

10 Vedbet Art Studio is a graphic design business providing design solutions for financial institutions.

The company designs logos, brochures and advertisements for financial customers. It also designs posters to raise the awareness of their financial clients.

Discuss the importance of the Copyright Designs and Patents Act (1988) to Vedbet Art Studio and their clients.

[3 marks]

AO3 = 3 mark

Award **one** (AO3) mark for discussing the importance of the Copyright Designs and Patents Act (1988) up to a maximum of **three** marks.

- The Copyright Designs and Patents Act (1988) gives creators at Vedbet Art Studio the rights to control where their work is used and distributed which is highly important as it would prevent another company from using one of the logos designed by Vedbet without permission (1). This would ensure that designs featured at a client's business are likely to be consistently unique, contributing to a positive brand image (1), which would therefore improve the reputation of the financial client leading to increased customers (1).
- Though it is very important that the act enables Vedbet Art Studio's work to be protected from other companies copying their materials (1), it could result in costly court cases / criminal prosecution should copyright issues become evident, which will take up resources of Vedbet Art Studio (1). This could result in time being lost from spending time with clients and meeting their design requests (1).

11 Clifflers Clothing is an online sports shop that specialises in providing sports clothes for hiking, skiing, mountain climbing and biking.

Management has carried out a review of the company IT security and found issues with user access, misuse of IT infrastructure, code errors and plugin problems.

They concluded that the computer system security needed improvements to protect against cyber-attacks and security threats. They have been advised that confidentiality, integrity and availability (CIA), and identification, authentication, authorisation and accountability (IAAA) are key components required for an effective security system.

(a) Explain why CIA and IAAA are important considerations for the security system for Cliffler's Clothes.

[4 marks]

(b) Discuss the impact these elements of security would have on Cliffer's Clothes.

[3 marks]

AO2 = 4 marks AO3 = 3 marks

- (a) Award **one** (AO2) mark for each part of an explanation about why CIA should be included in a security system for Cliffer's Clothes up to a maximum of **two** marks.
- Setting CIA as goals in a Cliffler's Clothes security program for staff would be useful to ensure company data is kept safe and secure against growing cyberthreats (1) as it would help Cliffler's Clothes staff develop strong information security policies to be shared with staff (1).

Award **one** (AO2) mark for each part of an explanation about why IAAA should be included in a security system for Cliffer's Clothes up to a maximum of **two** marks.

- By using IAAA, each Cliffler's staff member has unique information that sets them apart from other staff users, which will identify them on Cliffler's Clothes management system (1), as part of the security check. This will allow the network security system to control who can have access to computer resources (1).
- (b) Award **one** (AO3) mark for each discussion point relating to the impact this would have in improving security, up to a maximum of **three** marks.
- Using IAAA would have a good impact on security as it would prevent unauthorised users
 accessing restricted material (1). Though it might take resources to set up this system,
 which might be costly to Cliffler's Clothes (1), it would provide an auditable trail whereby
 people who have accessed certain areas of the computer system can be identified (1).

• If management makes smart risk decisions and implements relevant security policies and procedures, it can reduce the costs associated with security breaches where external agencies may be required to intervene and fix issues (1). It may add value to the business by contributing to Cliffler's Clothes security reputation (1) as less downtime will make the company seem more reliable (1).

Accept any other suitable response.

12 Bricx is a business selling home-improvements. They have recently encountered several network problems. Their call centre staff cannot always connect to the internet, there have been virus issues and the current network systems appear to be under performing.

Bricx has recently approached a third-party organisation, L2 Margins, who specialise in network infrastructure to recommend security assurance processes

(a) Describe one process of security assurance that could be provided by L2 Margins to benefit Bricx.

[2 marks]

(b) Evaluate the importance of this process in providing security assurance for Bricx.

[3 marks]

AO2 = 2 marks AO3 = 3 marks

- (a) Award **one** (AO2) mark for each part of a description of a process of security assurance that could be provided by L2 Margins to benefit Bricx, up to a maximum of **two** marks.
- To improve internet connectivity for Bricx staff, L2 Margins could provide the installation and configuration of a firewall to monitor the inbound traffic allowed to the server (local host) from the network and internet (1), and an outbound firewall that monitors the traffic allowed to leave the server to the remote host (1).
- L2 Margins could carry out penetration tests on the Bricx network. These are simulated cyber-attacks to see whether it is possible to exploit any vulnerabilities in their client's system (1). This will determine whether unauthorised access or other malicious activity is possible and inform any mitigations and / or solutions (1).
- L2 Margins could use network monitoring as this will enable identification of malicious traffic by comparing IP addresses of devices and / or networks that are connecting to the client's network with a database of known dangerous addresses (1). This will allow measures to be put in place so that known dangerous devices or networks can instantly be blocked (1).
- L2 Margins may recommend network segregation to separate different departments and services (1); by doing this it will be easier to limit access to the network and restrict any potential damage done by a virus (1).

- (b) Award **one** (AO3) mark for each evaluative point evaluating the importance of an identified process in providing security assurance for the client, up to a maximum of **three** marks.
- Monitoring traffic could be considered highly important for Bricx's business as it would be
 easy to identify bottlenecks in the network / infrastructure, allowing them to plan for
 installation of infrastructure to reduce points of failure (1). Not doing this may lead to staff
 not being able to access the business network which could lead to downtime/lost revenue
 (1). However, this wouldn't resolve virus issues and therefore may not be considered the
 most important process of security assurance (1).
- Network segregation would be very beneficial to Bricx's business as it would allow the company to separate the network based on different departments. This would help them to manage user access required for a particular department which would improve system performance (1). As the company have also encountered problems with viruses, the segregation will decrease the amount of damage done by a virus or any other malicious attack (1). Although this would not directly help with the call centre staff and internet connectivity, it would allow the isolation of the issue for further investigation without affecting other departments (1).
- For improving internet connectivity, a firewall could be installed. It would help protect the
 network from viruses by monitoring network traffic in and out of the network. By blocking
 access to certain websites, it can reduce the chances of employees accessing a site that
 is infected with malware (1). As the system is underperforming there is potential that this
 could be due to the server being flooded and a firewall would help protect against this (1).
 It should also improve internet access, whilst improving security, which should help with
 the call centre encountering connectivity issues (1).



13 Monray Alarm Security Ltd specialises in domestic intruder alarms and CCTV.

All the security packages are designed around the home. Monray Alarm Security offers systems that link up to their Monray Smart Services App. All intruder and CCTV systems can be viewed via the app on all smart devices.

Monray Alarm security pride themselves on the following:

- 256-bit encryption so all customers data is safe
- fast response time satisfied customers
- safer meets smarter smart home security at fingertips.

Monray Alarm Security Ltd has recently suffered from some technical issues, which has meant customers have been unable to access the app. In addition, there have been some recent security breaches that have resulted in the loss of data and sensitive information.

Monray is looking at upgrading the security software on their Smart Services App in order to reassure customers that all data and information is secure. They also want to reassure customers that they have implemented a range of mitigation measures to prevent any further security breaches and that they are receiving the high-quality security services they expect from Monray.

Discuss the importance of risk mitigation controls that the business might use to prevent security risks to customers using the Monray Smart Services App.

[12 marks plus 3 for QWC]

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

Band	Mark	Descriptor
4	10–12	AO3 – Justified and well supported discussion of the importance of risk mitigation controls that the business might use to prevent threats to its digital systems is comprehensive , effective , relevant , and shows detailed understanding and logical and coherent chains of reasoning throughout. Discussion points are well informed and are fully supported with rational and balanced judgements.
		AO2 – Applied all relevant knowledge on the importance of risk mitigation controls that the business might use to prevent threats to its digital systems relating to the context and shows a detailed , functional understanding of digital operational integrity.
		AO1 – A wide range of relevant knowledge and understanding of the importance of risk mitigation controls that the business might use to prevent threats to its digital systems which is accurate and detailed . A wide range of appropriate technical terms are used.

Band	Mark	Descriptor
		The answer demonstrates comprehensive breadth and / or depth of
		understanding.
3	7–9	AO3 – Mostly justified and supported discussion of the importance of risk mitigation controls that the business might use to prevent threats to its digital systems is in most parts effective and mostly relevant , showing mostly logical and coherent chains of reasoning. Discussion points are supported by judgements that consider most of the relevant arguments.
		AO2 – Applied mostly relevant knowledge of the importance of risk mitigation controls that the business might use to prevent threats to its digital systems relating to the context, showing some functional understanding of digital operational integrity.
		AO1 – Knowledge and understanding of the importance of risk mitigation controls that the business might use to prevent threats to its digital systems is in most parts clear and mostly accurate , although on occasion may lose focus.
		The answer demonstrates reasonable breadth and / or depth of understanding, with occasional inaccuracies and / or omissions.
2	4–6	AO3 – Partially justified and supported discussion of the importance of risk mitigation controls that the business might use to prevent threats to its digital systems is in some parts effective and of some relevance, with some understanding and reasoning taking the form of generic statements with some development. Brief discussion points are supported by judgements that consider only the most basic arguments.
		AO2 – Applied some , but limited knowledge of the importance of risk mitigation controls that the business might use to prevent threats to its digital systems relating to the context and may show a lack of functional understanding of digital operational integrity.
		AO1 – Knowledge and understanding of the importance of risk mitigation controls that the business might use to prevent threats to its digital systems show some but limited accuracy , focus and relevance.
		The answer is basic and shows limited breadth and/or depth of understanding, with inaccuracies and omissions.
1	1–3	AO3 – Unjustified and unsupported discussion of the importance of risk mitigation controls that the business might use to prevent threats to its digital systems is minimal and very limited in effectiveness and relevance. Made tenuous discussion points that are unsupported and show little relevance to the question aims.
		AO2 – Applied general knowledge and / or general assertions about the importance of risk mitigation controls that the business might use to prevent threats to its digital systems with little relevance to the context.

Band	Mark	Descriptor				
		AO1 – Knowledge and understanding of risk mitigation controls that the business might use to prevent threats to its digital systems shows very minimal accuracy, focus and relevance.				
		The answer has isolated points, showing very minimal breath and/or depth of understanding, with significant inaccuracies and omissions.				
	0	No creditworthy material.				

Quality of written communication (QWC) = 3 marks

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

Indicative content

AO1 - Demonstrate knowledge and understanding of risk mitigation controls that can prevent threats, that may include:

- National Cyber Security Centre (NCSC) Cyber Essentials is a government backed scheme that would help to protect against the most common cyber-attacks.
- Anti-virus and anti-malware software to protect against system exploitation and viruses.
- Firewalls can provide protection against outside cyber attackers.
- Intrusion detection and prevention systems are used to mitigate attacks and block new threats.
- Through the encryption of incoming traffic there would be a reduction of security blind spots and better protection of data.
- The business could provide rules and guidelines on IT user access, policies and procedures.
- Staff training and continuous professional development so employees can improve knowledge regarding ransomware and phishing attacks.
- Backup and recovery is the process of creating and storing copies of data that can be used to protect against data loss.

AO2 - Application of knowledge and understanding of how risk mitigation controls could be used to prevent threats, that may include:

- Monray needs to be certified in cyber essentials so they can protect the business against cyber attacks and unwanted attention from cyber criminals. By gaining cyber essential plus certification, a full analysis of business compliance will be undertaken.
- Anti-malware and anti-virus can help block spam and pop-up ads, as well as protect against viruses. This can aid in protecting Monray against computer viruses and protect their customers data and files on the app.
- A firewall helps to protect a network and information by managing Monray's network traffic.
 This includes blocking unsolicited incoming network traffic and validating access by assessing network traffic for anything malicious like hackers and malware.
- The intrusion detection and prevention system will detect any malicious activity or violation that will be reported or collected centrally using a security information and event management system.
- Encryption of traffic allows for secure communications and it helps provide data security for sensitive information.
- When Monray staff do not follow IT policies, mistakes are made, processes are mixed up and employees get the wrong information.
- Staff training on cyber security can help employees understand the role they play in helping to combat information security breaches and make them feel motivated in their role within Monray.
- Backup and data recovery is important if Monray experiences inaccessibility of files and folders, unrecognised format, virus attacks, accidental deletions, permanent deletion of files, inaccessible partitions, corrupt documents, or unexpected system shutdowns.

AO3 - Justified and supported discussion of risk mitigation controls the business can use to prevent threats, that may include:

- By having certified staff, Monray can reassure their customers that they have staff in place
 with knowledge of cyber security, and that IT systems are secure. This may help to attract
 new business and reassure current customers that their data is secure. This will also allow
 Monray to bid for contracts that require cyber essential certification.
- Anti-virus software will protect the company's devices from viruses on the web. It will safeguard employees browsing activity, personal data and information about the company's clients and employees.
- If Monray does not have a firewall, then their business devices and infrastructure would be
 left exposed. This would allow hackers to potentially gain access and control computers
 within the network and the network itself. It is important that Monray have a firewall in place,
 as if hackers did gain control, they could lose customer loyalty as well as spending time and
 money having to recover any lost data.
- Intrusion detection and prevention systems will ensure IT personnel are notified when an attack or network intrusion might be taking place so they can block the unauthorised access.
- Encryption will help Monray safeguard their data and information from external and internal threats. Protecting this data is of key importance as it will help maintain their customer's reassurance regarding their security and prevent any data leaking.

- Employees not following IT policies can comprise operational performance; the noncompliance with the policy can lead to administrative actions up to and including termination of employment.
- Staff training can improve the security effectiveness of staff, increase morale and staff performance.
- Backup and recovery ensure that businesses, such as Monray, can quickly get back on their feet after a disaster, so they can avoid losing money due to extended downtime.



Section C Digital analysis and data

Total for this section: 44 marks, plus 3 marks for QWC

- 14 User engagement is an example of which type of data?
 - A. Customer
 - B. Employee
 - C. Financial
 - D. Marketing

[1 mark]

AO1 = 1 mark

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

D Marketing

Inacho Ltd are manufacturers of mechanical components for washing machines.

One of the automated systems is producing a component that is frequently failing quality tests and is causing a lot of waste.

The order of the processes is correct, and the system includes a selection process. Following an investigation, an engineer suggests that an iteration process is introduced.

Explain one reason why the engineer suggested the introduction of an iteration process.

[2 marks]

AO2 = 2 mark

Award **one** (AO2) mark for each part of an explanation of why the engineer suggested the introduction of an iteration process up to a maximum of **two** marks.

- Using an iterative approach, the washing machine will cycle through the available processes (1) allowing the engineer to identify when the component fails (1).
- The engineer could have suggested the iterative process due to there being a selection process (1) as this will allow the identification of successful tests (1).
- By suggesting the iterative process, correct selection processes can be identified (1) meaning just the unsuccessful machine selection processes can be repeated until resolved, therefore reducing any waste (1).

16 Dredgers is an electrical manufacturing company that operates across the UK. The company collects data on production times, material usage, operational costs, and waste material.

The company wants to create an algorithm to make their business operations more efficient. The aim is to enable fast responses to changes in the market and to become more productive and operationally resilient.

(a) Identify two processes of computational thinking.

[2 marks]

(b) Explain one way that Dredgers can use one of the processes of computational thinking when designing its new algorithm to benefit the company.

[2 marks]

AO1 = 2 marksAO2 = 2 marks

- (a) Award **one** (AO1) mark for **each** process of computational thinking, up to a maximum of **two** marks:
- decomposition (1)
- pattern recognition (1)
- abstraction (1)
- action (1).
- (b) Award **one** (AO2) mark for each part of a process explained for how Dredgers could use computational thinking when designing its new algorithm, up to a maximum of **two** marks.
- Dredgers could use decomposition diagrams to break down a complex problem or system into manageable components in the manufacturing process (1), which could help identify specific areas of operations that are under performing, such as the time taken to produce electrical goods on the production line (1).
- Dredgers could use pattern recognition which will help identify patterns and potential problems within all areas of their business operations to help them become operationally resilient (1); this can help prevent areas of disruption or threats to business and help management make better and / or more informed decisions (1).
- Dredgers could use abstraction to analyse their business information and data, such as production times, material usage, operational costs, and waste material, to help filter and remove problems that are not needed (1). This can help the business solve issues and improve the efficiency of its operations (1).
- Dredgers could use the action of computational thinking to ensure solid manufacturing processes are in place as this will analyse sequences / order of processes to ensure its selection only executes when conditions are met (1). This can help solve any operational issues and improve the performance across many other areas the business (1).

17 Ramley's Footwear sells fashionable shoes through a website. It uses a retail algorithm to predict future market demands and fluctuations to help them decide on the types of shoes to supply to its customers.

Describe two ways that Ramley's footwear can use algorithms to make predictions and the effect these may have on the business.

[4 marks]

AO2 = 4 marks

Award **one** mark for each description of how Ramley's Footwear could use algorithms to predict market demand and fluctuations in retail, up to a maximum of **four** marks.

- Ramley's Footwear can use algorithms to monitor changes in consumer spending (1) and this would help Ramley's Footwear to ensure they stock the right products (1).
- Ramley's Footwear can use retail algorithms to view consumers search queries (1), to identify what they are most likely to buy to ensure stock is available thus maximising sales (1).
- Ramley's Footwear can use algorithms to monitor customer baskets for abandoned purchases (1) to enable discounts to be offered and / or reminders be sent to encourage purchases (1).
- Ramley's Footwear can use algorithms to monitor consumer traits (1) allowing them to update stock to match target audience preferences (1).

Accept any other suitable response.

18 Benjamin's Software Solutions (BSS) focuses on the development of mobile applications and business websites. They have a large team of software engineers that work in small teams to design and develop software for their clients.

BSS offer a wide range of services including web design and development, app development, website hosting, graphic design, and bespoke software solutions

BSS believes that algorithms and data are key for the business to ensure the services they offer fully meet their client's needs.

(a) Explain one tool BSS could use for problem solving and algorithm design.

[2 marks]

(b) Evaluate the impact of this tool in relation to BSS' business decision making.

[3 marks]

AO2 = 2 marks

AO3 = 3 marks

- (a) Award **one** (AO2) mark for each part of an explanation of a tool for problem solving and algorithm design, up to a maximum of **two** marks.
- BSS could use a process decomposition diagram as it breaks any complex process down
 into well-defined steps, so BSS can make informed decisions about the products they are
 developing for their clients (1). It helps the software engineers find the optimal decomposition
 solution and could be used to generate the product specifications for its clients (1).
- The business may use a flowchart to provide a graphical representation of an algorithm with the help of different symbols and this could assist BSS staff with decision making (1).
 Flowcharts can be used by BSS software development teams as a panning tool to organise the project's step-by-step process in a visual way to help the software engineers solve complex business and design problems (1).
- BSS may use pseudocode as it can be used as a problem-solving tool for complex algorithms (1). Pseudocode is more efficient for larger programming problems. This can help the software engineers at BSS share ideas without spending too much time creating code and it provides a structure that is not dependent on any one programming language (1).
- (b) Award **one** (AO3) mark for evaluation of the impact of the tool relating to BSS up to a maximum of **three** marks.
- Pseudocode will have a great impact because it is a key component of an algorithm and helps the software development team plan of the structure of the program before they start to develop any code, making it understandable to everyone using it (1). However, this can be time consuming and only provides a plan of the program so will still require programming following this stage (1). Overall, using this technique will allow the software developers to understand the purpose of the program they are developing and may help them resolve problems prior to coding (1).
- Decomposition could be used by the software development team because it allows the
 algorithm to be broken down into smaller manageable chunks that can individually be
 resolved (1). However, this may not provide a full solution, rather a starting point for how it
 could be approached (1). Overall, this technique would help the team solve complex
 programming problems easier with each member of the team working on individual elements
 as required, or as a team if the problem is still too complex (1).

Jara is a personalised online shopping retailer. It selects five items for its customers to try on from home. Currently, they manually decide on clothing choice from talking to customers on the phone or viewing posted photos of customers. This has resulted in customers receiving clothing items not in the right size or styles and not within their spending budget, thus goods have been returned.

To increase the accuracy of their clothing selection, the company want to move to an automated system using an algorithm. To determine a better clothing selection, the user is required to input clothing size, style, age, gender and a budget spend on clothing.

Assess the suitability of using an algorithm in this scenario to improve customer experience.

[3 marks]

AO3 = 3 marks

Award **one** (AO3) mark for each relevant assessment point made in relation to the algorithm being suitable / unsuitable in supporting the accuracy of clothing selection and budget spending, up to a maximum of **three** marks.

- Application of the algorithm would be a suitable solution to reduce any potential bias in the
 decisions made about clothing selection (1) and it would calculate customers spending
 budgets to improve consistency, and therefore accuracy (1). This is likely to lead to happier
 customers as they are receiving appropriate clothing within their budget, thus improving the
 customer's relationship with Jara (1).
- Use of an algorithm may address certain aspects of issues being faced by Jara, such as sizing issues and budget which would minimise returns (1). However, using an algorithm may seem impersonal in comparison to Jara's current approach which may harm customer relations (1). A composite approach may be most suitable, combining accuracy of sizing / budget with a personal customer service interaction (1).
- Use of an algorithm would improve the customer experience by ensuring the correct size and style of clothing is sent to customers suggesting suitability (1). Use of an algorithm could further be extended into machine learning techniques that could be used to analyse choices and show more recommendations to customers (1). This could result in customers buying more products in a more efficient way based on the outcomes of analysis (1).

20 Mountain Data Centre UK Ltd is a hybrid cloud start-up company, providing cloud and networking services to help its clients reach their digital goals.

There are currently limited security access controls protecting sensitive documents, in addition to personnel and client data, stored both physically at the data centre and online.

Mountain Data Centre UK Ltd have recently bid for a government contract, whose data is highly classified.

Mountain Data Centre UK Ltd are required to demonstrate how they will minimise any risk to client data and increase access restrictions to authorised personnel.

(a) Describe three access control methods

[3 marks]

(b) Explain two ways that access controls could improve security at Mountain Data Centre UK Ltd.

[4 marks]

AO1 = 3 marksAO2 = 4 marks

- (a) Award **one** (AO1) mark for each type of access control method identified up to a maximum of **three** marks.
- Role-based access control (RBAC) also known as role-based security, is a mechanism that restricts system access (1).
- Attribute-based access control (ABAC) is a method that evaluates attributes (or characteristics), rather than roles, to determine who has access (1).
- Mandatory access control (MAC) restricts or allows access based on a hierarchy of security levels and all users are assigned a security or clearance level (1).
- Discretionary access control (DAC) is a type of security access control that grants or restricts object access determined by an object's owner group or subject (1).
- (b) Award **one** (AO2) mark for each part of an explanation of the access control methods that could help improve the business security, up to a maximum of **four** marks.
- Role-based access control (RBAC) would help protect government classified sensitive data
 by ensuring employees can only access information and perform actions they need to do
 their jobs based on their role (1). This method would be easier for them to manage, and less
 chance of errors normally associated with individually assigning permissions (1).
- Attribute-based access control (ABAC) would evaluate the attributes (or characteristics) of employee roles which would determine who has access to classified information (1). It would therefore protect classified data, network devices and IT resources from unauthorised users and actions to sensitive government data (1).

- Mandatory access control (MAC) would restrict users based on hierarchy of security levels, so each member of Mountain Data UK Ltd could only access resources that correspond to the security level equal to or lower than theirs in the hierarchy (1). This will restrict access to highly sensitive government data and offers a level of security usually associated with government (1).
- Discretionary access control (DAC) would grant or restrict access determined by an employee's owner group or subject (1). This is the most flexible method, allowing users to set access parameters for each resource, which would allow transfer of authenticated objects or information to other users that require access to the government data (1).

21 Raddlom Climate Change research centre monitors data on temperature changes, sea levels and greenhouse gas emissions on behalf of the government's Department for Environment, Food and Rural Affairs (DEFRA).

This data is collected by researchers from a range of sources. The data is then cleaned and formatted into a suitable presentation method. This data will be presented to DEFRA to help make informed decisions about pollution levels, conservation levels, water management and measure economic impacts in particular geographical areas. The environment department will use this data to support the government in implementing or changing current environmental policies.

(a) Give two ways Raddlom could present data to the environmental department to influence decision making.

[2 marks]

(b) Compare which of the two data presentation methods in 21(a) would influence decision making most effectively.

[4 marks]

AO2 = 2 marksAO3 = 4 marks

- (a) Award **one** (AO2) mark for describing each method of presenting data to the environment department, up to a maximum of **two** marks.
- Raddlom could present pollution levels data as a chart and / or graph (1).
- Digital slides are a good way of presenting data to highlight any environmental trends (1).
- Reports could be used to highlight information about pollution, conservation, water and economic impact (1).
- (b) Award **one** (AO3) mark for a relevant comparison of how each presentation method can influence DEFRA's decision making, up to a maximum of **four** marks.

- As data is being presented to DEFRA, graphs are likely to be most effective in comparison to
 written reports as they are easily visualised allowing DEFRA to easily visualise any changes
 (1). If DEFRA is comparing temperature changes, sea levels and greenhouse gas emissions
 data, a graph will easily allow them to visualise how each is performing and any links
 between them. (1). However, a written report may contain more detail and elaboration on
 problem areas which may be seen as more thorough (1). However, the effectiveness of each
 presentation method could be disputed dependent on the situation with graphs being more
 suitable as part of a vocal presentation whereas a report might be more appropriate for
 longer term assessment (1).
- Presenting a graph will allow DEFRA to better identify any patterns such as specific times
 where pollution levels are high (1). This can be compared against other historic data, to
 establish a cause and visualise the impact (1). This data could be more easily understood
 than a report, which may take longer to understand and therefore implement actions (1).
 However, a report would be more detailed and allow more time for DEFRA to read and ask
 more meaningful questions following a greater understanding (1).
- Use of infographics may have high impact due to their aesthetic appeal (1) but may be quite simplistic in terms of understanding the causes as these are usually targeted at a consumer level and just focus on key points (1). Use of a report may be more appropriate when implementing strategies as it would allow data to be understood in more depth allowing appropriate responses from the government (1). A report is also a more formal approach that is expected at this level as information can be read at a time to suit the reader rather than an infographic, which just focuses on key data points but doesn't provide any depth (1).



A private healthcare company has experienced issues with the data entry skills of staff responsible for entering medical data. It enlists a private training provider to deliver tailored training to new and current staff in data entry and systems maintenance.

Discuss the importance of including data entry and maintenance training to the private healthcare company's new recruits.

[12 marks plus 3 marks QWC]

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

Band	Mark	Descriptor
4	10–12	AO3 – Justified and well supported discussion of the importance of data entry and maintenance training and how it will upskill employees and benefit the business is comprehensive , effective , relevant , and shows detailed understanding and logical and coherent chains of reasoning throughout. Discussion points are informed and are fully supported with rational and balanced judgements.
		AO2 – Applied all relevant knowledge of data entry and maintenance training relating to the context and shows a detailed , functional understanding of digital operational integrity.
		AO1 – A wide range of relevant knowledge and understanding of the importance of data entry and maintenance training and how it will upskill employees and benefit the business which is accurate and detailed . A wide range of appropriate technical terms are used.
		The answer demonstrates comprehensive breadth and / or depth of understanding.

Band	Mark	Descriptor		
3	7–9	AO3 – Mostly justified and supported discussion of the importance of data entry and maintenance training and how it will upskill employees and benefit the business is in most parts effective and mostly relevant, showing mostly logical and coherent chains of reasoning. Discussion points are supported by judgements that consider most of the relevant arguments. AO2 – Applied mostly relevant knowledge of the importance of data entry and maintenance training and how it will upskill employees and benefit the business relating to the context, showing some functional understanding of digital operational integrity. AO1 – Knowledge and understanding of the importance of data entry and maintenance training and how it will upskill employees and benefit the business is in most parts clear and mostly accurate, although on occasion may lose focus.		
		The answer demonstrates reasonable breadth and / or depth of understanding, with occasional inaccuracies and / or omissions.		
2	4–6	AO3 – Partially justified and supported discussion of the importance of data entry and maintenance training and how it will upskill employees and benefit the business is in some parts effective and of some relevance, with some understanding and reasoning taking the form of generic statements with some development. Brief discussion points supported by judgements that consider only the most basic arguments.		
		AO2 – Applied some , but limited knowledge of the importance of data entry and maintenance training and how it will upskill employees and benefit the business relating to the context and may show a lack of functional understanding of digital operational integrity.		
		AO1 – Knowledge and understanding of the importance of data entry and maintenance training and how it will upskill employees and benefit the business show some but limited accuracy, focus and relevance.		
		The answer is basic and shows limited breadth and / or depth of understanding, with inaccuracies and omissions.		

Band	Mark	Descriptor
1	1–3	AO3 – Unjustified and unsupported discussion of the importance of data entry and maintenance training and how it will upskill employees and benefit the business is minimal and very limited in effectiveness and relevance. Given tenuous conclusions that are unsupported and show little relevance to the question aims. AO2 – Applied general knowledge and / or general assertions about the importance of data entry and maintenance training and how it will upskill employees and benefit the business with little relevance to the context.
		AO1 – Knowledge and understanding of the importance of data entry and maintenance training and how it will upskill employees and benefit the business shows very minimal accuracy , focus and relevance . The answer has isolated points, showing very minimal breath and / or depth of understanding, with significant inaccuracies and omissions.
	0	No creditworthy material.

Quality of written communication (QWC) = 3 marks

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

Indicative content

AO1 – Demonstrate knowledge and understanding of data entry and maintenance training that could include:

- The use of correct data entry using the correct data types for input boxes such as patients date of birth.
- Reducing the risk of data entry errors using validation and verification checks.
- Ensuring data privacy compliance with standards and legislation.
- Individual users maintaining their own data, using editable data screens for permitted data changes to healthcare information.

- In the healthcare company, the staff administrators will have the rights to change data at user, group or file level on the computer systems.
- Correct use of business resources can improve operations, financial and technology services
 of the healthcare company.

AO2 - Application of knowledge and understanding of how data entry and maintenance will benefit the business and employees that could include:

- Training in data entry will help healthcare staff understand the methods for locating, accessing and retrieving healthcare information.
- Training about validation checks would ensure that staff use the correct pin number or computer key to access secure healthcare data and that all data is verified to check the correct patient information is processed accurately.
- Healthcare staff should receive regular training on General Data Protection Regulation (GDPR) to ensure all data is confidential, secure, only shared for business purposes and has restricted staff access to data.
- By giving healthcare professionals the ability through training to make changes to data this
 will increase efficiency and productivity in staff jobs and increase staff satisfaction.
- Staff administration training will ensure data can be collected from different sources, including medical records, patient surveys and other administrative databases.
- Healthcare staff who are trained efficiently in using business resources will be more confident in the use of healthcare systems and manage their time more effectively.

AO3 - Justified and supported discussion of how data entry and maintenance training can be used to prevent compliance issues, that may include:

- Data entry training is important as it upskills staff on accessing and managing the healthcare data electronically, streamlining operations and rendering better patient care.
- If all staff are trained effectively on verification and validation this can help reduce business costs and improve software performance.
- Staff training can guarantee that data is protected at all times and is not exposed to risks and vulnerabilities like unauthorised access, processing, sharing and disclosure outside of the healthcare company.
- It is important that the systems administrator keeps all data accurate and maintains the effective operational provision of all IT access and changes to the healthcare systems.
- Effective use of business resources can help to improve the performance of the business, reduce business costs and increase employee engagement.
- Training could be considered very important as inaccurate medical information being input could be detrimental to the healthcare setting as this might lead to incorrect treatment and procedures leading to legal action and ill health of the public.
- Though training could be considered important, it may be time consuming / expensive to the healthcare company.

Assessment Objective Grid

Question	AO1	AO2	AO3	QWC	Total
1	1				1
2	2				2
3 (a)	2				2 2
3 (b)		2			2
4 (a)	2				2
4 (b)		2			2 2 2 3
5 (a)		2			2
5 (b)			3		3
6 (a)		2			2
6 (b)			3		3 3 2 2 2 2
7	3				3
8 (a)	2				2
8 (b)		2			2
9 (a)	2				2
9 (b)		2			2
10			3		3 4
11 (a)		4			4
11 (b)			3		3
12 (a)	,	2			3 2
12 (b)			3		3
13	4	4	3	3	15
14	1				1
15		2			2
16 (a)	2				2 2 2
16 (b)		2			2
17		4			4
18 (a)		2			2
18 (b)			3		3
19			3		3 3 3
20 (a)	3				3
20 (b)		4			4
21 (a)		2			2
21 (b)			4		4
22	4	4	4	3	15

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Owner: Head of Assessment Design

Change History Record

Version	Description of change	Approval	Date of Issue
v1.0	Additional sample materials		November 2022
v1.1	Sample added as a watermark.	November 2023	17 November 2023

