

Mark Scheme

Question		Answer/Indicative content	Marks	Guidance
1	a	Any two from: • Touch Screen (1) • Portable/ Lightweight (1) • Battery (1) • Includes connectivity capabilities (1) • Input options / onscreen keyboard / stylus / touch (1) • Includes a camera (1) Credit any other appropriate response.	2 (PO1)	One mark for each correct answer. Max two marks
	b	Up to two marks for an explanation: e.g.: • Assigns a unique identifier / IP address (1) to each device connected to a network (1) • To decompose data packets / make data packets smaller (1) before they are sent over a network (1) • To label packets with header information / e.g. source and destination IP addresses (1) to ensure correct transmission across a network (1) • To route packets via the most optimal route (1) from the source to destination (1) Credit any other appropriate response.	2 (PO1)	Up to two marks for an explanation of the role of the IP.

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	c		One mark for identifying a risk of a botnet to the dentists. Up to two marks for a valid description. e.g.: • Distributed Denial-of-Service (DDoS) Attacks (1) ◦ traffic (1) meaning the public / dentists cannot access the website (1) so cannot download the survey (1) • Credential Stuffing (1) ◦ Dentists log-in details can be compromised / stolen (1) which may lead dentists vulnerable to other accounts being compromised (1) • Spamming and Phishing (1) ◦ Spam / phishing messages can be sent through registered dentist user accounts (1) leading to fraud / personal data breaches. • Data Theft (1) ◦ Dentist sensitive data / payment details (1) Can be extracted and used to commit crimes / fraud / identity theft (1) • Hacking (1) ◦ Patient details accessed (1) harming reputation of dentists (1) Credit any other appropriate response.	3 (PO2)	The description must match the risk provided. Max three marks
	d		One from: • Denial of Service (DOS)/Distributed Denial of Service (DDoS) (1) • Hacking (1) • Lack of supplier support (1) • Malicious spam (1) • Malware (1) • Out of date Software / Hardware / Firmware (1)	1 (PO1)	One mark for each correct answer. Max one mark
			Total	8	

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2	a	Up to two marks for an explanation of a disadvantage of the development team using the partner API. One mark for identifying a disadvantage One mark for further details e.g.: Dependency on Third-Party Providers (1) - the development of the secure area of the website will rely on availability and reliability of the API provider. (1) - If the API experiences downtime or disruptions, it can negatively impact the development. (1) Limited Customisation (1) - the partner APIs may not always align perfectly with the developments team requirements leading to limited flexibility (1) Security Risks (1) - if the API provider does not follow best practices for data protection then the risk of a security breach can increase (1) Performance Issues (1) - The API may have rate limits or latency issues, which can slow down the development of the website (1) Credit any other appropriate response.	2 (PO2)	Max two marks

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	b		Up to two marks for one advantage to the development team of the API using REST architecture One mark for identifying the advantage. One mark for saying how the advantage affects the development team e.g.: • Simplicity / Ease of Use (1) the development team does not have to install any specialized software to access the secure webpage during development (1) • Flexibility/ Compatibility (1) developers can use a range of platforms / e.g web browsers / mobile to develop the secure webpage (1) • Increased Security (1) REST uses standard HTTP which means security measures can increase security of development team data / log-in details (1) • Statelessness (1) servers can handle requests quicker/ simpler implementation. (1) • Scalability (1) REST allows intermediate servers enhancing reliability (1) Credit any other appropriate response.	2 (PO2)	Max two marks
	c		Any one from e.g.: • Simple Object Access Protocol / SOAP (1) • Remote Procedure Call / RPC (1) • Google Remote Procedure Call/ gRPC (1) • GraphQL (1) • WebSockets (1) Credit any other appropriate response.	1 (PO1)	One mark for each correct answer. Max one mark.
			Total	5	

Mark Scheme

Question		Answer/Indicative content	Marks	Guidance
3	a	Up to two marks for a description of the purpose of testing e.g.: • To identify and fix defects or issues (1) to maintain a high standard of quality (1) • Confirms that the product performs reliably under different conditions and workloads (1) to increase reliability / performance (1) • Ensures the product meets user needs and provides a positive experience (1) to enhance User Satisfaction (1) • Ensures product conforms to legal / regulatory / industry standards (1) to ensure compliance (1). • Cost Efficiency (1) Early detection of issues reduces the cost of fixing them later in the development cycle (1) • Continuous Improvement (1) Testing provides insights for refining and optimizing processes or systems (1) Credit any other appropriate response.	2 (PO1)	Up to two marks for a purpose of testing
	b	Any two from: • Test number (1) • Test type (1) • Test description (1) • Test data (1) • Expected result (1) • Actual result (1) • Remedial action required (1) • Retest result (1)	2 (PO1)	One mark for each correct answer. Max two marks. Accept equivalent wording

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	c	Level 3 (high) 5-6 marks A thorough analysis, which includes: • identification of a range of advantages of carrying out user testing • detailed knowledge and understanding in the context of the question • clear explanation • consistent use of appropriate subject terminology. Level 2 (mid) 3-4 marks An adequate analysis, which includes: • identification of some advantages of carrying out user testing • sound knowledge and understanding in the context of the question • adequate explanation • some use of appropriate subject terminology. Level 1 (low) 1-2 marks A basic analysis, which includes: • identification of at least one advantage of carrying out user testing • limited knowledge and understanding in the context of the question • basic explanation • use of appropriate subject terminology is limited. 0 mark Answer is not worthy of credit.	6 (PO3)	Indicative content Answers may include some of the following: Examples of advantages of user testing • Improves Usability and User Experience • Could reduce risk of having to carry out remedial work when website is live • Validates Assumptions and Design Choices • Provides Insights into User Behaviour • Builds User Empathy • Feedback from customers/ users • Real world use/ scenario used so more realistic use/ results Analysis: • The website will be functional and accessible. • Leads to better design decisions relevant to the users / dentists • Increased chance of useful data being collected to meet user needs • Improved user satisfaction • A decrease in costs and risk. Credit other relevant analysis, points and examples.
		Total	10	

Mark Scheme

Question			Answer/Indicative content	Marks	Guidance
4	a		Up to two marks for an explanation of the purpose of a Use of Information policy One mark for identifying a purpose One mark for explaining the purpose e.g.: • User Trust (1) Builds trust by being open about data usage practices (1) • Accountability (1) Holds the organisation accountable for ethical data handling (1) • Transparency (1) ◦ Informs users about what data is collected and why (1) ◦ Explains how data will be used, stored, and shared (1) • Legal Compliance (1) ◦ Ensures adherence to data protection laws / GDPR / DPA (1) ◦ Details users' rights about their data (1) • Restrictions on Misuse (1) ◦ Specifies how collected data cannot be used (1) ◦ Prevents misuse by employees or third parties (1) Credit any other appropriate response.	2 (PO1)	Up to two marks for an explanation of the purpose of a use of information policy
	b		Any two from e.g.: • Application user guide (1) • Acceptable Use Policy / AUP (1) • Backup (1) • Codes of practice (1) • Staying safe online (1) Credit any other appropriate response.	2 (PO1)	One mark for each correct answer. Max two marks.
			Total	4	

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Question			Answer/Indicative content	Marks	Guidance										
5	a		<table><tr><td>Answers required</td><td>Data type</td></tr><tr><td>Given Name</td><td>One from: String (1) VarChar (1)</td></tr><tr><td>Age</td><td>Integer (1)</td></tr><tr><td>Contact Number</td><td>One from: String (1) VarChar (1)</td></tr><tr><td>NHS / Private</td><td>One from: Boolean (1) String (1) VarChar (1) ENUM (1)</td></tr></table>	Answers required	Data type	Given Name	One from: String (1) VarChar (1)	Age	Integer (1)	Contact Number	One from: String (1) VarChar (1)	NHS / Private	One from: Boolean (1) String (1) VarChar (1) ENUM (1)	4 (PO2)	One mark for each correct answer. Max four marks
Answers required	Data type														
Given Name	One from: String (1) VarChar (1)														
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Contact Number	One from: String (1) VarChar (1)														
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	b	Up to two marks for explaining one disadvantage to the dentists saving the completed surveys on a portable storage device. One mark for identifying the disadvantage. One mark for saying how the disadvantage affects the dentists e.g.: • Device can be lost (1) meaning the dentist will lose the survey which may be a data breach/ so cannot use the collected data (1) • Device can be stolen (1) causing data breach leading to legal issues (1) • Device can be infected with malware / viruses (1) which means any other device the portable storage device is plugged into may be infected (1) • Device can have limited storage capacity (1) meaning the dentist may have a limited number of completed surveys that can be saved/ needs multiple portable devices which adds costs/ security issues (1) • Data Corruption (1) Sudden removal or improper ejection can corrupt the data stored on the survey (1) • Compatibility Issues (1) Some devices may not support all file systems / newer devices require USB adapters so dentists may have to buy new devices / adaptors (1) • Slow Transfer Speeds (1) If the portable storage device uses an old USB version the surveys will take longer to save (1) Credit any other appropriate response.	2 (PO2)	Up to two marks max for a disadvantage to the dentists of using a portable storage device to save the completed surveys.
	c	Two actions for one mark each e.g.: • Remove patients' data when the research has finished (1) • Not use the data for any other purpose than it was collected for (1) • To only collect the data required by the survey (1) • To advise patients on what the data will be used for (1) • To not collect data if the patient refuses to take part (1) Credit any other appropriate response.	2 (PO2)	One mark for each correct answer. Max two marks. Do not accept: • Responses linked to keeping data secure – excluded in question

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			Total	8	
6	a		Data at rest is digital (1) information stored (1) on a device . (1) It remains in a stable (1) condition until it is accessed or changed.	4 (PO1)	One mark for each correct answer. Max four marks
	b		One from: • In transit (1) • In motion (1) • In use (1)	1 (PO1)	One mark for a correct answer. Max one mark.
	c		File Transfer Protocol (FTP) (1)	1 (PO2)	Correct Answer only
			Total	6	

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7			Up to two marks for explaining why a back-up should be taken One mark for identifying why a back-up should be taken One mark for saying how this can be applied to the survey e.g.: • The survey data can be quickly restored (1) so dentists do not have to resubmit surveys / ask patients to provide answers again (1) • Quickly get data back (1) as the completed survey data has not been lost (1) • An extra copy of the completed surveys (1) even if original destroyed/ stolen/ deleted data (1) • If website/ original data is attacked (1) the survey data is safe / protected / not harmed (1) Credit any other appropriate response.	2 (PO2)	Up to two marks max for an explanation of why a back-up should be taken.
			Total	2	

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8	a	Any two from e.g.: • Stored as plain text (1) • Individual data values are stored in a row (1) • Data values in each row represent individual columns (1) • The first row in a CSV file contains column names (1) Credit any other appropriate response.	2 (PO1)	One mark for each correct answer. Max two marks.
	b	Level 3 (high) 7-9 marks A thorough discussion which shows detailed evaluation, which includes: • a range of points from both sides of the argument • a detailed analysis in the context of the question • a clear conclusion(s) with detailed reasons/ justifications • consistent use of appropriate subject terminology. Level 2 (mid) 4-6 marks An adequate discussion which shows sound evaluation, which includes: • some points from both sides of the argument • some analysis in the context of the question • an adequate conclusion(s) with relevant reasons/ justifications • some use of appropriate subject terminology Level 1 (low) 1-3 marks A basic discussion which shows limited evaluation, which includes: • a few points from the argument • a limited analysis in the context of the question • a brief conclusion(s) with limited reasons/ justifications • use of appropriate subject terminology is limited 0 mark Answer is not worthy of credit.	9 (PO3)	Answers can include some of the following: Advantages: • Simple and Easy to Use – CSV files are plain text, so the scientists can edit the data with generic software. • Lightweight – the files will only contain the raw data without formatting or metadata, so scientists can analyse the data to meet their objectives • Smaller file size - CSV files are smaller in size compared to formats like Excel (.xlsx) so storage space can be saved • Compatible with Most Applications – A large range of applications can manipulate a CSV file so scientists are not restricted by software meaning they may not have to use / buy specific software packages • Enhances cooperation across scientists – many different scientists can use the data and compare the results of the analysis even if they are using different software applications. • Human-Readable – Because they are plain text, CSV files can be opened and understood by humans without special software. • Fast Processing – As there is no extra formatting, CSV files are quick to read and write, even for large datasets. Disadvantages: • Lack of Data Types – CSV files store everything as text, which can cause issues with numbers, dates, and special characters which may cause issue with analysis if there are specific requirements • No Standard Schema – There is no enforced structure, so different CSV

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					files may use different delimiters, encodings, or column orders. • Limited Support for Complex Data – Unlike databases or JSON, CSV files do not support nested or hierarchical data so complex analysis may not be possible unless scientists have good maths / programming skills • No Data Validation – CSV files do not enforce data integrity, making them prone to errors like missing values or inconsistent formatting, meaning the analysis of the data may be inconsistent / unreliable. • Encoding Issues – Special characters may cause encoding problems, especially if different systems use different character encodings Credit other relevant conclusions, points and examples.
	c		Two from: • American Standard Code for Information Interchange / ASCII (1) • Unicode (1) • Fixed width (1) • JavaScript Object Notation / JSON (1) • Extensible Markup Language / XML (1)	2 (PO1)	One mark for each correct answer. Max two marks.
			Total	13	

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9			Up to two marks for each advantage and disadvantage. One mark for identifying the advantage/ disadvantage. One mark for saying how the advantage/ disadvantage affects the scientists. Advantage e.g.: • Scientists can work in different organisations (1) and have access to the hybrid cloud without jeopardising sensitive business data (1) • Scientists can keep sensitive data and critical applications in the private cloud part of the hybrid cloud (1), ensuring compliance with industry regulations / e.g. DPA / GDPR (1) • Data can be easily replicated to the public part of the hybrid cloud (1) for quick recovery in case of an on-premises failure (1). Credit any other appropriate response. Disadvantage e.g.: • The transfer of data increases the risk of data breaches (1) meaning increase security / encryption / secure APIs is required increasing costs (1) • Survey data must be regulatory compliant (1) which can be complex if scientists / stored data are in different countries (1) • Latency may occur when survey data is being transferred leading to decreased performance (1) especially if the survey data is being accessed by multiple scientists at the same time (1) Credit any other appropriate response.	4 (PO2)	Up to two marks max for explaining one advantage Up to two marks max for explaining one disadvantage Max four marks
			Total	4	