Cambridge Assessment International Education

Cambridge International AS & A Level

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INFORMATION TECHNOLOGY **9626/12**

Paper 1 Theory **May/June 2024**

1 hour 45 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use an HB pencil for any diagrams, graphs or rough working.
- Calculators must **not** be used in this paper.

INFORMATION

- The total mark for this paper is 70.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **12** pages. Any blank pages are indicated.

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 Chapter 10: Database and Rle Concepts

1 A building company has a relational database. The database has two tables: CUSTOMERS and QUOTATIONS.

(a) The QUOTATIONS table has a foreign key.

Describe what is meant by the term foreign key.

- It is a primary key in another table
- is used to link relationships between tables

..... [2]

(b) **(i)** Define the term referential integrity.

- forces table relationships to be consistent

..... [1]

(ii) Explain why referential integrity is important.

- It avoids redundant data
- prevents of the deletion of related records
- data within the related fieds cannot be changed others
- It avoids orphan data

..... [3]

(c) Describe what is meant by the term relational database.

- Consists of more than one table — Information area } link
- Tables are linked to each other using key fields such primary key, foreign key, compound key
- Can create queries using more than one table
- Can create reports using more than one table

[5]

Chapter 2 - Hardware and Software

2 Describe how supercomputers are used for weather forecasting.

- Complex models are created
- Data is gathered by sensors
- Vast amount of data is collected
- Data is input into the model
- Vast number of calculations are carried out
- Data is collected from around the world
- Software can make predictions

offer

- Searches for a match in past conditions

[6]

 Chapter 6 - The digital divide

3 A government is concerned about the digital divide amongst its citizens.

Describe how the government could reduce the effects of the digital divide and improve access to its services.

- Digital divide is the gap between those who have to modern technology and information and those who are restricted
- Improve Communication Coverage to the internet
- Provision of training Services
- Provision of gadgets such as laptops (PC) to the school children
- Improve on infrastructure such as satellite technology
- Provision of public access to internet facilities

..... [6]

4 Data can be kept secure by using the Secure Socket Layer (SSL)/Transport Layer Security (TLS) protocols when it is transmitted over the internet.

Describe the use of SSL/TLS to ensure data is kept secure.

Useless to the hackers

- Transmitted data is encrypted so that anyone (third party) cannot understand the data
- only the user's computer and the secure receiving server can recognise the data
- SSL/TLS use two keys (private and public keys)
- The browser checks to see if the SSL/TLS certificate is trusted
- website often use (SSL/TLS) certificates to verify their authenticity
- If the SSL/TLS certificate is trusted, then the browser sends a message to the web server
- If the SSL/TLS certificate is not trusted, the browser will refuse to open the website and will display a message to the user
- SSL/TLS requires a handshake to be carried out

[8]

Chapter 1 - Data Processing and information

5 There are various methods of verification.

(a) Describe why checksum verification is used.

- To check that the data has been transmitted accurately
- It is used for the whole files of data

Other

- Provide a unique identifier for data

[2]

(b) Describe a method of calculating a checksum.

- Calculated using algorithms
- Use a hash function
- Adds number of bytes in a file

[3]

Chapter 5 - e Security

6 Describe these types of malware.

(a) Malicious bots

- replicate itself
- Infects series of Computers
- Bots are used to gather information
- Perform tasks that are normally undertaken by humans.

[4]

(b) Rootkit

- Install set of tools such as Key stroke logger
- Software designed to provide continued administrator access control to a computer
- They can access log files
- Root refers to the admin account on unix and linux systems

Other

- Kit refers to the software components that implement the attack
- Hides it's presence in the operating system without user awareness

[4]

(c) Virus

- Spreads from one computer to another
- They can corrupt files
- They can replicate
- They attach themselves to another program

Other

- Can cause the computer to crash or slow down the processing speed

[4]

7 Data can be collected by using a direct or an indirect data source.

Discuss the advantages and disadvantages of using direct data compared to indirect data.

- Direct data is a primary source while indirect data is a secondary source

Advantages
- Direct data source is reliable
- only specific data is collected
- The data collector only need to collect as much as needed
- Direct data is more up to date

Disadvantages
- The sample size may be small
- Original data may not be possible to collect because of the time of year
- Direct data can take a long time to collect
- Collecting direct data involves the expense of travelling

[8]

Chapter 11- Sound and video Editing

8 Sound editing software has a number of features that can be used to edit audio files.

(a) State **two** reasons why an audio clip may need to be trimmed.

Reason 1 To remove unwanted parts of the clip

Reason 2 To reduce the length of the track

[2]

(b) State **one** reason why separate audio clips may need to be spliced together.

- To make two recordings flow uninterrupted into one another other
- To Combine the best parts from several recorded performances

[1]

(c) Describe the term equalisation when applied to audio clips.

- To boost or attenuate the level of different frequency in a sound signal
- Can use filters
- By raising (boost the bass)

[3]

Chapter 2 - Hardware and Software

9 Discuss the advantages and disadvantages of using a dialogue interface rather than a gesture-based interface.

Advantages

- User can communicate with the computer using their voice
- It is hands free ; used in telephone systems
- More flexible, can use many different commands
- Do not need direct line of sight
- Useful for people with disabilities

other

Disadvantages

- Potential loss of privacy
- Needs to learn the users speech pattern
- Could have problems if there are background noises
- Not suitable for safety instructions

[8]

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