



Cambridge International AS & A Level

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INFORMATION TECHNOLOGY

9626/12

Paper 1 Theory

February/March 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.

Describe the characteristics that make spreadsheet software suitable for computer modelling.

- Spreadsheet software allows what-if analysis to be carried out

Examples

- Formulae can be created for calculations

- Functions can be performed in formulae

- Charts to present values for comparison

- Conditional formatting can show data that matches (greater than or less than)

- Protect cells from accidental changes

Other: - Sort data into a rank order

- 2 A data dictionary is required when creating a relational database.
- Meta data - attributes for data elements
collection of names, definitions

Identify and describe four components that should be included in a data dictionary.

1 Data type

- Such as alphanumeric, text, boolean etc
- Field length
- Specify the number of character

2 Validation

- testing the data that is entered
- ensure the data entered is reasonable

3 Primary keys / Foreign keys

- Identify unique records
- to link tables

4 Relationships

- Types of relationship between tables (e.g. one to many)

Others - Description of each field

- explanation of the content of each field

[8]

- 3 Keith wishes to ensure that his computer is at its optimum performance.

Identify and describe **three** different types of utility software he should use.

Utility 1 Disk Defragmentation
eg files are able to open more quickly

Utility 2 File Management
- To organise Directories
- Delete unnecessary files

Utility 3 Anti-virus
example
- quarantine any virus it finds
- Prevents viruses from being downloaded

Others Utility 4 - Data Compression tools

[6]

example
- to free up storage space (by compressing files or reducing file size)

4 An airline company uses online processing to allow passengers to book their seats.

(a) Describe how online processing is used in this scenario.

- Computer deal with each input and give immediate response
- Deals with one transaction at a time
- Once the transaction has taken place the database will be updated immediately
- Once seat is booked it is shown as booked
- Once the transaction has taken place the Computer sends a ticket to the user to inform the seat has been booked

[4]

(b) Describe two benefits for passengers of using online processing when booking seats.

Benefit 1 ... Guaranteed that they will be on the flight

Benefit 2 ... Customers can know immediately if they have successfully booked a seat

- Get immediate confirmation

[2]

Others - Flight won't be overbooked
- Seat is held as yours for a period of time.

5 An apartment has a controlled central heating system. This system includes a microprocessor.

Explain how the temperature in the apartment is controlled by the system.

- The required temperature is set by the user
- The required temperature is input using remote control
- Sensor is used to read the current temperature
- The data collected by the sensor is analogue
- The data is converted to digital using Analogue to Digital Converter
- Microprocessor compares the data (temperature) to the required value
- If temperature is the same, nothing happens
- If the data is different than the required value, the microprocessor sends a signal to the actuator
- If lower, the microprocessor through the actuator switches the heater on
- If higher, the actuator switches the heater off

[6]

Take note - The process is constantly repeated

6 Some computer systems have a command line interface (CLI).

Evaluate the use of a CLI.

- A CLI (Command Line Interface) is where the user interacts by typing Commands (text)
- More flexible
- Instructions have to be learnt
- Does not allow multiple windows (multi-tasking)
- CLI Command may be processed more quickly (once typed in)
- CLI Commands are complicated
- Other
 - Requires Specific training
 - CLI uses less memory

[6]

7 The IT manager of RockICT can purchase either off-the-shelf software or custom written software.

(a) Describe **three** advantages for RockICT of purchasing off-the-shelf software.

- The software is more readily available
- Rockict can choose between different manufacturers of software
- The software is more likely to have been fully tested
- Other
- updates to the software can be more frequent

[3]

(b) Describe **three** advantages for RockICT of purchasing custom written software.

- Get direct support from the developer
- Only includes the required features for Rockict
- Rockict has more control of the writing of the software
- Others
- Rockict will own the software and could legally sell it to others
- Rockict can specify exactly what they want

[3]

- 8 A secretary of a company has been asked to transfer all the staff records from the current paper-based system to a computer database. The secretary will use validation and verification to check the data.

Explain why both validation and verification are needed in this scenario.

- These methods on their own do not ensure that the data entered is correct
- Verification is checking that the data entered into the computer has been copied correctly
- Validation is checking that the data entered is reasonable (follows a set of rules)
- Verification helps to stop users from making mistakes when entering data - note: it cannot check that the data was originally correct
- Validation is needed because the original data might be invalid
- Both are needed to make sure that the data is both correctly copied and valid

[6]

9 Encryption can be used to protect data sent in an email.

Evaluate the use of encryption for this purpose.

- An Information (Plain text) is encrypted using an encryption algorithm with an encryption key making uncodeable until decrypted with a decryption key.

Benefits

- Reduces the motivation for interception; because the data is protected
- Allows Confidential Information to be transferred in emails
- Enables business to comply with data protection act (regulations)

Drawbacks

- Hackers can still intercept the emails
- It takes longer to encrypt the data
- It takes longer to decrypt the data
- If the same key is used repeatedly there is a security issue

[7]

MM

- Chapter 11 - Sound and Video editing

10 Sound editing software can be used to alter the sampling rate in audio files.

(a) Explain what is meant by the term sampling rate.

measured (Kilohertz) kHz

- The number of samples

examples

- Usually within 1 second
- within a given period of time

[2]

(b) Explain how the sampling rate can affect the audio files.

- A higher Sampling rate sounds better than a lower rate
- The lower the Sample rate, the smaller the file size because there is less data stored

Others

- It captures sounds at discrete points

[2]

CSV, txt, Jpg Chapter 8

11 Explain what is meant by the term open-source file format.

- It is a format for storing data (digital)
- Used and implemented by anyone
- They can be used at no monetary cost
- Examples; CSV, txt, Jpg

[3]

- 12 A digital divide exists between the more technologically aware and the less technologically aware nations.

Analyse this type of digital divide.

- The gap is caused by differing levels of knowledge about what technology is available
- A Nation who is aware of what can be achieved will use the technology
- Increased digital awareness leads to increase, more investment in IT
- This divide may be reduced by education
- This divide may exist within any age group
- A Nation who is not aware of what can be achieved will not use the technology

[6]

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