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MARKSCHEME

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INFORMATION TECHNOLOGY IN A GLOBAL SOCIETY

Higher Level and Standard Level

Paper 1

Examiners should be aware that in some cases, candidates may take a different approach, which if appropriate should be rewarded. If in doubt check with your Team Leader.

In the case of an "identify" question read all answers and mark positively up to the maximum marks. Disregard incorrect answers. In the case of a "describe" question, which asks for a certain number of facts *e.g.* "describe two kinds", mark the **first two** correct answers. This could include two descriptions, one description and one identification, or two identifications.

1.   (a)   **Define the term** *multitasking*.   *[2 marks]*

              Answers may include:
              • more than one program/process
              • is (apparently) being executed at the same time
              • control shifts between processes very rapidly
              • example of multitasking described.

              Award [1 mark] for any of the above points up to a maximum of [2 marks].

       (b)   **Identify** *four* **reasons why Windows has required increasing amounts of system resources as it has been developed.**   *[4 marks]*

              Answers may include:
              • more features added
              • the software has become bigger
              • more automation
              • higher resolutions of screen supported
              • hardware has become cheaper
              • older versions were constrained by the hardware that was then current
              • development tools do not require new code to be efficient
              • Internet developments require more support.

              Award [1 mark] for any of the above points up to a maximum of [4 marks].

(c)   **A company is considering changing the operating system that it uses on its PCs to Linux, which is free open source software. Explain reasons why a company might choose to pay for commercial software rather than obtain it free.**   *[4 marks]*

Answers may include:
- free software may lack compatibility with other users/business partners
- free applications are different from commercial applications
- free applications may not be well tested
- free applications may have less features
- retraining may be required
- there may be resistance from users
- commercial – availability of support
- commercial – might carry a guarantee.

[1 mark]
A limited response that indicates very little understanding of the topic.

[2–3 marks]
A reasonable description, although the answer may lack appropriate reasoning at the lower end of the band.

[4 marks]
A clear, detailed explanation of the issue with reasons.

2. **(a)** **With reference to a computer system, define the term *Trojan horse*.**   *[2 marks]*

Answers may include:
• malware
• software that appears to be something useful and hides its malicious purpose (*i.e.* installing software without user's knowledge or recording actions)
• may be used to help a hacker access a system remotely.

Award [1 mark] for any of the above points up to a maximum of [2 marks].

(b) **Describe *two* ways in which keylogging software could make its logged data available to a remotely located observer.**   *[4 marks]*

Answers may include:
• data is uploaded – to a web site or an FTP account
• data is periodically e-mailed – to a pre-defined e-mail address
• data is wirelessly transmitted – by means of an attached hardware system
• any reference to P2P methods or example of file sharing software (*if in doubt, look it up on Wikipedia*)
• it allows the observer to log into the local machine – via the Internet or Ethernet, and access the logs stored on the target machine.

Do not allow just "Internet" or "network".

Award [1 mark] for two techniques that are identified up to a maximum of [2 marks]. Award an additional [1 mark] for any two descriptions up to a maximum of an additional [2 marks]. Award a maximum of [4 marks] for the answer.

(c) **Explain *two* reasons why a network administrator might install a keylogger.**   *[4 marks]*

Answers may include:
• to monitor the use of a machine when the user is not present
• to monitor a user's activity
• to recover data in the event of a failure
• to monitor software use
• to monitor system performance
• to monitor system usability
• to assist in providing technical help.

For the first two valid reasons award [1 mark] for each reason identified and [1 mark] for it explained up to a maximum of [2 marks].

3. **(a)** **(i)** **A query is applied to the data shown in the table above using the following condition:**

date_of_arrival>24.05.09 *AND* **number_nights=8**

Identify the number of records generated as a result of this query. *[1 mark]*

1

(ii) **A query is applied to the data shown in the table above using the following condition:**

date_of_arrival>24.05.09 *OR* **number_nights=8**

Identify the number of records generated as a result of this query. *[1 mark]*

3

(b) **Describe** *two* **ways in which each record in the data table on the previous page could be uniquely identified.** *[4 marks]*

Answers may include:
- combined key
- date_of_arrival and room_number.

Award [1 mark] for each of the above points up to a maximum of [2 marks].

- create a new field
- unique reference number / ID / other suitably named unique field.

Do not allow telephone numbers or e-mail addresses.

Award [1 mark] for each of the above points up to a maximum of [2 marks].

(c) **Many booking agencies can access the hotel bookings database simultaneously. Explain how the integrity _and_ the security of the data can be maintained.** *[4 marks]*

Answers may include:
Integrity
- validation
- examples of relevant validation
- any correct comment about verification
- limited options available on data entry form
- record locking
- make record read-only if open to another agent.

Security
- limited access to parts of the database needed
- login ID / password protected
- access limited to certain IP addresses
- encryption – use of keys.

[1 mark]
A limited response that indicates very little understanding of the topic.

[2–3 marks]
A reasonable description, although the answer may lack appropriate reasoning at the lower end of the band. The candidate may correctly refer to either integrity or security.

[4 marks]
A clear, detailed explanation of the issue with reasons. The candidate must clearly demonstrate an understanding of the difference between integrity and security.

4.   **(a)**   **Define the term** *computer model*.   *[2 marks]*

Answers may include:
- a mathematical/digital representation
- of the functioning of a system / real-life scenario
- in the form of a computer program
- used as the basis of a computer simulation.

*Do **not** allow answers that imply it is the same thing as a computer simulation.*

Award [1 mark] for any of the above points up to a maximum of [2 marks].

(b)   **A student wishes to create an animated movie that starts with Image 1 and ends with Image 2.**

Describe the processes by which this computer model can be used to generate a sequence of images to create an animated movie.   *[4 marks]*

Answers may include:
- input value for snow density
- input value for total time (length of animated movie)
- input value for the time intervals
- input value for wind speed/direction
- capture images at set time intervals
- run model with image
- until enough snow density is reached.

Award [1 mark] for any of the above points up to a maximum of [4 marks].

(c)   **Explain** *two* **factors that would contribute to the accuracy of this computer model.**   *[4 marks]*

Answers may include:
- enough factors / sufficient data incorporated
- the factors used are well understood
- the factors used are correctly represented mathematically
- the factors used represent reality
- the data input is as accurate as possible.

For the first two valid factors award [1 mark] for each factor identified and [1 mark] for it explained up to a maximum of [2 marks].