**Grade 12 IT**

**Theory Test**

**Mark Total: [55]**

**Scenario:**

4Data is a new computer business that opened in your area. Tom, the manager advertises for assistance with some of the computer related questions that he has about running a computer business. You went for the post and assisted him by answering the following questions:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Question 1** | | | | | | |
| 1.1 | | How many CPUs does a quad-core chip have? | | | | (1) |
| 1.2 | | Tom has been advised to replace the RAM of the computer in order to enhance its performance. | | | |  |
|  | | (a) | | How will you ensure that the new RAM is compatible with the current motherboard? | | (1) |
| (b) | | Some of the employees are of the opinion that, if there was enough virtual memory, there is no need to upgrade the RAM. | |  |
|  | | 1. Explain what *virtual memory* is. | | (2) |
|  | | 1. Explain why virtual memory will not be the solution to better performance. | | (1) |
| (c) | | The statement “Upgrading RAM means more cache memory is available” was made. Give THREE reasons why this statement is NOT true. | | (3) |
| 1.3 | | The suggested processor uses the multiprocessing technique to process tasks. Define the term *multiprocessing.* | | | | (2) |
| 1.4 | | List FOUR steps the CPU repeats for every instruction it has to execute, which is also known as the machine cycle. | | | | (4) |
| **Question 2** | | | | | | |
| 2.1 | | 4Data uses online banking to receive and make payments. | | | |  |
|  | | 2.1.1 | | A lock symbol appears in the browser interface when using the online banking website to indicate security. | |  |
|  | |  | | 1. How else could you tell whether the website is secure? | | (1) |
|  | |  | | 1. Why is a website not guaranteed to be secure even if there is a lock symbol? | | (1) |
|  | | 2.1.2 | | E-Commerce websites used public key encryption to ensure that transactions are secure. | |  |
|  | |  | | 1. What is e-commerce? | | (1) |
|  | |  | | 1. Briefly explain what an encryption algorithm does. | | (1) |
|  | | 2.1.3 | | Phishing is always a risk when users are online. | |  |
|  | |  | | 1. Explain what phishing is. | | (2) |
|  | |  | | 1. How does pharming differ from phishing? | | (1) |
|  | | 2.1.4 | | Online users often receive hoax e-mails. Give TWO pieces of advice on how to respond to a hoax. | | (2) |
| 2.2 | | Why is it advisable to have a firewall installed at 4Data office? | | | | (1) |
| 2.3 | | The accounted of 4Data requested that SSL should be implemented as an encryption protocol. | | | |  |
|  | | 2.3.1 | | How will 4Data’s website address (<http://www.4Data.co.za>) change once SSL is implemented? | | (1) |
|  | | 2.3.2 | | What is required to be able to decrypt an SSL-encrypted e-mail? | | (2) |
| 2.4 | | State ONE disadvantage of having e-communication facilities at 4Data company from the customers’ point of view. | | | | (1) |
| 2.5 | | Give TWO practical and interesting examples of how podcasting can be used at 4Data. | | | | (2) |
| **Question 3** | | | | | | |
| 3.1 | | While going through the log of sent items on the e-mail server, Tom, the manager saw an e-mail that the secretary had sent to her husband. Her husband is an estate agent selling holiday flats. A list of all the e-mail addresses of the company’s clients from the company’s database was attached to the e-mail. | | | |  |
|  | | 3.1.1 | | These e-mail addresses can be used to send spam. Explain what *spam* is. | | (2) |
|  | | 3.1.2 | | Name TWO ethical issues regarding the e-mail that was sent by the secretary (excluding the possibility of spamming people). | | (2) |
|  | | 3.1.3 | | The manager incorrectly refers to the sending of e-mail as identity theft. Explain what *identity theft* is. | | (2) |
| **Question 4** | | | | | | |
| 4.1 | | Koos and Willie are the programmers who created the software for 4Data usedobject-oriented programming (OOP) principles. The following class diagram has been designed to represent a client object. Study the class diagram below and answer the questions that follow.   |  |  | | --- | --- | | CLIENT |  | | - ClientID | Private attributes | | - ClientFirstName | | - ClientSurname | | + Constructor () | Public methods | | + Constructor (ClientID) | | + Constructor (ClientID, ClientFirstName,   ClientSurname) | | + getFirstName () : String | | + getSurname () : String | | + setFirstName (ClientFirstName) | | + setSurname (ClientSurname) | | + toString () : String | | | | |  |
|  | | 4.1.1 | | Use examples from the class diagram above to explain the concept of *overloading.* | | (2) |
|  | | 4.1.2 | | Classes can contain accessor and mutator methods.  (a) Briefly explain why a class requires an accessor method. | | (2) |
|  | |  | | (b) Give ONE example of an accessor method from the given class diagram. | | (1) |
|  | | 4.1.3 | | What is the purpose of the *toString()* method? | | (1) |
| 4.2 | The two programmers used a Database program to control the orders of 4Data. They have added another table **tblHardwareOrders** that is used to store data on the orders placed for hardware. The table has not been normalised.   |  |  |  |  | | --- | --- | --- | --- | | **tblHardwareOrders** | | | | | **Key** | **Field Name** | **Data Type** | **Description** | |  | OrderNo | Text | Number of the order | |  | OrderDate | Date/Time | Date the order was placed | |  | Hardware1 | Text | Name of the hardware device | |  | Description1 | Text | Description of the hardware device | |  | Quantity1 | Number | Quantity of the hardware that were ordered | |  | CostPrice1 | Currency | Cost price of the hardware | |  | Hardware2 | Text | Name of the hardware device | |  | Description2 | Text | Description of the hardware device | |  | Quantity2 | Number | Quantity of the hardware that were ordered | |  | CostPrice2 | Currency | Cost price of the hardware | |  | TotalAmount | Currency | Total monetary value of this order | | | | |  | |
|  | 4.2.1 | | *Insert anomalies* is one of the problems that can occur when the table has not been normalised.  The following orders are placed separately but on the same day. In each case, give a reason why the insert anomaly will occur when the data has to be captured in the **tblHardwareOrders** table. | |  | |
|  |  | | (a) In the morning the Tom orders three different kinds of hardware using order number AB230. | | (2) | |
|  |  | | (b) In the afternoon two hardware devices need to be ordered using order number AB245. | | (2) | |
|  | 4.2.2 | | The following is a possible solution for normalising the **tblHardwareOrders** table into 1NF. The **tblOrders** table makes use of a combined primary key to refer to records in the table.   |  |  | | --- | --- | | **tblHardware** | | | **Key** | **FieldName** | |  | HardwareID | |  | Description | |  | CostPrice |  |  |  | | --- | --- | | **tblOrders** | | | Key | FieldName | |  | OrderNo | |  | HardwareID | |  | OrderDate | |  | Quantity | |  | TotalAmount | | |  | |
|  |  | | (a) What is a *combined primary key?* | | (2) | |
|  |  | | (b) Give TWO reasons why the use of a combined primary key is required in this table. | | (2) | |
|  |  | | (c) One of the aims of second normal form is to prevent partial dependencies. Define the term *partial dependency.* | | (1) | |
|  | 4.2.3 | | The following is an attempt to normalise the given **tblHardwareOrders** table into 2NF. | |  | |
| |  |  | | --- | --- | | **tblOrders** | | | Key | FieldName | |  | OrderNo | |  | OrderDate |  |  |  | | --- | --- | | **tblHardware** | | | **Key** | **FieldName** | |  | HardwareID | |  | Description | |  | CostPrice |  |  |  | | --- | --- | | **tblOrderHardware** | | | Key | FieldName | |  | OrderNo | |  | HardwareID | |  | Quantity | | | | |
|  |  | | (a) Identify the type of relationship between the **tblOrders** table and the **tblOrderHardware** table in the diagram. | | (1) | |
|  |  | | (b) Give ONE example of a field that can act as the foreign key in the **tblOrderHardware** table. | | (1) | |
|  |  | | (c) The **TotalAmount** field does not appear in any of the 2NF tables. Will the user still be able to determine the total price of an order? Give a brief explanation to substantiate your answer. | | (2) | |
|  |  | | **Total** | | **[55]** | |