**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]** |