higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

COMPUTER PROGRAMMING

(First paper)
NQF LEVEL 4

(10041024)

27 November 2024 (X-paper)
09:00–11:00

This question paper consists of 9 pages.

531Q1N2427

Copyright reserved

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
COMPUTER PROGRAMMING
NQF LEVEL 4
(First paper)
TIME: 2 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Read all the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Start each section on a new page.
5. Use only a black or blue pen.
6. Write neatly and legibly.

Copyright reserved

SECTION A

QUESTION 1

Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1–1.5) in the ANSWER BOOK.

1.1 In OOP, an instance of a class is called a/an …

A identifier.
B object.
C method.
D constructor.

1.2 Primary keys in a RDBMS are essential for uniquely identifying records in a table. They are often used in combination with … to establish relationships between tables.

A string keys
B foreign keys
C single keys
D remote keys.

1.3 The SQL UPDATE statement requires the … keyword in order to specify which columns to update.

A INTO
B ALTER
C DROP
D SET

1.4 To create a *numbered list* in HTML, you have to use a combination of the … elements.

A <ol> and
B <nl> and
C <li> and <p>
D <a> and

1.5 Which ONE of the following combinations properly identifies the elements in the CSS script `p {color: red;}`?

A `p` is the property; `color` is the selector, `red` is the value
B `p` is the value; `color` is the selector, `red` is the property
C `p` is the selector; `color` is the property, `red` is the value
D `p` is the selector; `color` is the value, `red` is the property

(5 × 1) **[5]**

Copyright reserved

QUESTION 2

Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (2.1–2.10) in the ANSWER BOOK.

2.1 The VB.NET statement, `Dim myArray As Integers()` , declares a single dimensional array of integers.

2.2 An INNER JOIN in SQL is a type of join that retrieves records from two or more tables based on a related column between them. It only returns rows where there is a MATCH in all the joined tables.

2.3 A UML class diagram typically consists of TWO main parts: properties and methods.

2.4 One of the main differences between `arrays` and `lists` is that `lists` have a fixed size whereas `arrays` are considered to be dynamic.

2.5 Technical feasibility refers to the ability to develop a solution or system that meets the required specifications, constraints, and performance criteria using existing or readily available technology.

2.6 Database normalisation is the process of organising the fields and tables of a relational database to minimise data redundancy and dependency.

2.7 An IP address can be used to provide the location of a device on a network, enabling data to be routed to the correct device

2.8 One of the fundamental principles of website design, is to decide on the font style of the text first, and later consider the views of the target audience.

2.9 WYSIWYG editors are able to produce a preview of the output of the source code.

2.10 The <music> HTML tag will allow you to embed sound files such as .MP3, OGG, etc in a webpage.

(10 × 1) **[10]**

QUESTION 3

Write each of the following acronyms or abbreviations in full next to the question number (3.1–3.5) in the ANSWER BOOK.

3.1 FTP

3.2 3NF

3.3 TCP

3.4 SSL

3.5 DOM

(5 × 1) **[5]**

Copyright reserved

QUESTION 4

Choose the correct term from those in brackets and write it next to the question number (4.1–4.5) in the ANSWER BOOK.

4.1 In VB.Net, a calculation that involves division by zero, will produce a (runtime | syntax | logical) error.

4.2 The tag combination of (`<!-- -->` | `/* */` | `//-- --//`) are used to write comment statements in HTML.

4.3 The VB.NET (`String.isInside()` | `String.Contains()` | `String.isTrue()`) method is used to check if a substring is present within a given string.

4.4 In JavaScript we use the (= | == | ===) operator to check if the values and data types of two operands are equal.

4.5 In the CSS statement `padding: 10px 20px 8px 30px;` the padding-right value will be (20px | 30px | 8px).

(5 × 1) **[5]**

TOTAL SECTION A: 25

SECTION B

QUESTION 5

5.1 In Object-Oriented Programming (OOP), the terms **base class** and **subclass** describe the relationship between classes in a particular hierarchy. What are the main differences between these two class types? (4)

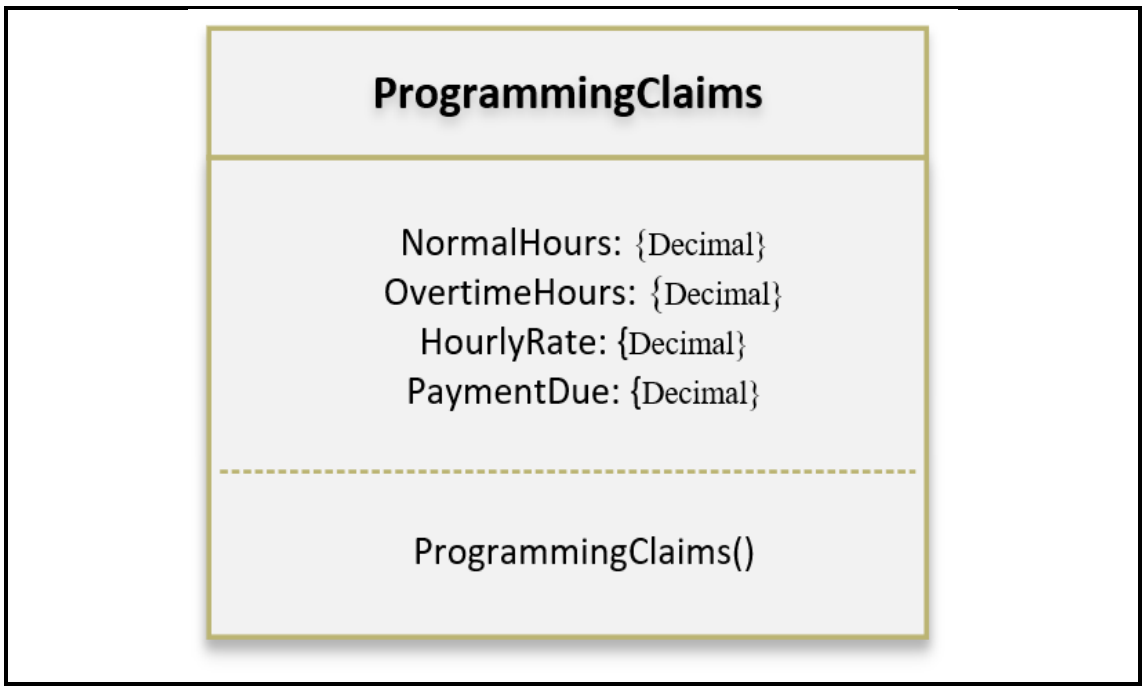
5.2 Give a brief explanation for each of the following OOP concepts:

5.2.1 Cohesion (2)

5.2.2 Encapsulation (2)

5.2.3 Polymorphism (2)

5.3 Study the UML Class Diagram below and answer the questions that follow:



5.3.1 Provide the VB.Net code that will create a constructor which must accept THREE parameters and initialise the fields *NormalHours*, *OvertimeHours* and *HourlyRate* with the values passed as arguments. (7)

5.3.2 Provide the VB.Net code to create a read-only property for *PaymentDue* to calculate and return the value as (*NormalHours* + *OvertimeHours*) * *HourlyRate*. (4)

Copyright reserved

5.4 The VB.Net statement, `Dim personList As New List(Of Person)` will create a new OBJECT LIST of type "*Person*" where the object "*Person*" is assumed to be defined with the properties "*Name*" and "*Age*".

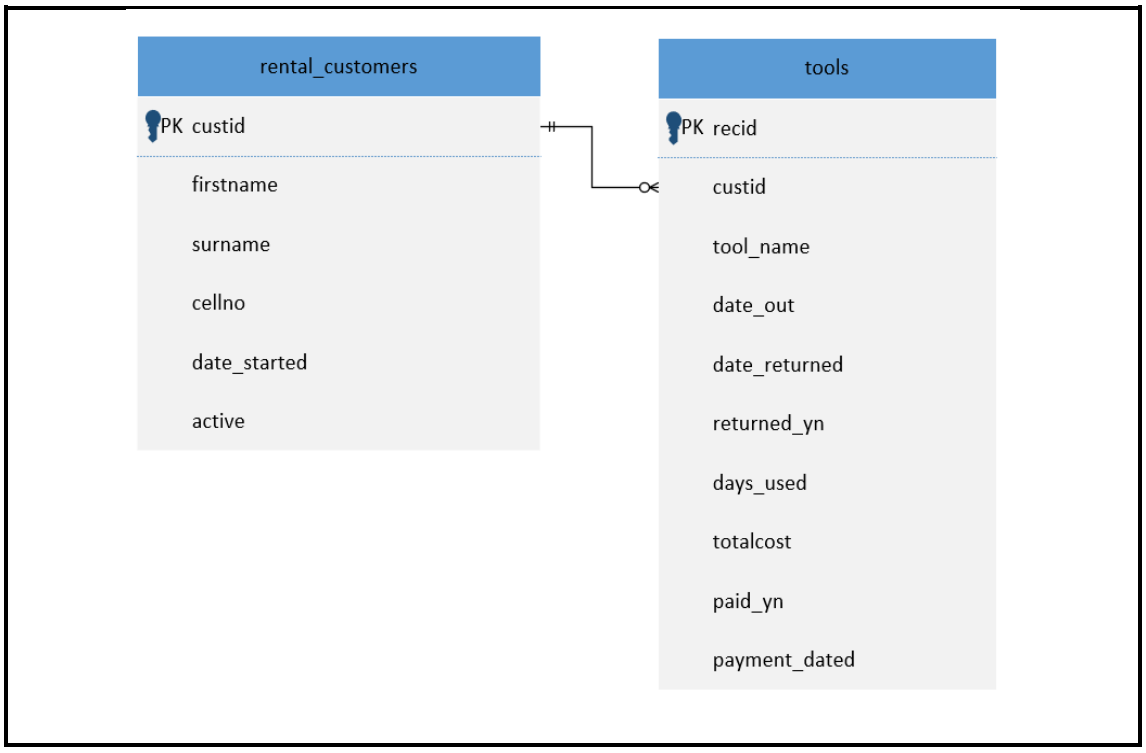
5.4.1 Define what is meant by an OBJECT LIST? (2)

5.4.2 Provide the line of code that will add the person "James Longwind", age 28, to the list. (3)

[26]

QUESTION 6

6.1 The Entity Relationship Diagram below represents the database table structures and relationships of a small tool-hire business. Study the diagram and answer the questions that follow:



6.1.1 Identify the database relationship that exists between the two tables. (1)

6.1.2 Give a brief definition of the relationship identified in QUESTION 6.1.1. (2)

6.1.3 Identify the primary and foreign keys in the above database relationship. (2)

6.1.4 Database access objectives focus on ensuring that a database performs efficiently and effectively. List any FOUR of these objectives. (4)

Copyright reserved

6.1.5 Compose a SQL statement that will list all the customers who have not yet returned the tools they hired. The query result must be in alphabetical order according to the customer's surname and must include the `custid`, `firstname`, `surname`, `tool_name`, `date_out` and the `returned_yn` data entities. (11)

[20]

QUESTION 7

7.1 All properly structured HTML documents include an opening and closing `<head>` element. What is the purpose of this element? (1)

7.2 Describe the difference between `block` and `in-line` HTML elements. (2)

7.3 Give the HTML element you will use to achieve the following:

7.3.1 Embed or reference JavaScript code

7.3.2 Include an external reference such as a stylesheet

7.3.3 Define a section of navigation links

7.3.4 Create a thematic grouping of content

(4 × 1) (4)

7.4 Explain what is meant by the BOX MODEL in CSS. (2)

7.5 Give the line of CSS code you will use to centre a box element horizontally on a page, assuming the element has been given a set width. (1)

7.6 What is the purpose of `z-index` in CSS? (1)

7.7 What is JavaScript used for in web development? (2)

7.8 Identify the errors in the JavaScript function below. Write down the line number and indicate what the error is.

```
1.  -- calculate sum of two numbers & return answer
2.  function calcSum(num1 num2) {
3.      message = 'The sum of the two numbers =";
4.      let answer = num1 + num2;
5.      alert(message+" "+answer;
6.      return answer;
7.   }
```

(3)

[16]

QUESTION 8

8.1 Briefly describe TWO factors that affect the reliability of information on the Web. (4)

8.2 Identify any TWO processes that form part of Web Development & Design. (2)

8.3 List THREE ways in which documentation enhances the understanding of programming code. (3)

8.4 Identify TWO advantages and TWO disadvantages of WYSIWYG editors and other website design tools (4)
[13]

TOTAL SECTION B: 75
GRAND TOTAL: 100

Copyright reserved