higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

COMPUTER PROGRAMMING

(First paper)

NQF LEVEL 4

(10041024)

25 November 2020 (X-paper)
09:00–11:00

This question paper consists of 9 pages.

103Q1N2025

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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.

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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 (1.1–1.10) in the ANSWER BOOK.

1.1 In OOP, a class can have a visibility that may be public or …

A local.
B exceptional.
C private.
D coupled.

1.2 Which of the following is simply a combination of process and data in a single entity?

A Encapsulation
B Polymorphism
C Inheritance
D Modular

1.3 In database design, the process of removing duplication and reducing redundant chunks of data is called ...

A Tables
B Structure
C Procedure
D Normalisation

1.4 In relational database terminology a … refers to a combination of at least one or more fields.

A record
B table
C database
D relationship

1.5 … is a protocol used to send requests to the web server.

A TCP/IP
B HTTP
C SMTP
D POP

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1.6 … is a method of protecting a software developer's internet content from being stolen by others.

A Ownership
B Infringement
C Royalties
D Copyright

1.7 The type of software application that makes it possible for internet users to access websites is called a ...

A blog
B browser
C server
D www

1.8 The HTML tag used to define a cell is …

A <td>
B <tr>
C <table>
D

1.9 The aim of the … is to plan the navigation of a site and to present a paper visualisation of the entire website.

A design
B application
C project
D storyboard

1.10 Determine the value of *MyVariable* after the execution of the following JavaScript code:

```
MyVariable = 4;
MyVariable = ++MyVariable + 5 * 6;
```

A 54
B 34
C 35
D 4

(10 × 1) **[10]**

QUESTION 2

Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (2.1–2.5) in the ANSWER BOOK.

2.1 Concatenating text in JavaScript involves adding strings together using the plus symbol (+).

2.2 A constructor is a method which cannot be invoked explicitly but it is instead executed only when an object is instantiated.

2.3 Interactive websites are used for displaying information such as educational or recreational information.

2.4 SQL injection is a type of server side security vulnerability in which an attacker may attempt to access database content.

2.5 Both foreign and primary keys must be of the same data type.

(5 × 1) **[5]**

QUESTION 3

Choose an item from COLUMN B that matches a description in COLUMN A. Write only the letter (A–I) next to the question number (3.1–3.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
3.1	The accuracy and consistency of data within a relationship	A	inheritance
3.2	Compares the implemented system against the design document and requirement specifications and produces an acceptance report	B	strong cohesion
3.3	Occurs when an instance of one class within a system is dependent on an instance of a different class	C	normalisation
3.4	Takes place when objects of a class inherit methods and data members of a superclass	D	testing
3.5	HTML tag used to create a heading with the largest font size	E	H3
		F	H1
		G	referential integrity
		H	strong coupling
		I	documentation

(5 × 1) **[5]**

QUESTION 4

Give ONE word/term for each of the following descriptions. Write only the answer next to the question number (4.1–4.5) in the ANSWER BOOK.

4.1 A privately maintained computer network that uses internet protocols and is accessible only to the organisation's staff members.

4.2 Payments to the owner of intellectual property for the use of that property.

4.3 A website or database developed collaboratively by a community of users, allowing any user to add and edit content.

4.4 Content that uses a combination of different content forms such as text, audio, images, animations, video and interactive content.

4.5 A high-level interpreted programming language that conforms to ECMA standards

(5 × 1) **[5]**

TOTAL SECTION A: 25

SECTION B

QUESTION 5

5.1 Study the OOP code below and answer the question.

```
1   Public Class clsStudent
2       Private StudentName As String
3       Private Tests(0 - 1) As Integer 'Two test to be written
4       Private CourseGrade As String
        4 references
5       Public Property _Scores(ByVal number As Integer) As Int
        4 references
13      Public Property _CourseGrade As String ...
        2 references
21      Public Overridable Sub GradeStudent()
22      End Sub
23  End Class
```

```
1   Public Class clsCareerStudent
2       Inherits clsStudent
        2 references
3       Public Overrides Sub GradeStudent()
4           Dim Score As Integer = (_Scores(0) + _Scores(1)) / 2
5           If Score >= 90 Then ...
10      End Sub
11  End Class
```

```
1   Public Class clsInstrouctorStudent
2       Inherits clsStudent
        2 references
3       Public Overrides Sub GradeStudent()
4           Dim Score As Integer = (_Scores(0) + _Scores(1)) / 2
5           If Score >= 90 Then ...
10      End Sub
11  End Class
```

Create a UML class diagram to represent the scenario depicted in the source code above. Show the class names, data members, methods and inheritance hierarchy. (10)

5.2 Which is the best image file type to use for the display of several small icons in a web-based application? (1)

5.3 Differentiate between the following:

5.3.1 Website

5.3.2 Web-based application

(2 × 3) (6)

5.4 Tabulate TWO advantages and TWO disadvantages of a web-based application. (4)

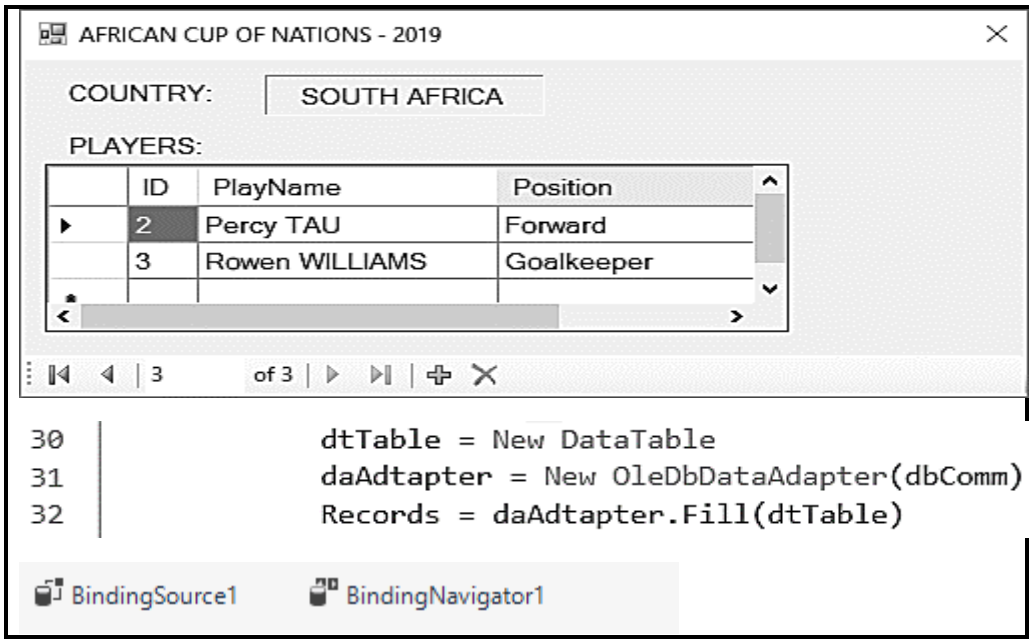
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5.5 Name TWO common uses of client-side scripting. (2)

5.6 State TWO disadvantages of using client-side scripting. (2)
[25]

QUESTION 6

6.1 Study the diagram below and answer the questions:



6.1.1 List the all the information you will need to display the output shown above. (5)

6.1.2 State the purpose of the code in line number 32 in the diagram (2)

6.1.3 Construct the code to set up the data binding of the label called lblCountry to the BindingSource1. (3)

6.1.4 Construct a line of code that will activate the BindingNavigator1. (1)

6.2 Briefly explain the following security control principles:

6.2.1 Change-response system

6.2.2 OTP

6.2.3 HTTPS

(3 × 2) (6)

6.3 List the main purpose of each of the following OOP terminologies:

6.3.1 Class hierarchy diagram

6.3.2 Constructors

6.3.3 Abstract class

(3 × 2) (6)

6.4 State TWO benefits of using an object-oriented programming methodology. (2)
[25]

QUESTION 7

Study the web page below and then answer the questions.



7.1 Create an HTML tag to insert a graphic into the web page. Use vlc.jpg as the name of the image file. (2)

7.2 Modify the image element in QUESTION 7.1 so that the image floats to the left with a height of 50 pixels and a right margin of 5px. (3)

7.3 Create an anchor element that links to nowhere for the underlined "read more" text on the web page above. (2)

7.4 List the benefits of each of the following user interface technologies:

7.4.1 Web forms

7.4.2 Server pages

7.4.3 Applets

(3 × 2) (6)

7.5 State TWO factors that can affect the loading time of a web page. (2)

7.6 List the main attributes of the following editors:

7.6.1 Text editor (3)

7.6.2 HTML editor (2)

7.6.3 WYSIWYG editor (3)

7.7 Name TWO characteristics of self-documenting program code. (2)
[25]

TOTAL SECTION B: 75
GRAND TOTAL: 100

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