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 2019 (X-Paper)
09:00–11:00

This question paper consists of 9 pages.

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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–E) next to the question number (1.1–1.10) in the ANSWER BOOK.

1.1 … are routines encapsulated in objects and operate on the data described in those objects.

A Attributes
B Methods
C Functions
D SubProcedures
E DataMasks

1.2 Which ONE of the following is a form of software reusability in which new classes are created from existing classes by absorbing their attributes and behaviours:

A Polymorphism
B Encapsulation
C Instantiation
D Inheritance
E Abstraction

1.3 Which ONE of the following is used with OLE drivers to access data from a database table:

A Java
B SQL
C PHP
D Python
E Ruby

1.4 … is the process of ensuring that the program logic does what it is required to do according to user specifications.

A Coding
B Formatting
C Testing
D Encrypting
E Compiling

1.5 Computer viruses that pretend to be legitimate software are called …

A Trojan horses
B Spyware
C Firewalls
D Hoaxes
E Malware

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1.6 Software solutions legally belong to the …

A Software developer.
B Software user.
C Copyright holder.
D System Analyst.
E Software Distributor.

1.7 The software application, which allows the end-user to access information on the Internet by translating HTML and related scripts into readable content, is called a …

A web server.
B web browser.
C web editor.
D web application.
E web search engine.

1.8 The computer, virtual or otherwise, which hosts a website, is called a …

A database server.
B web server.
C domain name server.
D file server.
E Internet access point server.

1.9 Which ONE of the following is NOT required for creating a multimedia web-based application:

A Photo-editing tool
B Syntax-checking script editor
C Audio-editing tool
D PDF reader
E Content database

1.10 In the HTML <script> tag, which ONE of the following attributes will be used to identify the scripting language to the browser:

A Type
B SRC
C Id
D Name
E Defer

(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 (2.1–2.10) in the ANSWER BOOK.

2.1 An object called *tscStudent* can be instantiated as *Dim tscStudent As String.*

2.2 The statement *Sub New(ByVal value As String)* is an example of a parameterised constructor.

2.3 'Are the client's requirements feasible?' is one of a number of useful questions a system analyst may ask before committing programming resources to a project.

2.4 An instance**,** in object-oriented programming, can be defined as a specific realisation of any object.

2.5 A session-oriented protocol does not require the server to carry out any authentication.

2.6 'Cookies' are the most popular method used to obtain information about HTTP interactions between a browser and a server.

2.7 Client-side scripting is required for authenticating users on a web server.

2.8 The HTML <article> tag is used to create links to other documents or 'named' sections within the same document.

2.9 A storyboard is a series of sketches, which assist clients and developers to visualise a website before building it.

2.10 Hardware and software specification information are not required when planning a web-based application.

(10 × 1) **[10]**

QUESTION 3

Give ONE term for each of the following descriptions. Write only the term next to the question number (3.1–3.5) in the ANSWER BOOK.

3.1 The process of minimising redundancy from a relation or set of relations in a database.

3.2 The ability of an object-oriented programming language to process objects differently depending on their data type or class.

3.3 The system or process of managing different versions of files or applications.

3.4 An element in an HTML document, which links to either another portion or section in the document, or to another document altogether.

3.5 An error, flaw, failure or fault in a computer program or system that causes it to produce an incorrect or unexpected result, or to behave in unintended ways.

(5 × 1) **[5]**

TOTAL SECTION A: 25

SECTION B

QUESTION 4

4.1 List THREE reasons why object-oriented programming is considered a useful and efficient programming methodology. (3)

4.2 Identify THREE focus areas when testing or debugging client-side script code. (3)

4.3 Study the tax invoice shown in FIGURE 1 and answer the questions.

Kate NOKWE Contact No: 0614568979	Vehicle Reg. Number:	DW 34 DF GP
	Vehicle Make & Model:	Renault Duster
	Vehicle Colour:	Metalic Blue

Description	Extras	Car Wash Cost	Total Cost	Excl. VAT
Wash and Go	R0,00	R70,00	R70,00	R60,87

FIGURE 1

4.3.1 Identify THREE objects from the tax invoice. (3)

4.3.2 Give TWO attributes and ONE method for each object identified in QUESTION 4.3.1. (9)

4.4 Give the appropriate development tools applicable to each of the following situations:

4.4.1 Coding a web application directly in HTML

4.4.2 Application that needs server-side scripting for database access

4.4.3 Using self-created graphic images

4.4.4 Application that needs client-side scripting for data validation

(4 × 2) (8)

4.5 Read the information below and answer the question.

In a property-rental system, there are two types of properties, namely mountain view and beach view. Street address and city are common attributes. Skiing availability is an attribute of mountain property and beach property has an attribute named *number-of-blocks-to-beach*.

Use object-oriented notation to draw a class diagram that will depict the above scenario. (8)

[34]

QUESTION 5

5.1 A database is made up of different elements, such as tables, keys and relationships.

5.1.1 Explain the term *key*. (2)

5.1.2 Identify TWO types of keys. (2)

5.2 List THREE ways in which web transactions, such as product purchases, user queries, etc., can be facilitated in HTML. (3)

5.3 Read the information below and use it to answer the question.

Telkom LTE double-data package offers anytime and night-surfer (12 am–7 am) data: 10 GB Anytime data, 10 GB Night-surfer data @ R269 per month 20 GB Anytime data, 20 GB Night-surfer data @ R459 per month 60 GB Anytime data, 60 GB Night-surfer data @ R559 per month 100 GB Anytime data, 100 GB Night-surfer data @ R759 per month 200 GB Anytime data, 200 GB Night-surfer data @ R1 059 per month

[Adapted from: *http://www.ltedeals.co.za*]

Determine the length of time in seconds needed to download 20 GB worth of data with an Internet connection speed of 10 mbps.

HINT: Convert to appropriate units before calculating download time.

Conversions:

1 mbps = 1 000 kbps
1 GB = 1 000 000 KB
1 GB = 1000 Mb
1 Byte = 8 bits
1 KB = 8 KB

(4)

5.4 Provide the JavaScript code for a function that will check if a user completed a textbox field. If NOT, it should display an appropriate message informing the user that the requested information is required. (8)

[19]

QUESTION 6

6.1 Access control is a security technique that regulates who or what can view or use resources in a computing environment. Explain how each of the following security controls work in terms of restricting access to services and/or data:

6.1.1 Challenge response

6.1.2 One-time pin (OTP)

6.1.3 Encryption

(3 × 2) (6)

6.2 Explain what is meant by each of the following database relationships and give an example to support your explanation.

6.2.1 One-to-one relationship (2)

6.2.2 One-to-many relationship (2)

6.3 Discuss how each of the following can impact Application Design.

6.3.1 Low bandwidth and high latency (2)

6.3.2 High bandwidth and low latency (2)

6.4 Study the web form in FIGURE 2 and answer the question.

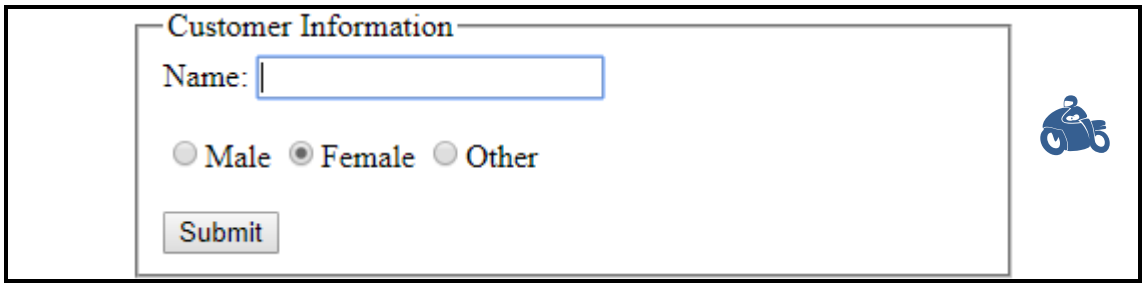

FIGURE 2

Provide the necessary HTML code that will reproduce the simple web form, as displayed in FIGURE 2. (8)

[22]

TOTAL SECTION B: 75
GRAND TOTAL: 100

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