higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

COMPUTER PROGRAMMING

(First Paper)

NQF LEVEL 4

(10041024)

15 March 2018 (Y-Paper)
13:00–15:00

This question paper consists of 10 pages.

NCV

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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. Write neatly and legibly.

NC(V)

SECTION A

QUESTION 1

1.1 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 (1.1.1–1.1.10) in the ANSWER BOOK.

1.1.1 A standard protocol used to deliver e-mails from an e-mail client to an e-mail server:

A HTTP
B IMAP
C SMTP
D POP3

1.1.2 In order to normalise database tables in a database to third normal form (3NF) you must remove all ...

A repeating groups
B transitive dependencies
C multi-valued attributes
D partial dependencies

1.1.3 …, also referred to as data hiding, is a way of protecting the data of an object.

A Inheritance
B Encapsulation
C Polymorphism
D Abstraction

1.1.4 An example of a server-side scripting language:

A PHP
B JavaScript
C VBScript
D C++

1.1.5 The … attribute tells the web browser where to find the image file.

A name
B src
C id
D type

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1.1.6 Typical information that a developer needs to record during the version control process includes …

A security audits.
B tracking concurrency.
C who made changes to data.
D format of data

1.1.7 For VB.NET to connect to a database it needs to know the type of database and the path to the database file. The filename is stored in the … property.

A datasource
B provider
C connectionstring
D command

1.1.8 … is used when a developer wants the variable within a class to be protected against access from all external objects.

A Read only
B Shared
C Protected
D Private

1.1.9 Which ONE of the following software applications is NOT classified as a web browser?

A Google Chrome
B Outlook Express
C Mozilla Firefox
D Safari

1.1.10 <input type=”submit” value=”Send”> would cause the browser to create a …

A textbox
B checkbox
C button
D combo box

(10 × 1) (10)

NCV

1.2 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (1.2.1–1.2.10) in the ANSWER BOOK.

1.2.1 An object *objStudent* can be instantiated by implementing the statement *Dim objStudent As clsStudent*.

1.2.2 A foreign key is a primary key in one table that is placed into another table.

1.2.3 Copyright is a legal mechanism to protect intellectual property.

1.2.4 The body section of web pages includes information such as copyright and links to the privacy statement.

1.2.5 A plugin is software that can be added to a web browser to extend its functionality.

1.2.6 A constructor is a special method of a class or structure in object-oriented programming that initialises an object of that type.

1.2.7 Integration testing is the testing of the smallest modules of a system.

1.2.8 An applet is a small application written in the JavaScript language.

1.2.9 The DOCTYPE declaration is not an HTML tag, but rather an instruction to the web browser regarding the version of HTML the document is written in.

1.2.10 JavaScript language is NOT case sensitive.

(10 × 1) (10)

1.3 Give ONE term for each of the following descriptions. Write only the term next to the question number (1.3.1–1.3.5) in the ANSWER BOOK.

1.3.1 A payment made to someone whose ideas or inventions are used by someone else to generate money

1.3.2 When the database design has been normalised to at least this normal form, it is ready to be put into use

1.3.3 The OOP principle where a programmer hides all but the relevant data about an object in order to reduce complexity and increase efficiency

1.3.4 A command inserted in a HTML document that specifies how the document, or a portion of the document, should be formatted.

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1.3.5 A series of pictures that helps the developer to form a big picture of or visualise the application before building it

(5 × 1) (5)

[25]

TOTAL SECTION A: 25

SECTION B

QUESTION 2

2.1 Tabulate TWO differences between *object-oriented programming* and *procedural programming*. (2 × 2) (4)

2.2 The Namibian Cricket Board approached your company to help them design a software application that will assist in calculating the batting and bowling averages of their players. The program will need to capture the name, matches played, runs made and dismissals for each batsman and the name, matches played, wickets taken and runs against for each bowler. The program should calculate the bowling and batting averages of the players.

Create a class diagram based on the above scenario as follows:

2.2.1 Identify ALL the classes. (3)

2.2.2 Identify the attributes for the classes. (6)

2.2.3 Identify the methods for the different classes. (2)

2.2.4 Indicate inheritance. (1)

[16]

QUESTION 3

3.1 XYZ College has a database that contains information about their employees and the departments they work in. The database has two tables, namely *Departments* and *Employees.* A department may have zero, one or many employees working in that department, but an employee may work in one and only one department.

Table: Departments

Name	Ord	Data type	Size	Primary key
DeptNo	0	String	2	True
DeptName	1	String	25	False

The records in the departments table:

DeptNo	DeptName
10	Business Studies
11	Engineering Studies
12	Utility Studies
13	Educare
14	General Studies

Table: Employees

Name	Ord	Data Type	Size	Primary key
EmpNo	0	String	5	True
EmpName	1	String	25	False
EmpSurname	2	String	25	False
DeptNo	3	String	2	False

The records in the employees table:

EmpNo	EmpName	EmpSurname	DeptNo
10001	Vega	Jane	10
10002	Sonya	Blade	10
10003	Pagan	Min	12
10004	Zoltan	Chivay	14
10005	Triss	Merrigold	12
10006	Ajay	Ghale	11
10007	Booker	Dewitt	10
10008	Ivy	Pepper	14
10009	James	Gordon	13
10010	Barbara	Kean	14
10011	Ned	Stark	11
10012	Eddie	Riggs	13
10013	Blackfish	Tully	10
10014	Ada	Wong	12
10015	Solid	Snake	14

3.1.1 Write an SQL statement to retrieve the records as follows:

- Concatenate the name and surname of the employee to display the full name.
- Display the department name and NOT the department number.
- Order the records in ascending order according to the surname of the employee

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Below is an example of some of the retrieved records:

FullName	DeptName
Sonya Blade	Business Studies
Zoltan Chivay	General Studies
Booker Dewitt	Business Studies
Ajay Ghale	Engineering Studies
James Gordon	Educare
Vega Jane	Business Studies
Barbara Kean	General Studies
Triss Merrigold	Utility Studies
Pagan Min	Utility Studies
...	

(6)

3.2 Gotham City TVET College is a college situated in the heart of Gotham City. Gotham City College offers extra classes after school in a variety of subjects.

You study at Gotham City College and are enrolled in the NC(V) L4 IT and CS course. Ms Ivy Pepper is the guidance counsellor. She keeps track of all the students and the extra classes they attend after school. She is currently using a spreadsheet for this purpose, but needs a more flexible and robust solution and decided to use Microsoft Access instead. She asked you to help her design the database to track the extra classes for each student.

Below is a copy of the spreadsheet. Analyse the spreadsheet data and answer the questions.

Counsellor: Ms Ivy Pepper

Year: 2017

StudentNo	Name	Subject
201502312	Bruce Wayne	SAD L4
201608745	James Gordon	PCP L3, SAD L3, CHS L3
201609088	Oswald Cobblepot	SAD L3, ENG L3
201502312	Bruce Wayne	DCN L4
201702723	Alfred Pennyworth	ISD L2

NOTE: The database does not have to capture counsellor information. The database will keep track of extra classes for a one-year period only. Students may enrol for one or more afternoon class. There is only one afternoon class per subject.

Design the database tables for the given scenario. The database table should be in at least 3NF.

3.2.1 Indicate ALL tables. (3)

3.2.2 Indicate ALL fields per table. (3)

3.2.3 Indicate the primary and foreign keys. (4)

3.2.4 Indicate the relationships between the tables with cardinality. (2)
[18]

QUESTION 4

4.1 List THREE security threats computer users may face. (3)

4.2 Define the term *version control*. (2)

4.3 Give THREE advantages of HTML text editors. (3)

4.4 Write a line of JavaScript code that will:

4.4.1 Retrieve the last name from the following text field on a HTML form and store it in a variable called *lastname*

```
<label for=”lastname”>Last Name:</label>
<input type=”text” name=”lastname” id=”lastname”><br>
```
(3)

4.4.2 Store the length of the last name in a variable called *n* (2)
[13]

QUESTION 5

5.1 Telkom SA is offering an internet connection at a speed of 10 mbps.

What will the download time of a 3 541 kb file be? Show ALL calculations. (6)

5.2 Give FOUR disadvantages of web-based applications versus installed software. (4)

5.3 Discuss when to use each of the following image file formats:

5.3.1 GIF (2)

5.3.2 PNG (2)
[14]

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QUESTION 6

6.1 Explain TWO differences between raster (bitmap) images and vector graphics. (2 × 2) (4)

6.2 What is the purpose of server pages? (1)

6.3 Study the HTML code below and answer the questions.

```
<html>
  <head>
    <title>Learning HTML language />
     <style type=”text/css”>
        img.floatRight
              float: right
              border-left: 10px;
        }
    </style>
  </end head>
  < The body section starts here -->
  <body>
       <img file=”appletree.png” alt=”missing pic” id=”flloatRight”/>
  </body>
</html
```

6.3.1 Identify ALL syntax errors and correct ALL affected statements. (6)

6.3.2 Create a style for the body element. Set the background colour to white and align the text to the left. (3)

[14]

TOTAL SECTION B: 75
GRAND TOTAL: 100

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