higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

BASIC PRINCIPLES OF COMPUTER PROGRAMMING AND COMPUTER LITERACY

(First paper)
NQF LEVEL 2

(10041062)

20 November 2024 (Y-paper)
13:00–16:30

This question paper consists of 10 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
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NATIONAL CERTIFICATE (VOCATIONAL)
BASIC PRINCIPLES OF COMPUTER PROGRAMMING
AND COMPUTER LITERACY
(First paper)
NQF LEVEL 2
TIME: 3½ 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. Diagrams should be clear and neat and may be done in pencil.
7. 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 Data is stored in a computer's memory …

A as hexadecimal data.
B as binary data.
C as octal data.
D in plain text data.

1.2 Python is a/an … programming language.

A interpolated
B compiled
C interpreted
D manufactured

1.3 A(n) … is a named memory location of which the value can change while the program is running.

A constant
B variable
C RAM
D output

1.4 In a computer the … component is known as the 'processor'.

A RAM
B CMOS
C CPU
D basic input/output device

1.5 What built-in function should you use in Python to prompt a user for data input?

A Cin
B Prompt
C Input
D Get

1.6 What is the output of the following code?

```
value = '2' + '2'
print(value)
```

A The number '4'
B A type error, as integers cannot be concatenated
C A floating point value of 4.0
D The string '22'

1.7 Which of the following literals would be considered a float type in Python?

A -56
B 1.15
C '88'
D 7

1.8 Which of the following is NOT a valid name that can be used for a variable?

A 1ender
B Mark
C FirstName
D subtotal

1.9 The decimal number 39 in binary is … .

A 100111_2
B 100101_2
C 100110_2
D 101011_2

1.10 In Python, what does the '%' operator do in the expression 6 % 4?

A It performs an exponentiation to the 4th power.
B It returns a float as a result of division.
C It returns a remainder or modulus.
D It returns the percentage of the operation.

(10 × 1) **[10]**

QUESTION 2

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

2.1 In a centralised Version Control System each user has a separate copy of the full repository.

2.2 Git is an example of a Centralised Version Control System.

2.3 Solid state storage stores data in erasable, rewritable circuitry, rather than on spinning disks.

2.4 A Centralised Version Control System is easy to set up.

2.5 RAM is a computer's permanent memory.

(5 × 1) **[5]**

QUESTION 3

Choose an item from COLUMN B that matches a description in COLUMN A. Write only the letter (A–L) next to the question number (3.1–3.10) in the ANSWER BOOK.

COLUMN A		COLUMN B	
3.1	A Windows command to rename a file	A	AND
3.2	A diagrammatic solution to a problem	B	string
3.3	Instructions that tell the computer what to do	C	ren
3.4	Allows programmers to program with graphical elements instead of textual code	D	OR
3.5	This is a programming structure used to ask a question, and, depending on the answer, one of two courses of action can be taken	E	decision structure
3.6	Equipment, or the physical devices, associated with a computer	F	loop structure
3.7	A combination of letters, digits and symbols	G	computational thinking
3.8	Enables us to tackle large difficult problems and break them into manageable parts	H	syntax
3.9	An operator used to join expressions and the expression will be true only if both conditions are true	I	VPL
3.10	The rules that govern a programming language	J	software
		K	hardware
		L	flow chart

(10 × 1) **[10]**

QUESTION 4

Choose the correct option of those given in brackets to complete the following sentences. Write only the answer next to the question number (4.1–4.5) in the ANSWER BOOK.

4.1 The Windows (dir/cd) command is used to list the contents of the current folder.

4.2 A (bit/byte) is used to represent 8 binary digits.

4.3 (Decomposition/Abstraction) is a component of computational thinking that refers to the process of identifying and concentrating on the important and generic information only.

4.4 In Python, the term (scope/range) is used to describe the area in the program where a variable is accessible.

4.5 One of the benefits of modular programming is (reusability/security).

(5 × 1) **[5]**

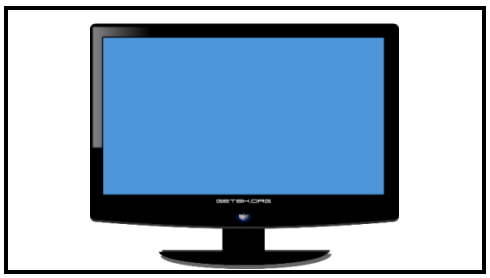
TOTAL SECTION A: 30

SECTION B

QUESTION 5

5.1 Write only the word or words that describe what each of the following pictures represents next to the question number (5.1.1–5.1.5) in the ANSWER BOOK.

5.1.1



5.1.2



5.1.3



5.1.4



5.1.5



(5 × 1) (5)

5.2 Give a brief definition of a single-board computer. (2)

5.3 A Windows command prompt is shown below.

```
 Directory of C:\Users\i5\Documents\BPCL L2

2024/08/12  22:14    <DIR>          .
2024/08/12  22:14    <DIR>          ..
2024/08/12  22:13    <DIR>          Activities
2022/07/22  09:54             6 187 AssessmentRecord.xlsx
2024/08/12  22:12    <DIR>          Exams
2022/07/22  09:54                 0 Test1.txt
2022/07/21  10:56            12 252 Test2.docx
2023/08/20  16:45    <DIR>          Tests
               3 File(s)         18 439 bytes
               5 Dir(s)   6 111 657 984 bytes free
```

5.3.1 Write the Windows command to change the name of the file **AssessmentRecord.xlsx** to **Marks.xlsx**. (2)

5.3.2 Write the Windows command to copy the file **Test2.docx** to the folder **Tests**. (2)

5.3.3 Write the Windows command to create a new folder called **Results** in the current directory. (1)

5.3.4 Write the Windows command to display the details about your computer system. (1)

[13]

QUESTION 6

6.1 Name and briefly describe the FIVE phases of the PDLC (Program Development Life Cycle). (5 × 2) (10)

6.2 Read the article below and answer the questions:

What is version control?

Version control, also known as source control, is the practice of tracking and managing changes to software code. Version control systems are software tools that help software teams manage changes to source code over time. As development environments have accelerated, version control systems help software teams work faster and smarter. They are especially useful for DevOps teams as they help them to reduce development time and increase successful deployments.

Version control software keeps track of every modification to the code in a special kind of database. If a mistake is made, developers can turn back the clock and compare earlier versions of the code to help fix the mistake while minimising disruption to all team members.

[Adapted from: *https://www.atlassian.com/git/tutorials/what-is-version-control*]

6.2.1 Name the TWO main components of a software revision. (2 × 1) (2)

6.2.2 The article makes mention of a 'special kind of database'.

What is the correct name for this database? (1)

6.2.3 Copy the following table in the ANSWER BOOK and complete it by stating TWO differences between a *Branch* and a *Trunk* as used in Version Control Systems.

BRANCH	TRUNK

(2 × 2) (4)

[17]

QUESTION 7

7.1 Evaluate the following Boolean expression and show all the steps.
8 % 2 < 5 OR NOT (4 * 4 == 16) (4)

7.2 Convert the decimal number **175_{10}** to binary. Show all the steps and include the base indicator. (4)

7.3 Study the scenario and IPO chart below and answer the questions:

Scenario

You are required to design a program that will determine the selling price of an item. The user will be prompted for the purchase price.

The selling price will then be calculated as follows:

- If the purchase price is less than R1000, then the selling price should be the purchase price increased by 10%.
- If the purchase price is R1000 or more, then the selling price should be the purchase price increased by 20%.

The calculated selling price must then be displayed.

IPO Chart

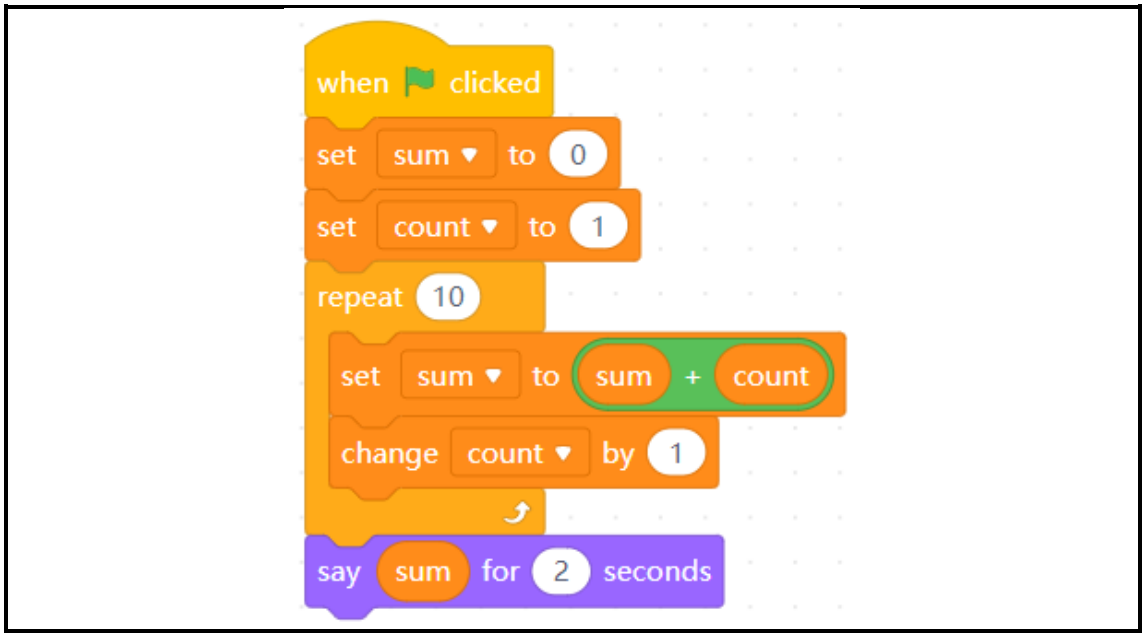
I	P	O

purch_price	If the purch_price is less than 1000 then
	sell_price = purch_price increased by 10%
	else
	sell_price = purch_price increased by 20%
		sell_price

7.3.1 Expand the acronym IPO. (1)

7.3.2 Draw the flow chart for the given problem above. (6)

7.4 Study the Scratch code snippet below and answer the questions:



7.4.1 Scratch is a block-based programming language.

State TWO advantages of using this language. (2)

7.4.2 Give the variables in the program above. (2)

7.4.3 Briefly explain what the above program is doing. (2)

7.4.4 Give the output of the program. (1)

[22]

QUESTION 8

8.1 8.1.1 Briefly explain of the term *comments.* (2)

8.1.2 Give the symbol used to create comments in Python (1)

8.2 Draw a diagram and explain Python's traditional runtime execution model. The diagram should describe the three stages from source to runtime. (6)

8.3 Study the following Python program and answer the questions:

```
1  import math
2
3  radius = float(input("Enter the radius for cylinder: "))
4  height = float(input("Enter the height for cylinder: "))
5
6
7  def calc():
8
9      result = math.pow(radius,2) * math.pi * height
10     print(" Result = {:.2}".format(result))
11
12
13 print("Perform calculation")
14 calc()
```

8.3.1 Give the module/library used as part of the program.

8.3.2 Insert a comment for line 2 that describes lines 3 and 4.

8.3.3 What is the purpose of the float() function in lines 3 and 4?

8.3.4 Give the name of the user-defined function in the above code.

8.3.5 State the line in the code where the user-defined function is being called.

8.3.6 Briefly describe what this program does.

8.3.7 Explain the purpose for {:.2} used in line 10.

(7 × 1) (7)

8.4 Give TWO examples of data structures found in Python. (2)

[18]

TOTAL SECTION B: 70
GRAND TOTAL: 100

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