higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

INTRODUCTION TO TECHNICAL PROGRAMMING
NQF LEVEL 3
(First paper)

20 November 2024

This marking guideline consists of 8 pages.

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SECTION A

QUESTION 1

1.1 B✓
1.2 A✓
1.3 A✓
1.4 C✓
1.5 B✓
1.6 B✓
1.7 A✓
1.8 C✓
1.9 C✓
1.10 B✓

(10 × 1) **[10]**

QUESTION 2

2.1 False ✓
2.2 False ✓
2.3 False ✓
2.4 True ✓
2.5 True ✓

(5 × 1) **[5]**

QUESTION 3

3.1 K✓
3.2 M✓
3.3 H✓
3.4 D✓
3.5 I✓
3.6 E✓
3.7 G✓
3.8 F✓
3.9 A✓
3.10 C✓

(10 × 1) **[10]**

QUESTION 4

4.1 ROM ✓
4.2 mv ✓
4.3 extraction ✓
4.4 interpreter ✓
4.5 commit ✓

(5 × 1) **[5]**

TOTAL SECTION A: 30

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SECTION B

QUESTION 5

5.1 5.1.1 Motherboard – Also known as a system board, is the main circuit board of the computer. Many electronic components such as the processor, memory and storage devices are attached to the motherboard.✓✓

5.1.2 Cache memory – Chip-based computer memory used by the CPU to store and access data.✓✓

5.1.3 Microcontroller – A single integrated chip that contains all the components of a small computer system and that is designed to perform a specific task.✓✓

5.1.4 Microprocessor – A powerful CPU on a single chip that must be connected to supporting components on a board✓✓

5.1.5 CPU – Central Processing Unit is a small chip inside the computer responsible for controlling the hardware devices of the computer.✓✓

(5 × 2) (10)

5.2 TWO advantages of using online software:

- There is no need for download or installation.
- Software is updated automatically.
- There is less space taken up on your device.

Allocate ONE mark for each appropriate advantage listed. ✓✓ (2)

5.3 5.3.1 Command Line Interface✓
5.3.2 man ls✓
5.3.3 mkdir Assessments✓
5.3.4 mv Test1.docx Assignment1.docx✓

(4 × 1) (4)

[16]

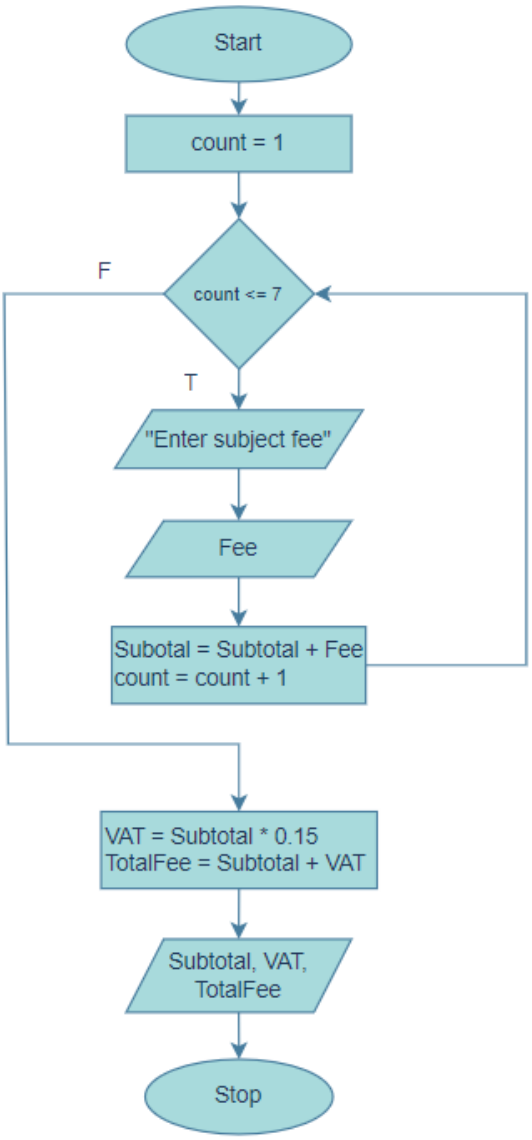
QUESTION 6

6.1 6.1.1 IPO Chart:

Input	Processing	Output
Fees for 7 subjects✓	Loop 7 times✓ Enter - Fee Subtotal = Subtotal + Fee✓ End loop VAT = Subtotal * 0.15✓ TotalFees = Subtotal + VAT✓	Subtotal VAT TotalFees✓

Allocate ONE mark for Input, ONE mark for Output and 4 marks for Processing. (6)

6.1.2 Flowchart:



(7)

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- Terminal Symbols✓
- Input✓
- Decision box with correct condition ✓
- Loop✓
- Calculations✓✓

Output✓

6.2 6.2.1 Evaluate (x > y): 10 > 5 This is true. ✓ (4)
Evaluate (y != 0): 5 != 0 This is true. ✓

Combine the results using AND (&&):
true && true ✓

This evaluates to true. ✓
Therefore, the final value stored result is true.

6.2.2 Result will still evaluate to true = true || true is true (1)

6.2.3 short ✓
long ✓ (2)
[20]

QUESTION 7

7.1 Compiled ✓ (1)

7.2 7.2.1 Debugging – refers to the process of identifying and correcting errors in your software application.✓✓ (2)

7.2.2

Syntax errors	Logic errors
Syntax errors are errors that occur when the rules of a programming language are not followed.✓	Logic errors are errors that occur when the programmer uses the incorrect algorithm.✓

(2)

7.2.3 Line 9✓ Logic error✓ (2)

7.2.4 selling_price = cost_price + ✓ (cost_price * VAT); (1)

7.3 7.3.1

```
while (!valid_input) {    // Given
  cout << "Enter a number: ";
  cin >> answer;   ✓

  if (answer >= 0 && answer <= 55) { ✓✓
       cout << "Valid input" << endl; ✓
       valid_input = true; ✓✓
  } else {
       cout << "Invalid input.";
       cout << "Please enter a number between "
            << "0 and 55." << endl;  ✓
       }
   } // end while
```

(7)

7.3.2 To indicate that the program has executed successfully and terminated without any errors. (1)

[16]

QUESTION 8

8.1 8.1.1 Global variables✓ (1)

8.1.2
- Functions are a way of modularising your program into parts that perform certain tasks.
- You can call up a function many times instead of rewriting the same code in your program.

Allocate ONE mark for each appropriate purpose.✓✓ (2)

8.1.3 Function prototype – Code statement that tells the compiler the name of a function, its return type and the data type of its parameters.✓✓ (2)

8.1.4 Line 3 OR Line 4.✓ Accept either answer. (1)

8.1.5 Line 21 – The function volumeFunc() is being called✓ and the returned value is stored in a variable volume.✓ (2)

8.2
```
#include <iostream>
#include <cstdlib>  ✓
#include <ctime>    ✓

using namespace std;

int main() {
    // Seed the random number generator
    srand(time(0));   ✓

    for (int i = 0; i < 10; i++) { ✓
        // Generate random number between 10 and 30 (inclusive)
        int n = rand() % 21 + 10; ✓✓
        cout << n << endl; ✓
    }

    return 0;
}
```
(7)
[15]

QUESTION 9

9.1 9.1.1 A one-dimensional array is a data structure that stores a collection of elements ✓of the same data type ✓ in a contiguous block of memory, where each element can be accessed using a single index. (2)

9.1.2 float sales[7] = {0};✓ (1)

9.1.3 7✓ (1)

9.1.4 0✓ (1)

9.1.5 index < 7 OR index <= 6✓ Accept either answer. (1)

9.1.6 avg = sum / 7;✓ (1)

9.2 9.2.1 A class is a user-defined data type that serves as a blueprint for creating objects ✓ . It encapsulates data and the functions that operate on that data into a single unit. ✓ (2)

9.2.2 6✓ (1)

9.2.3 Cylinder ✓ (1)

9.2.4 Cylinder myShape ✓;

The class name must be first, followed by the object name. No marks if they are swapped. (1)

9.2.5 By calling the display method (1)

OR

myShape.display();✓

9.3

```
November_Examination_2024✓✓
Length of s4 is: 25✓
Exam✓
```

(4)

9.4

```
cout << "He said, \"✓Don't forget to use the '\\t✓' for
tabs!\"\n✓\t✓This line starts with a tab." << endl;
```

(4)

Mark allocation 1 mark each

\" is used to display double quotes within the string.
'\\t' is used to display the literal '\t' in the output.
\n is used for a new line.
\t at the beginning of the second line creates a tab indent.

9.5 It generates a string ✓with three random letters ✓ from the sABC variable (2)
[23]

TOTAL SECTION B: 90
GRAND TOTAL: 120

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