UNIVERSITY EXAMINATIONS

UNISA university of south africa

JANUARY/FEBRUARY 2022

COS1511

Introduction to Programming I

Welcome to COS1511 exam.

This paper consists of 8 pages.

Instructions:.

- Remember to accept the pledge of Honesty by clicking to activate it

Additional student instructions

1. Students must upload their answer scripts in a single PDF file (answer scripts must not be password protected or uploaded as “read only” files)
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3. NO emailed scripts will be accepted.
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Open Rubric

UNIVERSITY EXAMINATIONS

UNIVERSITEITSEKSAMENS

UNISA university of south africa

COS1511

Jan/Feb 2022

Introduction to Programming I

Duration : 2 Hours

80 marks

EXAMINERS :

FIRST : MS P MVELASE
SECOND : DR MA SCHOEMAN

Use of a non-programmable pocket calculator is permissible.

Closed book examination.

This examination question paper remains the property of the University of South Africa and may not be removed from the examination venue.

This paper consists of 8 pages.
Out of 80 marks

INSTRUCTIONS:

1. Answer all the questions on a Word document/by hand and convert to PDF.
2. Number your answers and label your rough work clearly.
4. Marks are awarded for part of an answer, so do whatever you are able to in each question.

ALL THE BEST

QUESTION 1	6 marks

Complete the statements by providing only the missing words:

1.1 The only way to access a local variable of a calling function from the function it calls is to use a …… parameter. (1)

1.2 The only special character allowed in a variable name in C++ is …… (1)

1.3 A loop construct that is guaranteed to execute at least once is the ……. loop. (1)

1.4 An array index in C++ always starts from …… (1)

1.5 Consider the statement

```
string name = "Joe Soap";
```

Write the `if` condition that will check whether the first name in the string is "Joe" or not. (2)

QUESTION 2	5 marks

State whether the following statements are true or false:

2.1 A variable name in C++ can start with a number. (1)

2.2 The operator to check for equality is = . (1)

2.3 A `return` statement in a function returns only one value. (1)

2.4 The logical AND operator in C++ is & . (1)

2.5 The last element in a ten element one dimensional array has the index of 9. (1)

QUESTION 3	5 marks

3.1 Name a primitive data type in C++. (1)

3.2 Name a stream manipulator in C++. (1)

3.3 Add brackets to the following expression to get the answer zero. (1)
2 + 8 / 2 - 5

3.4 Name a data structure in C++. (1)

3.5 Given the statement `int ages[10] = {0};` what is the value of the element `age[5]`? (1)

QUESTION 4	24 marks

Given the following program code to calculate the year mark for a student.
The assignment marks are collected in the array variable `assignMarks[]`.

Assignment one counts 30%, assignment two counts 40% and assignment three counts 30% towards the year mark.

The three assignments count 20% towards the module mark. The exam mark counts 80% towards the module mark.

Complete the following code by providing only the missing values at **`4.1 to 4.12`**. (2 marks each)

```
#include <iostream>
#include <string>
using 4.1_____ std;


float calcYearMark(float assignMarksP[])
{
     float yearMark = 0;
     assignMarksP[0] = assignMarksP[0] * 0.3;
     assignMarksP[1] = assignMarksP[1] * 0.4;
     assignMarksP[2] = assignMarksP[2] * 0.3;

    for(int assign = 4.2____; assign < 3; assign += 1)
    {
        yearMark += assignMarksP[4.3_____];
    }
     return  4.4_____;
}
void calcModuleMark(float  finalYearMarkP, float examMarkP,
                    float  & 4.5_____)
{
    examMarkP = examMarkP * 4.6____;
    finalYearMarkP = finalYearMarkP * 0.2;
    moduleMarkP = 4.7____ + 4.8____;
}



int main()
{
    int numAssign;
    float finalYearMark, examMark = 60.0, moduleMark = 0.0;
    float assignMarks[] = {50,65,70};
```

```
    string outcome;

    finalYearMark = 4.9____(assignMarks);
    calcModuleMark(finalYearMark, 4.10____,moduleMark);
    if(4.11____ >= 50)

        outcome = "passed";
    else
        outcome = "failed";

    cout << "The semester mark for the assignments is "
         << finalYearMark << endl;
    cout << "The exam mark is " << examMark << endl;
    cout << "The student's mark for the module is "
         << 4.12____ << ". The student has " << outcome;


    return 0;
}
```

QUESTION 5	6 marks

Write a function header for each of the following:

5.1 A function `calcOutcome` that receives a student's `moduleMark` and then returns true if the `moduleMark` is greater than 50, or else returns false. (2)

5.2 A function `calcAverage` that receives a one-dimensional array `assignMarks` and its size as parameters; then calculates and returns the average of the assignment marks. (2)

5.3 A `void` function `multiply`, that receives an integer as a parameter and multiply it by two. The changed value is reflected in the calling program. (2)

QUESTION 6	14 marks

6. 1 All characters have an integer value associated with it called the ASCII value, for instance the ASCII value of 'A' is 65, ASCII value of B is 66 etc. What is the output of the following code? (4)

```
#include <iostream>
using namespace std;
int main ()
{
     char c = 'A';
     int letter = c + 1;
     cout << letter << endl;
     cout << char(letter) << endl;
     return 0;
```

```
}
```

6.2 The code below prints 2 lines containing 6 asterisks each. Fill in the missing values for 6.2.1 and 6.2.2. (4)

```
for (int outer = 1; outer <= 6.2.1_____; outer = outer + 1)
{
     for (int inner = 1; inner <= 6.2.2_______; inner = inner + 1)
          cout << "*";
     cout << endl;
}
```

6.3 What is the output of the following code? (4)

```
int age = 13;

cout << "Teenagers" << endl;

while (age < 19)
{
  age++;
  cout << age << " ";
}
```

6.4 What is the output of the following code? (2)

```
#include <iostream>
using namespace std;

void calcVAT(float priceP, float & vatP)
{
    vatP = priceP * 0.15;
}
int main()
{
    float vat, price = 100.00;
    calcVAT(price,vat);
    cout << vat << " Rands" << endl;
    return 0;
}
```

QUESTION 7	14 marks

Sam is saving to buy a motor car. He decides to save a certain amount in the first month and then double the amount that he saves every month. (Thus, suppose he saved R10 in the first month. Then he will save R20 in the second month, in the third month he will save R40, in the fourth month R80, etc.)

He wants to know how much he will have saved in a year's time (12 months). Fill in the missing values from 7.1 to 7.7 . Write ONLY the missing values. (14)

```
#include <iostream>
using namespace std;
float amountAfterYear(7.1_____ startingAmountP)
{

     float finalAmount;
     finalAmount = 7.2_____;
     cout << "Month 1 has a starting amount of R "
          << 7.3_____ << endl;


     for (int i = 2; i <= 12; i++)
     {
          finalAmount = 7.4_____ * finalAmount;
          cout << "Month " << i

          << " final amount R " << 7.5_____ << endl;
     }


     return finalAmount;
}


int main ()
{
    float startingAmount = 10.0; // amount saved in month 1
    float savings; // amount saved after 12 months

    savings = amountAfterYear(7.6_____);

    cout << "Total savings after 12 months: R " << 7.7_____;
    return 0;
}
```

QUESTION 8	6 marks

The program below asks the user to input a string and a single character and checks for the occurrence of the character in the string and displays an appropriate message on whether the character appears in the string or not. Write ONLY the answers for the 8.1 to 8.3

[You may find the table of string functions given below useful]. (6)

```
#include <iostream>
using namespace std;

int main()
{
    string str;
    char ch;

    cout << "Enter a string:" << endl;
    cin >> str;
    cout << "Enter a character:" << endl;
    cin >> ch;

    8.1_____(str. 8.2_____(ch) == -1)
    {
        cout << "The character does not occur in the string" << endl;
    }
    8.3_____
        cout << "The character occurs in the string." << endl;
    return 0;
}
```

A number of **`string`** member functions to help you

```
StringObject.size( )

StringObject.substr(startPos, length)

StringObject.find(substring)

StringObject.find(substring, startPos)

StringObject.insert(insertPos, substring);

StringObject.erase(startPos, length);

StringObject.replace(startPos, length, substring);
```

where `startPos`, `length`and `insertPos`are of type `int`, and `substring`is of type `string`.

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