University of Swaziland

Department of Computer Science

Examination(Main)

2017/2018

Second Semester

Title of Paper: Computer Programming I

Course Code: CSC112

Time Allowed: Three (3) Hours

Instructions: Answer any **four Questions.** Don't write anything on the Examination Question paper.

You are not allowed to open this paper until you have been told to do so by the invigilator.

CSC112: COMPUTER PROGRAMMING I
SECOND SEMESTER 2017/2018 SESSION
INSTRUCTION: ANSWER QUESTION ONE AND ANY OTHER THREE QUESTIONS
TIME ALLOWED: THREE (3) HOURS

QUESTION ONE

a) Write a C/C++ program to find the average of ten numbers using a cast operator   5marks

b) The following code fragment uses a function sum to calculate the sum of two numbers.

```
void sum(int, const int&, int& );
int main()
{
int a = 5;
int b = 10;
int result;
sum(a,b,result);
}
void sum(int a, const int& b, int& c)
{
c = a+b;
}
```

    i.   What are the actual parameters of the function sum   3marks

    ii.   Which of the parameters are passed by constant reference?   1mark

    iii.   Which of the parameters is passed by value?   1mark

c) Write a C++ program to implement the algorithm below

Algorithm

Step 1: Declare the variables

Step 2: set the output of the floating-point numbers to two decimal places in a fixed decimal format with a decimal point and trailing zeros.

Step 3:prompt the user to enter a movie name that contain more than one words

Step 4: input the movie name.

Step 5: prompt the user to enter the price of an adult ticket

Step 6: input the price of the adult ticket

Step 7: prompt the user to enter the price of a child ticket

Step 8: input the price of the child ticket

Step 9:prompt the user to enter the number of adult ticket sold

Step 10: input the number of adult ticket sold

Step 11:prompt the user to enter the number of child ticket sold

Step 12: input the number of child ticket sold

Step 13:prompt the user to enter the percentage of the gross amount donated

Step 14:input the percentage of the gross amount donated

Step 15: calculate the gross amount

Step 16: calculate the amount donated

Step 17: calculate the net sale amount

Step 18: output the results

<div align="center">10marks</div>

d) What is the value printed for variable delta if the following code is executed?

```
int delta =0, x=3;
if(x%2 == 1)
delta = delta + x;
x++;
if(x%2 == 0)
delta = delta + x;
x++;
cout << delta;                                    5marks
```

QUESTION TWO
a) Write a C/C++ program to determine the number of bytes required to store integer type value, float type value, char type value and double type value   10marks
b) Differentiate between the following
i. scanf and cin   2marks
ii. getchar and putchar   2marks
iii.local and global variables   2marks
iv.post-decrement and pre-decrement   2marks
v. bitwise left shift operator and bitwise right shift operator   2marks
c) What is the value stored in c? Show all workings with the explanation of the operators

```
int a=4,b=9,c;
c = a++ + ++b;                                    5marks
```

QUESTION THREE
a) Write short notes on any four tokens used in C/C++   8marks
b) List and explain six escape sequence character in C/C++   6marks
c) Write a C/C++ program to print octal number equivalent of a given number in base 4 and the hexadecimal number equivalent of a given number in base four. Assuming the given number is 1123, you are expected to convert it to decimal number first in your program before converting it to octal and hexadecimal. In addition, Show all workings to support the output of your program.   11marks

QUESTION FOUR
a) List and explain all the tokens used in C/C++.   8marks
b) Write a C++ program to read two matrices and multiply them using a fixed loop   12marks
c) consider the following statement

```
string str="This summer we will drive across the country!";
string str1="very";
string str2="I";
```

what is the output of the following statements?(Assume that all parts are independent of each other)

i.	cout<<str.empty<<endl;	
ii.	cout<<str.substr(12,20)<<endl;	
iii.	cout<<str.length<<endl;	
iv.	cout<<str.insert(5,str1)<<endl;	
v.	cout<<str.replace(0,14,str2)<<endl;	5marks

QUESTION FIVE

a) Write a short note on the order of precedence of operators considering arithmetic operators, unary operators and decrement & increment operators.   10marks

b) Write a C++ program to solve a linear equation involving two unknowns using if statement
                                                                                                                            10marks

c) Write each of the following as a C++ expression

i. Assign the string "C++ programming is exciting" to the variable str

ii. Assign the value 12 times feet plus inches to totalinches

iii.Increment the value of the int variable I by 1

    iv. 9.0 divided by 5times c plus 32

    v. Round the decimal number x to the nearest integer   5marks

QUESTION SIX

a) Write a C++ program to find the factorial of a given number using a pre-test loop   7marks

b) List and explain six commonly used output manipulators in C++   9marks

c) Suppose a and b are int variables, c is a double variable and a=25, b=20 and c=25.0. What is the output of each of the following statements?

i.cout<<a / static_cast<double>(b)<<endl;

ii. cout<<62%28+a/c<<endl;

iii.cout<<static_cast<int>(c) %3+7<<endl;

iv.cout<<22.5/2+14.0*3.5+28<<endl;

v.cout<<2/(c-static_cast<int>(c+1.2))<<endl;

vi.cout<<a+b/2.0+1.5*c<<endl;

                                                                                                                            9marks