EASTERN UNIVERSITY, SRI LANKA

DEPARTMENT OF MATHEMATICS

FIRST YEAR EXAMINATION IN SCIENCE - 2016/2017

FIRST SEMESTER (AUG./SEP., 2018)

CS 103 - INTRODUCTION TO PROGRAM DESIGN AND PROGRAMMING

REPEAT

Answer all questions | Time allowed: Two Hours

Q1. Computer Programming is the process of creating computer programs. A program is a set of instructions that tells the computer what to do.

a. Briefly describe the following terms:

i. Software;

ii. Machine Language;

iii. Assembly Language;

iv. High-Level Language. [8%]

b. Briefly explain the difference between the terms *interpreter* and *assembler*. [3%]

c. List down the types of errors that can be present in C++ programming and give two examples for each type of errors. [6%]

d. Construct a flowchart and corresponding pseudocode to solve the following problem: Assume the input for a student is *name*, student *number*, and three *grades*. Output the student *name* and *S* (Success) if the average of the three grades is 65 or more. Otherwise (else), output the student's *name*, *U* (Unsuccess), and the number of additional points needed for *S*. [8%]

Q2. The tokens that can be used to construct the high- level language program is known as basic elements.

a. Explain the following terms using suitable examples:

i. comments;

ii. data types;

iii. constants;

iv. identifiers.

b. State whether the following variable names are valid/invalid. Give reason invalid.

Variable name	valid/ invalid	Reason, if valid
C_area		
(radius)		
byte		
_Num 1		
25^2		
Mr.Gates		
$_double		
int 1		

c. Give the value that the variable on the left hand side will hold in the fo statements:

```
float a= 41/23;
int b=5 * 6/4 + 4/5 + 6;
int c=100 + 100>100?10:20;
int e= 20%7 / 2*3;
a+=b-c*2%e;
```

d. The following program has syntax errors. Identify the errors in the progr debug the code. Assume that all the header files are included. (Use the given in below to illustrate your answer)

```
const char = STAR ='*'
const int PRIME = 71;
int main {
    int count, sum;
    double x;
    count =1;
    sum = count + PRIME;
    x := 25.67;
    newNum = count * star + 2;
    sum + count = sum;
    x = x + sum * COUNT;
    cout << " count = " << count;
```

```
        cout<< ," sum = " << sum;
        cout<< ", PRIME = " << Prime <<endl;
    }
```

Line No	Incorrect Code	Correct Code

[8%]

3. The flow of control jumps from one part of the program to another, depending on calculations performed in the program are called control structures.

a. Compare the *while* and *do-while* loops with suitable example. [5%]

b. Convert the following,

if to switch	**if to ternary operator**	**while to for**

if($n == 1 \parallel n == 2$)
cout<<"Good";
else{
if($n == 3$)
cout<<"Fair";
else
cout<<"Poor";
}
	if($n > m$){
	s=n-m;
	}
	else{
	s=m-n;
	}
		int i=1;
		while(i<5){
		if(i%2==1)
		cout<<"Hello World"<<i;
		i++;
		}

[6%]

c. Consider the following code segment.

```
#include<iosteram>
#include<conio>
int main {
        int x, y,z,q=0
        cout<<Enter the number<endl;
        cin>>x.
        y=x;
        while(y>0) {
                z=y%10;
                y=y/10
                q=q*10+z;
};
```

```
cout<<"Output of "<<x<<" is"<<q
_getch();
return;
```

i. Above code segment has syntactical errors. Rewrite the code segment errors.

ii. Write the outputs for the following input values: (Show the appropriat

- 2465
- 409

d. Write C++ statements for the following:

i. an array of floating point values with size 5;

ii. Prompt the user to enter the array values;

iii. Find the average of the floating point values in the array.

Q4. Function/method is a group of statements that together perform a task. It can to define reusable code and organize and simplify coding.

a. Briefly explain the three parts in a function with suitable example.

b. Write a void function named *divide()* to read 2 numbers from the user a print the answer of division and reminder(first number divided by second n

c. Write short notes of the following:

i. struct;

ii. pointer;

iii. parameter passing by value.

d. Write a declaration for each of the following:

i. A pointer variable *Pi* pointing to an array of 8 floats;

ii. A pointer variable *Ptr* pointing to pointer *PPtr* to an integer *var*;

iii. A function *sum* with a integer parameter and double parameter;

iv. A struct people with 2 integer components and a string component.