EASTERN UNIVERSITY, SRI LANKA

DEPARTMENT OF MATHEMATICS

EXTERNAL DEGREE EXAMINATION IN SCIENCE

FIRST YEAR EXAMINATION IN SCIENCE (2008/2009)

FIRST SEMESTER (Jan./Sept. 2015)

EXTCS 103 – INTRODUCTION TO PROGRAMME DESIGN & PROGRAMMING

REPEAT

NSWER ALL QUESTIONS — TIME: TWO HOURS

)1)

a. What is meant by programming in C++?

b. List any 5 keywords in C++ Language.

c. What are the differences between flowchart and Pseudocode?

d. Draw the flow chart for the following control structures:

   i. If – else;

   ii. For loop;

   iii. While loop;

   iv. Do – while.

e. If the ages of Ajay, Babu and Chandra are input by the user, draw a flowchart to determine the eldest of the three.

f. Write C++ programs to display the following pattern:

```
                *
              * A *
            * A * A *
          * A * A * A *
        * A * A * A * A *
      * A * A * A * A * A *
    * A * A * A * A * A * A *
  * A * A * A * A * A * A * A *
```

Q2)

a. List six types of C++ operators.

b. Consider the following code segment.

```
#include<iostream>
#include<conio>
int main
{
        clrscr();
        int n,t,r,p=0

        cout<<Enter the number;
        cin>>n.
        t=n;

        while(t > 0)
        {
                r = t%10;
                t = t/10
                p = p*10 + r;
        };

        cout<<"Output of "<<n<<" is "<<p
        getch();
        return 0;
```

i. This code segment has 10 syntactical errors. Write the above code seg without any errors.

ii. Write the outputs for the following input values:

(Show the appropriate steps)

a) 26;

b) 103;

c) 1234.

iii. Modify the above code segment to calculate the digits sum of given in number.

Hint: digits sum of 143 is 8. (i.e. 1+4+3=8).

c. Write a C++ program that simulates a simple calculator using *switch* statements. It reads two integers and a character.
If the character is a +, the sum is printed;
if it is a -, the difference is printed;
if it is a *, the product is printed;
if it is a /, the quotient is printed;
and if it is a %, the remainder is printed.

Q3)

a. Write a C++ program to calculate the sum of first 100 natural numbers.

b. Write a C++ program which accepts a character and display its next character.(Hint : If you give input as 'P' then the output will be display as Next character is : 'Q').

c. Write a C++ program to find the sum and average of one dimensional integer array.

d. Write the following function to find the length of a string:
int length(char S[ ]).

e. Write the following function to count the number of words in a string:
void count(char S[ ]).

f. Write the function to concatenate the contents of string S2 to S1:
void concat(char S1[ ], char S2[ ]).

Q4)

a. What is meant by *pointer* in C++?

b. Write the output of the following code segment.

```
void pointerTest( )
{
int a=10, b=20, c=30, *p, *q, *r;
p = &a;
q = &b;
 r = &c;
c = *p;
p = q;
q = r;
a = ++*q;
c = ++*p  +  *q ;
cout<<"a= "<<a<<endl;
cout<<"b= "<<b<<endl;
cout<<"c= "<<c<<endl;
cout<<"*p= "<<*p<<endl;
cout<<"*q= "<<*q<<endl;
cout<<"*r= "<<*r<<endl;
}
```

c. Briefly explain the *structure* in C++.

d. Declare a structure for an employer's record consisting of the following fields: Name, Sex, Address, Basic salary, Tax and Total salary.

If the employer's basic salary is greater than Rs 50000 then 5% of basic salary reduced as a tax.

Total salary = Basic salary - Tax.

Write a C++ program to keep records for 10 employers to do the following task

i. Read the Name, Sex, Address and Basic salary;

ii. Calculate the Tax and Total salary of each employer;

iii. Display the Name, Sex, Address, Basic salary, Tax and Total salary of employer.

****** End ******