EASTERN UNIVERSITY, SRI LANKA

FIRST EXAMINATION IN SCIENCE 2001/2002

FIRST SEMESTER (April, 2002)

CS 103 - Introduction to Program Design and Programming

Answer All Questions

Time: 2 Hours

(a) List all the fundamental data types available in C++. Give example values of each data type.

(b) State clearly what a variable is and state clearly the rules to form a variable name. Show with suitable examples how you would declare a variable of a given value and assign a given value to a variable.

(c) List all the arithmetic operators and the relational operators available in C++.

(d) Show how two strings can be compared for equality in C++.

(e) Describe briefly a method to input strings from the keyboard.

(f) Describe briefly the facility in C++ to display an output.

(g) Show how you would display real numbers with 3 digits after decimal point

(a) Describe briefly the conditional statements, **for-loop** and **while-loop** in C++ with the aid of flow diagrams.

(b) Write statements in C++ to do each of the following:

(i) to set **dsqr** to b^2-4ac

(ii) to check whether **dsqr** is non-negative and if so set x to $\left(-b+\sqrt{b^2-4ac}\right)/(2a)$ otherwise set x to -99999

(iii) to return the number of days in a month

(iv) to return true if a given year is a leap year, and false if not

(v) to print the first 100 positive odd numbers

(vi) to read a list of integers until -1 is read

(vii) to print stars of 10 rows in a triangular form: the i^{th} row has 2i-1 stars as in

```
                *
              * * *
            * * * * *
          * * * * * * *
        * * * * * * * * *
      .....................
    .........................
```

(a) Describe the parameter passing mechanism of C++ functions.

(b) Write a function to swap values of two **float** variables.

(c) Write a function to compare two strings. If they are same your function should return a **false** value otherwise return a **true** value.

(d) Write a function

```
void OctIn(int & n);
```

that reads a base 8 (octal) number and assigns it to n.

Use *OctIn* in a main program that reads a set of octal numbers and prints the decimal equivalent.

(a) What is meant by a pointer?
How would you create a pointer variable?

(b) Describe the functionalities of **referencing operator** (&) and **dereferencing operator** (*).

(c) Create a **dynamic array** of N **float** elements.

(i) Write a C++ function to read values into the array. Your function should accept the array and its size as the parameters.

(ii) Write another function to sort the array.

(iii) Write a main program to test your function in (i) and (ii).