### EASTERN UNIVERSITY, SRI LANKA

### FIRST EXAMINATION IN SCIENCE 2001/2002

# FIRST SEMESTER (April, 2002)

## CS 103 - Introduction to Program Design and

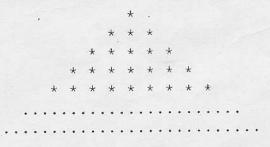
#### Programming

#### 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<sup>th</sup> 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.
  - 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).