[This question paper contains 5 printed pages.]

6460 *Your Roll No.* .....

M.Sc. (INFORMATICS) / I Sem. – 2010

Paper IT11 – PROGRAMMING METHODOLOGY

Time : 3 hours *Maximum Marks : 75*

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt **five** *questions in all.*

1. (a) Write a function that outputs a sideways triangle of height $2n - 1$ and width n, so the output for $n = 4$ would be :

```
*
**
***
****
***
**
*
```

(9)

(b) Distinguish between terms fatal error and non fatal error. Why might you prefer to exercise a fatal error than a non fatal error ? (3)

P.T.O.

(c) What is the wrong with the following statemen Rewrite the statement to accomplish what t programmer was probably trying to do.

Printf("%d", ++(x+y));

(3)

2. (a) Build a program where control passes from main to three different functions with 3 calls. Now make a while loop in main with the function calls inside it. Ask for input at the beginning of the loop. End the while loop if the user hits Q. Next add conditionals to call the functions when the user enters numbers, so 1 goes to function 1, 2 goes to function 2, etc. Have function 1 call function a, which calls function b, which calls function c. Also draw out a diagram of program flow, with arrows to indicate where control goes. (7)

(b) Compare the two approaches recursion and iteration. Discuss why you might choose one approach over the other in a particular situation. (4)

(c) With the help of problem example, explain top to down and bottom to up designing techniques. (4)

3. (a) Write a function contains(char*, char) which returns true if the 1st parameter string contains the 2nd parameter char, or false otherwise. (7)

(b) Write a function which capitalizes the first letter in every word. Assume the first letter is any letter at the beginning or preceded by a blank. All other letters should be turned into lowercase. (8)

4. (a) Give the value of the left-hand side variable in each assignment statement. Assume the lines are executed sequentially. Assume the address of the blocks array is 4434.

```
int main( )
{ char blocks[3] = {'A','B','C'};
  char*ptr = &blocks[0];
  char temp;
 temp = blocks[0];
  temp = *(blocks + 2);
  temp = *(ptr + 1);
  temp = *ptr;
 ptr = blocks + 1;
  temp = *ptr;
  temp = *(ptr + 1);
  ptr = blocks;
  temp = *++ptr;
  temp = ++*ptr;
  temp = *ptr++;
  temp = *ptr;
  return 0;
}
```

(4)

(b) When is it valid to compare the values of two pointers ? Explain with example. (2)

(c) Consider the following struct that might be used in a campus directory :

```
#define MAX 20
struct entry {
    char first[MAX];
    char last[MAX];
    char dorm[MAX];
    int phone;
};
```

Write a function comesFirst that takes two entry records as parameters and returns true if the name within the first entry comes before the name of the second. In comparing names, comesFirst initially should compare last names. If the last names are different, comesFirst should check dictionary order, ignoring capitalization. If the last names are identical, then comesFirst should compare the first names using dictionary order and ignoring capitalization. (9)

5. (a) Write a function which takes date from user in various forms (for example mm-dd-yr or mm/dd/yr) and stores month, date and year into corresponding variables). (5)

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(b) Write a program to count the number of lines and characters in a file. (8)

(c) Write a statement that reads a record from file "trans.dat". The record consists of the integer accountNum and floating point dollarAmount. (2)

6. (a) Write a program that defines and uses macro PRINT to print a string value. (8)

(b) Write a program that dynamically allocates an array of intergers. The size of array should be input from keyboard. The elements of array should be assigned input from keyboard. Print the values of the array. (5)

(c) Explain about volatile type qualifier. (2)

(100)****