MCA (Revised)

Term-End Examination

June, 2007

MCS-011 Ⓢ : PROBLEM SOLVING AND PROGRAMMING

Time : 3 hours   *Maximum Marks : 100*

(Weightage 75%)

Note :   Question number 1 is **compulsory**. Attempt any **three** questions from the rest.

1. (a)   Design an algorithm, draw a corresponding flowchart and write a program in C, to find whether a given number is a palindrome or not.   *10*

    (b)   Write an algorithm and a program in C to calculate the factorial of a given number using recursion.   *10*

    (c)   Write a program to generate the pattern given below :   *10*

    <pre>
        1
       2 3
      4 5 6
     7 8 9 10
    </pre>

(d) When can two matrices of order a × b and c × d be subtracted ? Also write a program to find the difference of two such matrices. *10*

2. (a) Write a macro to find out whether the given character is uppercase or not. *7*

(b) Write a program to read formatted data from file. *7*

(c) Explain the concept of a pointer to a pointer using an example. *6*

3. (a) Draw a flowchart and write a menu-driven program in C to perform the following : *7*

(i) Calculate square of a number if choice is 1.

(ii) Calculate cube of a number if choice is 2.

(iii) Otherwise print the number as it is.

(b) Write the usage of the following with an example of each : *3×2=6*

(i) enum

(ii) typedef

(iii) struct

(c) Write a program in C, using structures to generate a progress report for students which displays the total marks, average, percentage and corresponding division. Assumptions can be made wherever necessary. *7*

4. (a) Explain the use of gets, puts, strcmp and strrev functions with the help of examples. *8*

(b) Write a function in C to swap the values of two variables without taking any temporary variable. *6*

(c) Explain the usage of the following statements in C with an example for each : *6*

(i) Goto

(ii) Break

(iii) Continue

5. (a) Write a program in C to search an element in a given list of elements using linear search. *10*

(b) Write a loop that calculates the sum of the series : *10*

$1 + 4 + 7 + 10 + 13 + ...$

Write the loop in 3 different ways :

(i) using while loop

(ii) using do-while loop

(iii) using for loop

Also explain the algorithm for the above.