· MCA (Revised)

Term-End Examination

June, 2008

MCS-011 : PROBLEM SOLVING AND PROGRAMMING

Time : 3 hours   *Maximum Marks : 100*

(Weightage 75%)

Note :

(i)   *Question number 1 is* **compulsory.**

(ii)   *Attempt any* **three** *questions from the rest.*

1. (a) Design an algorithm, draw a corresponding flowchart and then write a program in C to convert a given string to lower case.   *10*

    (b) Write an algorithm and program in C to generate fibonacci series. Use recursion.   *10*

    (c) Draw a flowchart and write a program in C to calculate the number of vowels in a given string.   *10*

(d) What do you mean by 'array of pointers' ? Write a program in C to calculate the difference of the corresponding elements of two arrays of integers of same size. *10*

2. (a) Write the usage of the following (with an example of each) : *5*

(i) #define

(ii) enum

(b) Write a macro for the following : *7*

(i) to find the smallest number among 3 given numbers.

(ii) to find the factorial of a given number N.

(c) What are the differences between structure and union ? Give one illustrative example of usage of the union. *8*

3. (a) Write a program in C, using structures to generate a report for employees which displays the total salary, designation, department, address etc. Assumptions can be made wherever necessary. *8*

(b) Write a program to read formatted data from the file. *6*

(c) Give a brief note on null pointer assignment. Write a program in 'C' to illustrate this concept. *6*

4. (a) Write a program which reads a file and counts the number of lines and words in the file, assuming that a line can contain at most 80 characters. *8*

(b) Give differences between : *6*

   (i) Sequential and Random Access files

   (ii) Global variable and Local variable

(c) Write a program and flowchart to display the following pattern : *6*

```
 1
 2   3
 4   5   6
 7   8   9   10
11  12  13  14  15
16  17  18  19  20  21
```

5. (a) Write a program in C to find the difference between two matrices of size (3 × 3). *5*

(b) Write a program in C to sort a given list of numbers using bubble sort. Draw corresponding flowchart also. *7*

(c) Explain meaning of following prototypes and mention return data type of each of them : *8*

   (i) int (*f) (char*);

   (ii) int *f (char*);

   (iii) double f (int a, int b, char c);

   (iv) unsigned f ( );