ALCS

FEBRUARY 2009

Code: CS11   **Subject: COMPUTER PROGRAMMING &**
                                            PROBLEM SOLVING THROUGH C
Time: 3 Hours   **Max. Marks: 100**

NOTE:
- **Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.**
- **Parts of a question should be answered at the same place.**

Q.1   **(7 x 4)**

   a. Describe briefly the Top Down and Bottom-up approach of Problem Solving and programming.

   b. Write a code to add two numbers without using "+" operator.

   c. Predict the output of the following function:
```
  main()
   {
    char *p;
    printf ("%d %d ",sizeof(*p),sizeof(p));
   }
```

   d. What is the difference between char *a and char a[ ] ?

   e. Differentiate between declaration and definition of a function with the help of an example.

   f. What are bit fields? What is the use of bit fields in structure declaration?

   g. In what ways does a switch statement differ from an if statement.

Q.2   a. What is the purpose of malloc() , calloc(), realloc() and free()?   **(8)**

   b. Write a program to reverse each word of the string.
     Input string: "ram is a good boy"
     Output string: "mar si a doog yob".   **(10)**

Q.3   a. Write a program to count the number of occurrences of any two vowels in succession in a line of text. For example, in the following sentence:
     "Please read the application and give me loan"

Such occurrences are ea, ea, io, oa i.e. 4 occurrences. **(10)**

b. Write a function power (a, b), to calculate the value of a raised to power b, where b is an integer. **(8)**

Q.4 a. Write a string compare function (Apart from strcmp ()). **(6)**

b. Develop an algorithm to check whether given input number *n* is prime or not. **(8)**

c. Ten floats are to be stored in a memory. What would be preferred, an array or a structure? Justify. **(4)**

Q.5 a. Define preprocessor and directives. Give examples of directives used to control Preprocessors. **(8)**

b. Write a function to calculate sum of the digits of the 5 digit positive number:
(i) without using recursion.
(ii) using recursion. **(10)**

Q.6 a. Write a program to pick up the largest number from any 5 row by 5 column matrix. **(8)**

b. Write a function to print all of the permutations of a string. For example if input is ABC, output should be
ABC, ACB, BAC, BCA, CAB, CBA. **(10)**

Q.7 a. Write short notes on (Any **THREE**):

    i.   Linkers and loaders.
    ii.   Structure and Union.
    iii. Black Box Testing.
    iv. File handling in C. **(6+6+6)**