USN ☐☐☐☐☐☐☐☐☐☐ **13MCA11**

First Semester MCA Degree Examination, Dec.2014/Jan.2015
Problem Solving Using C

Time: 3 hrs. Max. Marks:100

Note: *Answer any FIVE full questions.*

1 a. What do you mean by storage class? What are the different storage classes used in C programming language? Explain with the help of an example. **(08 Marks)**
  b. Explain hierarchy of operation for an arithmetic statement. Determine the hierarchy of operations and evaluate the following expression stepwise.
  i = 2 * 3/4 + 4/4 + 8-2 + 5/8. **(05 Marks)**
  c. If the three sides of a triangle are entered through the keyboard, write a program to check whether the triangle is equilateral or right angled triangle. **(07 Marks)**

2 a. What are the limitations of scanf( ) function in receiving string of characters? Which alternate function is used to overcome this limitation? Explain with an example. **(04 Marks)**
  b. Explain odd loop using a for loop and using a while loop. **(07 Marks)**
  c. The natural logarithm can be approximated by the following series:

$$\frac{x-1}{x}+\frac{1}{2}\left(\frac{x-1}{x}\right)^2+\frac{1}{2}\left(\frac{x-1}{x}\right)^3+\frac{1}{2}\left(\frac{x-1}{x}\right)^4+\ldots\ldots$$

  If x is input through the keyboard, write a program to calculate the sum of first seven terms of the series. **(09 Marks)**

3 a. What do you mean by an array? Write a program to demonstrate passing array elements to a function. **(06 Marks)**
  b. Write a program of matrix multiplication. **(08 Marks)**
  c. Explain the case control structure with the help of an example. **(06 Marks)**

4 a. What is pointer? Explain pointer notation with the help of an example. **(04 Marks)**
  b. Write a program to sort a set of names stored in an array in alphabetical order? **(08 Marks)**
  c. What is the limitation of array of pointers to strings? Write solution with an example. **(08 Marks)**

5 a. What is the purpose of function in C programming? Write a program using function that receives 5 integers and returns the sum, average and standard deviation of these numbers. Call this function from main( ) and print the result in main( ). **(08 Marks)**
  b. Make a comparison on call by value and call by reference. **(04 Marks)**
  c. Write a recursive function to obtain the first 25 numbers of a Fibonacci series. In a Fibonacci series the sum of two successive terms gives the third term. Following are the first few terms of the Fibonacci series: 1 1 2 3 5 8 13 21 34 55 89. **(08 Marks)**

6 a. What do you mean by structure? How structure elements are stored? Explain with the help of an example. **(04 Marks)**

b. Write a program to create an array of structures named "STUDENT" with field name, USN and percentage of marks. Read the data pertaining to 'n' students and list the names of students whose percentage marks is greater than or equal to 85%. **(10 Marks)**

c. Write a C program to calculate area of circle using macros with arguments. **(06 Marks)**

7 a. What are the different modes to open file? Write the tasks performed by fopen( ) when a file is opened in each of these different modes. **(07 Marks)**

b. What is the purpose of the library function fflush( )? Explain. **(03 Marks)**

c. Write a program to copy the content of one file to another. While doing so, replace all lower case characters to their equivalent upper case characters. **(10 Marks)**

8 Write short notes on:

a. typedef.

b. Bitwise operators.

c. Macro versus functions.

d. malloc and calloc. **(20 Marks)**

* * * * *