## First Semester MCA Degree Examination, June/July 2017
## Problem Solving using C

Time: 3 hrs.  Max. Marks:100

**Note: *Answer any FIVE full questions.***

1  a. What is an algorithm? What are its characteristics? **(06 Marks)**
   b. What are the different storage classes available in C? **(08 Marks)**
   c. Explain different categories of operators in C. **(06 Marks)**

2  a. With syntax and example, explain the concept of switch statement. **(06 Marks)**
   b. Explain different loop control structures available in C with proper syntax. **(06 Marks)**
   c. Write C program to find the sum of the individual digits of a given integer number. **(08 Marks)**

3  a. What are arrays? Explain the different ways of declaration and initialization of arrays. **(06 Marks)**
   b. Write a C program to accept two matrices. A(M×N) and B(P×Q) and find their product. **(10 Marks)**
   c. Explain the relationship between array and base pointer. **(04 Marks)**

4  a. Write a user defined function named 'mycat' to concatenate two strings passed as parameters to 'mycat' function. **(05 Marks)**
   b. What is a function? Explain two methods of calling function for the example of swapping 2 Nos. **(06 Marks)**
   c. What is a recursion? Write recursive program to find factorial of a number. **(05 Marks)**
   d. What is a pointer? Can we return a pointer from a function? Justify your answer with simple example. **(04 Marks)**

5  a. Explain the following string functions with proper syntax:
      (i) strcat( )    (ii) strcpy    (iii) strlen( ) **(06 Marks)**
   b. Define and differentiate structure and union with example and memory diagram. **(04 Marks)**
   c. Write a C program to create an array of STRUCTURE named "STUDENT" with fields NAME, ID, and TOTAL_MARKS. Read data pertaining to 'n' students and list the names of the students whose total marks is greater than or equal to 85. **(10 Marks)**

6  a. Write a program to implement "isPalindrome( )" function to check string is palindrome or not without using built-in function. **(10 Marks)**
   b. Write a program to print prime numbers between integers m and n (m < n). **(06 Marks)**
   c. What are files? What are different input, output modes in opening a file? **(04 Marks)**

7  a. What is DMA? Explain different DMA functions with syntax. **(10 Marks)**
   b. What are preprocessor directive? Mention and explain the categories of directives with example. **(10 Marks)**

8  Write short notes on the following :
   a. Conditional control structures
   b. Type casting and type conversion
   c. Types of function
   d. Bit fields **(20 Marks)**

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