

MCA (Revised)**Term-End Examination****December, 2008****MCS-011 : PROBLEM SOLVING AND
PROGRAMMING***Time : 3 hours**Maximum Marks : 100**(Weightage 75%)*

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

1. (a) Design an algorithm, draw a corresponding flow chart and write a program in 'C', to find the factorial of a given number using recursion. 10
- (b) Write a 'C' program to find whether a given five digits number is a palindrome. 10
- (c) Write a program in 'C' to find all Armstrong numbers in the range of 0 and 999. 10
- Hint :** An Armstrong number is an integer such that sum of the cubes of its digits is equal to the number itself, e.g. : 153 is Armstrong number.
- (d) When can two matrices of order $m \times n$ and $p \times q$ be multiplied ? Also write a program in 'C' to multiply two such matrices. 10

2. (a) Write a program in 'C' to generate a progress report for students which displays the total marks, average, and grades. The input for the system are marks secured in five courses (Assignment and Term end Examination). Pass (40%) in both the components are compulsory. Grades may be given accordingly. Assumptions can be made if necessary and specify them. 10
- (b) What is the difference between "&" and "&&" ? Explain with an example. 5
- (c) Write a loop that calculate sum of the n elements of the series : 5
- $1 + 7 + 13 + 19 + 25 + \dots$
- Write the loop in 3 different ways :
- (i) using while loop
- (ii) using do-while loop
3. (a) Write a macro to find out whether the given character is lower case or not. 7
- (b) Write a program in 'C' to check whether the given year is leap or not. Also explain the logic of the program. 8
- (c) Write a function definition to find the smallest among the given three numbers. 5

4. (a) Without using the 'strcpy' function, write a program to copy contents of string 2 to string 1, and find the length of the copied string using pointers. 10
- (b) Write the usage of the following data types, with an example for each : 10
- (i) enumerated data type.
 - (ii) typedef.
5. (a) Design an algorithm and draw corresponding flow chart to convert a decimal number to its Hexadecimal equivalent. 10
- (b) Explain the following storage class specifiers of a variable in terms of default value, lifetime, scope purpose and limitations (with an example) 10
- (i) Auto
 - (ii) Register

