

MCA (Revised)

Term-End Examination

December, 2013

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) Explain comma and conditional operator in C language with examples. 6
- (b) Write an algorithm to calculate the factorial of a given number. 5
- (c) Write a program to add 2 matrices A and B of order 3×3 . 6
- (d) Name different categories of constants in C language. 3
- (e) Write a program segment to generate the following pattern using *for* loop and *while* loop. 6
- ```

1
1 2
1 2 3
1 2 3 4

```

- (f) Explain the concept of Top Down Design Technique. 4
- (g) Give the C expression for following algebraic expression 6
- (i) 
$$\frac{(a + b)^4 c^2 - d \times e}{m + n}$$
- (ii) 
$$ab + (e - f)^4 / (c \times d)$$
- (h) What is a runtime error ? Explain with an example. 4
2. (a) What is an union ? Explain how a union is declared in C. Explain with an example how members of a union are accessed. Also, state the difference between an union and a structure. 10
- (b) Explain syntax of Array declaration write a C program in C to multiply two matrices of  $3 \times 3$  using arrays. 10
3. (a) Differentiate between macros and functions. Explain a situation when macro should be preferred over function. 4

- (b) Write a macro to the display string INDIA 6  
in following pattern :

I  
IN  
IND  
INDI  
INDIA  
INDI  
IND  
IN  
I

- (c) What is a string ? Write a function in C to 10  
find a string length without using `strlen()`.
4. (a) What are array of pointers ? How they are 10  
declared and initialised ? Using pointers  
write a program to read and display list of  
names of students.
- (b) What is the purpose of using header files in 10  
C. Explain functions that are used in C for  
reading and writing of characters. Also,  
explain string input and output function in  
C.
5. (a) Explain shift operators with examples. 4  
(b) Explain Random and Sequential Access 4  
Files.
- (c) Explain the use of following functions 6x2=12  
in C :
- (i) `malloc()` (ii) `fopen()`  
(iii) `fgets()` (iv) `strcat()`  
(v) `fputc()` (vi) `fclose()`