PG – 850

I Semester M.C.A. (Two Years Course) Examination, Aug./Sept. 2021
(CBCS) (2020-2021 and Onwards)
COMPUTER SCIENCE
1MCA 1 : The Art of Programming

Time : 3 Hours Max. Marks : 70

PART – A

Note : Answer **any five**. **Each** question carries **six** marks : **(5×6=30)**

1. What is complexity of an algorithm ? What is the best case, worst case and average case complexity ?
2. Write an algorithm to generate fibonacci series upto the number n.
3. Write an algorithm to reverse the digits of an integer. Check your algorithm for the input 1234.
4. What is the advantage of Binary search ? Write the binary search algorithm.
5. Write a note on control structures in C high level language.
6. How are matrices stored using row major representation ? Represent the following matrix using row-major order.

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \\ 10 & 11 & 12 \end{bmatrix}_{4\times3}.$$

How does the compiler find the location of a_{ij} th element ?

7. What is pass by value and pass by reference ? Explain with suitable example.
8. What is a structure ? Write a structure for the members : name, gender and salary. How are the members of the structure accessed in C high level language ?

P.T.O.

PART – B

Note : Answer **any four**. **Each** question carries **10** marks : **(4×10=40)**

9. What is 2-way merge sort algorithm ? Given the following two sets, merge the elements using 2-way merge sort

   List 1 : 3 4 6 9 11 14 23

   List 2 : 1 2 5 7 8 13 17 19

10. Write selection sort algorithm. Sort the following number using selection sort :

    7 1 4 3 9 2 0 8

    show the numbers after each pass.

11. Write an algorithm to multiply two matrices.

12. Write an algorithm to remove duplicates from a given list. Trace your algorithm for the following list :

    1 2 2 4 5 6 7 7 8 9 9 9

13. Write an algorithm to find a sub text in a given text. What is pattern searching ? How do you search for a key word in a given text ?

14. Write a C program to find the maximum number in a given list. Trace your algorithm for the following list :

    {4, 6, 3, 2, 9, 8, 13, 5}