JP – 763

I Semester M.C.A. (Two Years Course) Examination, July 2023
(CBCS Scheme)
(2020 – 2021 and Onwards)
1MCA1 : THE ART OF PROGRAMMING

Time : 3 Hours | Max. Marks : 70

PART – A (5×6=30)

Answer **any five** of the following :

1. What is an algorithm ? What is complexity of an algorithm ? Define Big Oh notation.
2. Write an algorithm to find fibonacci series upto n.
3. Write an efficient algorithm to find GCD of two numbers. Find GCD of (12, 5) and (54, 42).
4. Given a 'for' control structure and 'while' control structure which one do you use ? Explain your answer for reversing a number.
5. Write an algorithm to sort numbers using selection sort. Trace your algorithm to sort the following list of elements.
   {6, 3, 9, 8, 4, 5, 0, 1, 2, 7}.
6. Write an algorithm to find square root of a number.
7. What is the difference between a structure and a union ? Declare a structure for an organization with 100 employees. The employees name, age, identity-number may be stored.
8. What is hashing ? When does collission happen ? Given the following elements, store the elements in a hash table of size 10 : (use any of the hash function and collission handling algorithm).
   {6, 3, 13, 24, 36, 12, 4, 9}.

PART – B (4×10=40)

Answer **any four** of the following :

9. What is call by value, and call by reference ? Give an example. What is a recursion ?
10. By partitioning the set, sort the following elements.
    {4, 0, 9, 6, 8, 2, 7, 1, 5, 3}.
    Write merge-sort algorithm.

P.T.O.

11. a) Write an algorithm to generate Pseudo random number. 5

    b) Write an algorithm to convert base 10 number to base 8 number. 5

12. Write an efficient algorithm to find a^n where n is a large number.

13. Write an algorithm to remove duplicates in an array. Trace your algorithm for the following :
    {13, 14, 14, 15, 15, 15, 16, 17, 18, 18, 19}.

14. Write a short note on the following :

    a) Two-way merging. 5

    b) Pattern matching algorithm. 5