PG – 665

I Semester M.C.A. (Two Years Course) Examination, May/June 2026
(CBCS) (2020 – 2021 and Onwards)
COMPUTER SCIENCE
1MCA1 : The Art of Computer Programming

Time : 3 Hours Max. Marks : 70

Instruction : *Answer* ***any five*** *from Part – **A** and answer* ***any four*** *from Part – **B**.*

PART – A

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

1. What are the essential and desirable properties of an algorithm ? **6**

2. Distinguish between theoretical and practical analysis of algorithms. What are the standard functions that are used for algorithms efficiency analysis ? **6**

3. Write the recurrence relation for finding the sum of the digits of an integer. Produce the recursive procedure for the problem of computing the sum of the digits of an integer. **6**

4. Differentiate between else-if ladder and switch statement with an example each for their usage. **6**

5. Write an algorithm to compute gcd of two non-negative, not both-zero integers. Trace it for the integers (12, 10). **6**

6. Write a C program to search for a name in a list of names using linear search. **6**

7. Present selection sort algorithm trace it for the following list (5, 7, 3, 2, 4, 8, 6). **6**

8. How are variable number of arguments for a function dealt with in a C program ? Illustrate. **6**

P.T.O.

PART – B

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

9. a) Write an algorithm to convert from decimal integer to its binary equivalent. **5**

   b) Present the procedure to convert a string of digits into its decimal integer equivalent. **5**

10. a) Produce both iterative and recursive algorithms to find the value of x to the power of y. **5**

    b) How do you find the kth largest element in a list of integers ? Formulate the procedure. **5**

11. a) Give an account of the relationship between arrays and pointers in C. Consider the cases of both 1-d arrays and 2-d arrays. **5**

    b) Write a C program to search for a string in a list of strings and also find its frequency of occurance. **5**

12. a) Develop an algorithm to find whether a square matrix is a lower triangular matrix or an upper triangular matrix. **5**

    b) Write the algorithm to multiply two matrices and implement it in C. **5**

13. a) Produce binary search algorithm. **5**

    b) Write C program to search for a name in a sorted list of names. **5**

14. Write notes on :

    a) Merging of two sorted lists of integers. **4**

    b) Open Hashing. **3**

    c) Command line arguments. **3**