

**FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2021
(Regular/Improvement/Supplementary)**

**COMPUTER SCIENCE
FCSS1C02 – ADVANCED DATA STRUCTURES**

Time: 3 Hours

Maximum Weightage: 30

Section A: Short answer questions. Answer any *four* questions. Each carries *two* weightage.

1. Define Algorithm. Explain the algorithm design techniques.
2. Explain Priority Queue with algorithm.
3. Explain the working of Binary Search Algorithm.
4. Convert the following expression into prefix and postfix form.

i) $a-(b+c)*d/f$

ii) Evaluate the Post fix expression using Stack: $abc+d*f/-$

where $a= 6, b= 3, c= 6, d= 5, f= 9$

5. What is sorting? Explain Bubble sort.
6. Explain Splay Trees.
7. Explain Warshall's Algorithm to compute the path matrix of a graph.

(4 × 2 = 8 weightage)

Section B: Short essay questions. Answer any *four* questions. Each carries *three* weightage.

8. Explain the Applications of Stack with example and algorithm/program.
9. What are DFS and BFS? Differentiate the two methods of traversing of a graph with suitable example.
10. Briefly explain the linked list and its types with algorithm and implementation.
11. Explain the Sparse Matrix Representation and Garbage Collection.
12. What is collision? Explain the two types of collision resolution techniques.
13. What is heap data Structure? Explain Min- Max Heap.
14. Write a C program to implement Stack operations using Array/Linked List.

(4 × 3 = 12 weightage)

(P.T.O.)

Section C: Essay questions. Answer any *two* questions. Each carries *five* weightage.

15. Explain the different operations on Stack and Queue with Algorithm.
16. Explain Binary Search Tree. How will you Search and insert a node in BST. Explain the concept with algorithm and suitable examples.
17. What is probing? Explain the process of examining the slots in the hash table to find out the location by using different open addressing methods.
18. Explain the following.
 - i) Algorithm
 - ii) Quick Sort
 - iii) Deap and Binomial Heap
 - iv) Minimum Spanning Trees
 - v) Circular Queue
 - vi) Operations on Data Structure

(2 × 5 = 10 weightage)