FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2023
(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.   Explain the classification of various data types in data structure.

2.   List out the operations that are typically defined for integer data type other than arithmetic operations.

3.   Differentiate between linear probing and quadratic probing.

4.   Convert the infix expression (A*B+C/D-F)/(A-B+C/D) into postfix expression.

5.   Describe Big 'O' notation used in algorithm analysis.

6.   What are splay trees?

7.   Store the following values in a hash table of size 7 using division method. Use chaining as the method of collision resolution.

     25   43   95   107   161   197

                                                    (4 × 2 = 8 weightage)

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

8.   Explain how to measure the quality of an algorithm.

9.   What are the applications of heap tree?

10.   Describe the insertion operation in B tree with example.

11.   Explain the concept of hashing and rehashing.

12.   Discuss any three sorting algorithms.

13.   Give an account on Huffman algorithm for extended binary tree.

14.   What is a binary search tree (BST)? Make BST for the following.

      46, 35, 77, 22, 88, 117, 37, 42, 54, 68, 49.

      Traverse the tree in pre order, in order and post order.

                                                    (4 × 3 = 12 weightage)

                                                    (P.T.O.)

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

15. What are doubly linked list? Write down the procedure to perform the following operations on a Singly linked list.

    a) Insertion at the beginning.

    b) Deletion at a given position.

    c) Deletion at beginning.

    d) Insertion at the end.

16. Explain various collision resolution strategies with example.

17. Illustrating examples. Explain different graph traversal techniques.

18. Describe any five heap structures in data structure with examples.

(2 × 5 = 10 weightage)