CCMTE/D-23   24056

ADVANCED DATA STRUCTURES

MT-CSE-20-12

(CBCS)

Time : Three Hours]   [Maximum Marks : 75

Note : Attempt *Five* questions in all. Question No. **1** is compulsory. In addition to compulsory question, attempt *four* more questions, selecting exactly *one* question from each Unit. All questions carry equal marks.

(Compulsory Question)

1. (a) What is meant by abstract data type ?

(b) Define Red-Black tree.

(c) State the limitations of Brute-Force pattern matching algorithm.

(d) What is a suffix trie ?

(e) Comment on the need of computations geometry.

(f) Define priority search tree.   **6×2.5=15**

Unit I

2. What is collision handling in hashing ? Explain any *three* ways of handling collision in hashing using suitable examples. **15**

3. Comment on the need of dictionaries. How can you implement dictionaries ? Explain in detail. **15**

Unit II

4. What is a splay tree ? How can you insert, delete and search an element in a splay tree ? Explain in detail along with analysis of splay tree. **15**

5. Explain search and update operation in a skip list by writing algorithms and suitable examples. Discuss the probabilistic analysis of skip list. **15**

Unit III

6. Write and explain the KMP algorithm for pattern matching. Explain using suitable examples along with its analysis in detail. **15**

7. What is Dynamic Programming ? How can you solve a problem using dynamic programing ? Explain using an example of LCS problem. **15**

Unit IV

8. What is two dimensional range searching ? Explain in detail by writing algorithm and using suitable example. Also analyze the algorithm in terms of time and space. **15**

9. How can you perform the searching in a priority search tree and *k-d* tree ? Explain in detail. **15**