Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 30116

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Third Semester

Computer Science and Engineering

CS 3301 – DATA STRUCTURES

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the uses of Abstract Data Type (ADT).

2. List the advantages of doubly linked list.

3. Give the limitations of linear queue.

4. Write the underflow and overflow conditions in stack?

5. Mention the types of rotations performed on AVL tree.

6. State the properties of binary search tree.

7. Define critical path.

8. State the uses of topological sort.

9. Outline perfect minimal hashing function.

10. Identify the principle behind the external sorting algorithms.

PART B — (5 × 13 = 65 marks)

11. (a) Explain how list operations can be implemented using Arrays.

Or

(b) Explain how polynomial expression can be represented using linked list.

12. (a) Write an algorithm for Push and Pop operations on Stack using Linked list.

Or

(b) Explain the addition and deletion operations performed on a circular queue with necessary algorithms.

13. (a) Identify the types of Priority Queue. Explain about min heap insertion and deletion operations.

Or

(b) Explain Heap tree ADT in detail.

14. (a) Write and explain the prim's algorithm and depth first search algorithm.

Or

(b) Explain about B+ trees with algorithms to insert a node into a B+ tree.

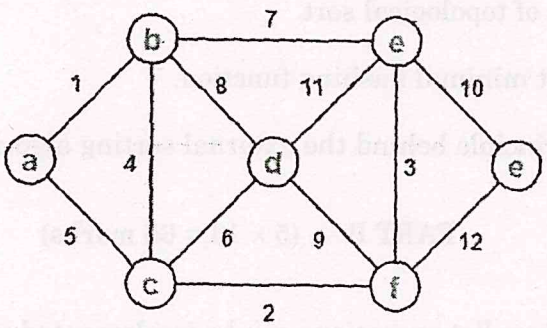
15. (a) Write an algorithm to implement Bubble sort with suitable example.

Or

(b) Discuss the common collision resolution strategies used in closed hashing system.

PART C — (1 × 15 = 15 marks)

16. (a) The keys 12,18,13,2,3,23,5, and 15 are inserted into an initially empty hash table of length 10 using linear probing with hash function h (k) = k mod 10. What is the resultant hash table?

Or

(b) Using Prim's Algorithm, find the cost of minimum spanning tree (MST) of the given graph.