

PART B — (5 × 16 = 80 marks)

11. (a) Explain the Top-down design and implementation with example.

Or

- (b) Assuming a sample algorithm analyse its efficiency in detail.

12. (a) (i) Describe List ADT. Using List ADT, explain the implementation of Stack ADT. (12)

- (ii) What is the advantage of using list than array while implementing stack? (4)

Or

- (b) (i) Design algorithms for various operations performed on circular linked list. (8)

- (ii) Extend the algorithms defined in the previous question for the doubly linked circular list. (8)

13. (a) (i) Explain the four rotations performed on an AVL tree. (8)

- (ii) Describe an algorithm for insertion of a key value into an AVL tree. (8)

Or

- (b) What are the various collision resolution strategies in Hashing? Explain each one of them, and illustrate with examples.

14. (a) (i) Describe using an algorithm, how a pivot element be fixed in the appropriate position in the quick sort method? (8)

- (ii) Derive the worst case behaviour of quick sort technique. (8)

Or

- (b) (i) What is the need for external sorting? (4)

- (ii) Explain any one of the method to perform external sorting. (12)

15. (a) Explain single source shortest path and all pair shortest, path problems with required algorithms and their complexities.

Or

- (b) Explain with algorithm, how DFS be performed on an undirected graph. Then, show the algorithm for finding connected components of an undirected graph using DFS, and derive the time complexity of the algorithm.

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