BCA/M-20   **1893**
ADVANCED DATA STRUCTURE
BCA-241

Time : Three Hours]   [Maximum Marks : 80

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

(Compulsory Question)

1. (a) Define root, terminal nodes, non-terminal nodes and empty tree.   **4**

(b) Define a shortest path of a weighted graph. **3**

(c) Sort the alphabets B, I, N, A, R, Y, S, E, A, R, C, H in ascending order using bubble sort method. **3**

(d) What are fixed length and variable length records of a file ?   **3**

(e) Develop an inorder recursive tree traversal algorithm.

3

Unit I

2. Develop algorithm for a binary tree :
    (a) to create a binary tree.   **6**
    (b) to add a node in it.   **5**
    (c) to exchange left and right subtree.   **5**

3. (a) Develop a postorder tree traversal algorithm to traverse a binary tree using a stack data structure. **8**
    (b) Write Hoffman's algorithm to create an extended binary tree for the set of weights {2, 4, 6, 7, 9, 10}.

                                                                     8

Unit II

4. A graph is given below : Write its :
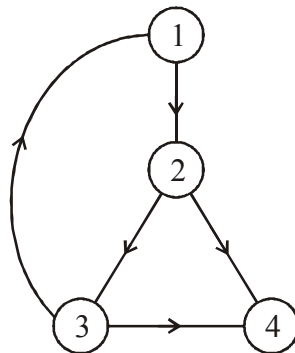
    (a) Adjancy matrix   **5**
    (b) Adjancy linked list   **5**
    (c) Multilist representation.   **6**

5. (a) Discuss breadth first search (BFS) algorithm for traversing a graph. **8**

(b) Develop Warshall's algorithm for determining shortest path of a graph. **8**

Unit III

6. (a) Discuss best, average and worst case complexity of linear search method. **8**

(b) Discuss internal and external sorting and their respective application areas. **8**

7. Develop algorithm for :
(a) Heap Sort **8**
(b) Radix Sort. **8**

Unit IV

8. Write notes with example of each : **16**
(a) Hash function
(b) Chaining
(c) Buckets
(d) Collisions.

9. Discuss organisation, storage devices, access method and deletion of a record in a random file organisation. **4×4**