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1938

BCA / M-19

ADVANCE DATA STRUCTURE

Paper–BCA-241

Time allowed : 3 hours] *[Maximum marks : 80*

*Note :- Attempt **five** questions in all, selecting **one** question from each unit. **Question No. 1 is compulsory.** All questions carry equal marks.*

1. Compulsory question:

(a) Differentiate a strict binary tree and a complete binary tree. 3

(b) Elaborate a binary search in Faster but occupies more space in memory. 3

(c) Arrange the following alphabets A, R, C, H, I, T, E, C, T, U, R, E in ascending order using selection sort. 3

(d) Write factors for selecting storage device for a sequential file organisation. 3

(e) Discuss representation of Graph G (V, E), V set of vertices and E set of edges in memory using linked list representation. 4

Unit–I

2. (a) Define a binary tree and develop algorithm to copy a binary tree in to another binary tree. 8

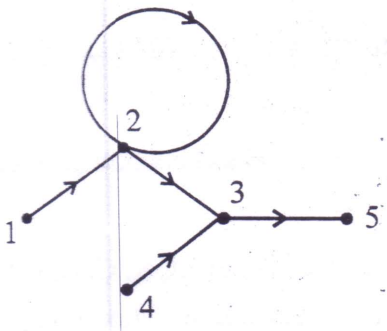
(b) How a tree is represented in memory as a sequential representation and its advantages and limitations. 8

3. (a) Develop Huffman's algorithm to build an extened binary tree for a set of weights {1, 3, 3, 5, 6, 8}. 8

   (b) Develop an algorithm to traverse a binary tree in inorder using stacks structure. 8

Unit–II

4. Let a directed graph given below as:



   Write:

   (a) Adjancy matrix. 5

   (b) Adjancy link list. 5

   (c) Multilist representation. 6

5. (a) Develop Dijkastra's algorithm for shortest path in a directed graph G (V, E) where V = set of vertices and E = set of edges. 8

   (b) What is depth first search (DFS) in a graph? Develop an algorithm for DFS. 8

Unit–III

6. (a) Explain linear search algorithm for searching an Item in a group. Discuss time and space complexity of linear search. 8

   (b) Develop algorithm for quick sort as a recursive method. 8

7. (a) What is external sorting? How it is performed? 8

   (b) Elaborate merge sort and show that its complexity function f(n) (comparisions) < O (n). 8

Unit–IV

8. Explain with example of each:

   (a) Hash Table

   (b) Mid square method hashing function.

   (c) Rehashing

   (d) Open addressing 4×4

9. Discuss organisation, storage device, insertion and deletion handling in a sequential file organisation. 4×4