

Printed Pages : 3

EEC012(EC)

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2482

Roll No.

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B.Tech.

(SEMESTER-VI) THEORY EXAMINATION, 2012-13

DATA STRUCTURES*Time : 2 Hours]**[Total Marks : 50***SECTION – A**

1. Attempt **all** question parts : **2 × 5 = 10**
- What is an external sort Algorithm ? What is Hashing ?
 - How graphs can be represented in computer memory ?
 - Define a Binary Search Tree (BST) & NP-complete problem.
 - Differentiate between iteration and recursion.
 - Define the MST of an undirected graph. List the applications of queues.

SECTION – B

2. Attempt any **three** question parts : **5 × 3 = 15**
- What is the Stack ADT ? Give any one implementation of Stack and explain clearly the data structure and routines used.
 - How a queue does works ? Explain the algorithm for inserting and deleting from a Queue.
 - Write down the complete QUICKSORT algorithm and illustrate its working to sort the list (45, 23, 11, 35, 62, 87, 24, 66).
 - Draw the AVL tree for the following sequence of insertion :
14, 10, 17, 12, 11, 20, 18, 25, 8, 22, 23, 66, 50
 - Define B-tree of order m. Build a tree by inserting records with the following key sequence F, S, Q, K, C, L, H, T, V, W, M, R, N, P, A, B of order = 4.

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SECTION – C

Attempt **all** questions.

5 × 5 = 25

3. Attempt any **one** part :

5 × 1 = 5

- (a) Write an Algorithm to implement the push, pop and display option of the stack.
- (b) Write an Algorithm to sort an array in an ascending order.

4. Attempt any **one** part :

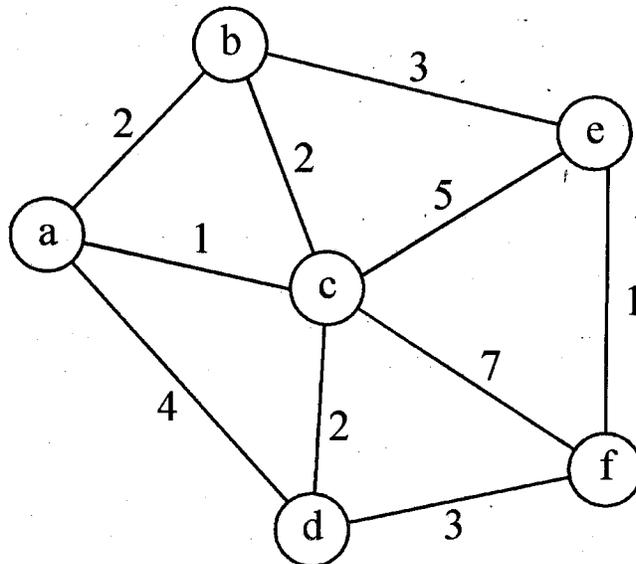
5 × 1 = 5

- (a) What is doubly linked list ? Explain the algorithm in detail for inserting a node to the left and deleting a node from a doubly linked list.
- (b) Write an algorithm and explain how insertions and deletions are carried out in a circular queue implemented using linked list.

5. Attempt any **one** part :

5 × 1 = 5

- (a) Give recursive function for Inorder, Preorder and Postorder traversal of a binary tree.
- (b) Find the shortest path using Dijkstra’s algorithm for the following weighted graph from node a to node e. Explain the steps.



6. Attempt any one part :

5 × 1 = 5

- (a) Describe the various hash function. What is a hash function ? What should be the characteristics of a good hash function ?
- (b) Demonstrate the insertion of keys 28, 5, 19, 15, 33, 12, 17, 77, 20 into a hash table with 9 slots and collision resolved by separate chaining. Let the hash function be $h(k) = k \text{ mod } 9$.

7. Attempt any one part :

5 × 1 = 5

- (a) Compare any three sorting technique with respect to algorithm complexity. Give an algorithm for QUICK sort technique for EVEN number of elements in the series.
 - (b) Differentiate between the B+ tree index files and B tree index files with example.
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