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B.E. (Computer Science Engineering) Fourth Semester (C.B.S.)

Data Structure & Program Design

P. Pages : 2 **NRT/KS/19/3379**

Time : Three Hours * 0 6 4 3 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.

1. a) Explain how to analyze an algorithm. **7**

b) Explain Asymptotic notations in brief. **6**

OR

2. a) Sort following array element using insertion sort also explain time complexity. **7**
80, 27, 42, 14, 69, 22, 85.

b) Explain data structure in brief. **6**

3. a) Write a procedure to check whether two linked list are equal or not **8**

b) Write insertion and deletion procedure of linked list. **6**

OR

4. a) Explain linked list and its type. **6**

b) Give suitable representation for polynomial and write an algorithm to add two polynomial. **8**

5. a) Explain stack with PUSH & POP operation. **7**

b) Write short notes on **6**
i) Multiple stack
ii) Priority queue

OR

6. a) Explain queue in brief. **6**

b) Explain procedure to insert element in circular queue. **7**

7. a) Explain traversal techniques of tree. **6**

b) Explain Binary Search tree? Construct a BST for the following data. **8**
43, 49, 69, 20, 33, 31, 2, 1, 5, 7

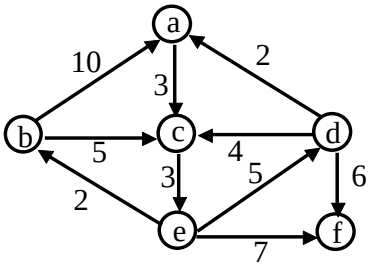
OR

8. a) Write a short note on threaded binary tree. **6**

b) Write a procedure to count no. of leaf node in a binary tree. **8**

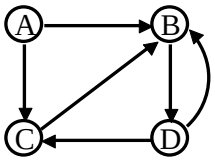
9. a) Write an algorithm for depth first search and breadth first search traversal of a graph. **6**

b) How many minimum spanning tree does the following graph have? Draw them. **7**



OR

10. a) For the following directed graph, write: **6**
i) Indegree & outdegree of each vertex.
ii) Adjacency list
iii) Adjacency matrix



b) Write a procedure to find out minimum cost spanning tree using prims algorithm. **7**

11. a) Explain any two collision handling mechanism with suitable example. **7**

b) Using Division method of hash for a table size II, store the following no. in a hash table. **6**
64, 98, 123, 200, 214, 193, 163, 201

OR

12. a) Explain any two hashing methods with proper example. **6**

b) Give the following list of elements 22, 26, 89, 45, 12, 32, 90, 55, 69, 96 and the hash function: (Index = key %10). Show the hash table. Use Collision Resolution through Linear probing. **7**

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High expectations are the key to everything.

~ Sam Walton