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Question Paper Code : 21375

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Third Semester

Computer Science and Engineering

CS 2201/CS 33/080230007/10144 CS 302 — DATA STRUCTURES

(Regulations 2008/2010)

(Common to 10144 CS 302 — Data Structures for B.E (Part-Time) Second Semester
CSE – Regulations 2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define ADT.
2. Write a C routine to deallocate the entire linked list.
3. What is a threaded binary tree?
4. List few applications of trees.
5. Simulate the result of inserting 3,1,4,6,2,8,9 into an initially empty AVL Tree.
6. How do you calculate the depth of a B-Tree?
7. Define the approach Union-By-Size.
8. State the advantages of collision resolution strategies.
9. Differentiate strongly connected and weakly connected graph.
10. What is Biconnectivity?

PART B — (5 × 16 = 80 marks)

11. (a) Explain the insertion deletion and traversal operations in a circularly doubly linked list with suitable ADT's and examples. (16)

Or

- (b) (i) Write ADT operations for a linear queue using array implementation. (8)
(ii) Write functions to multiply two polynomials using linked list implementation. (8)

12. (a) Write a C program to visit the binary tree using various tree traversals. (16)

Or

- (b) (i) Simulate a dictionary consisting of terminologies and their meanings (Key/Value pairs) with suitable search operations using binary search tree. (10)
(ii) Explain Huffman coding with a suitable example. (6)

13. (a) Explain insertion and deletion operations of B — Tree with simulate Abstract data types. (16)

Or

- (b) (i) Explain how deletion can take place in AVL trees with suitable algorithms. (8)
(ii) Write a suitable operations for percolate up and percolate down operations in a binary heap. (8)

14. (a) Give input {4371, 1323, 6173, 4199, 4344, 9679, 1989} and a hash function $h(x) = x \bmod 10$, show the resulting

- (i) Open addressing hash table using linear probing (6)
(ii) Open addressing hash table using quadratic probing (6)
(iii) Open addressing hash table with second hash function. (4)

$$h(2(x) - 7 - (X \bmod 7))$$

Or

- (b) (i) Write the necessary algorithms required for union operation in disjoint set. (8)
(ii) Explain the process of path compression in detail. (8)

15. (a) (i) Write a C program to implement topological sort. (6)
(ii) Explain minimum cost spanning Tree of graphs using Kruskals algorithm with suitable examples and ADT. (10)

Or

- (b) Explain the depth first approach of finding articulation points in a connected graph with necessary algorithms. (16)
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