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Question Paper Code: 31232

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Third Semester

Computer Science and Engineering

01UCS302 - DATA STRUCTURES

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. What are the objectives of studying data structures?
2. Differentiate: Linear data structures and Non-Linear data structures.
3. What are the various tasks performed while traversing a binary tree?
4. What is the use of threaded binary tree?
5. Define: AVL Tree.
6. Mention the applications of B-tree.
7. List out the collision resolution methods.
8. What is the need for path compression?
9. Define the term: biconnectivity.
10. What is meant by Minimum Spanning Tree?

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Write an algorithm for converting infix expression to postfix expression. Illustrate with the example: $((A+B)*D)\uparrow(E-F)$. (8)

- (ii) Write routines for inserting and deleting elements from a queue. Check for the conditions Q-empty and Q-Full. (8)

Or

- (b) (i) Discuss about various applications of stack. (6)
- (ii) What do you mean by doubly linked list? Write an algorithm for inserting and deleting an element from doubly linked list. Illustrate with example. (10)
12. (a) (i) Explain about the representing lists as binary trees. Write an algorithm to find k^{th} element and deleting it. (10)
- (ii) Write a function to perform delete the minimum element from a binary heap. (6)

Or

- (b) Write an algorithm to insert an item into a binary search tree and trace the algorithm with the items : 6, 2, 8, 1, 4, 3, 5. (16)
13. (a) Write a procedure to implement single and double rotations while inserting nodes in an AVL tree with example. (16)

Or

- (b) Describe in detail about the binary heaps. Construct a min heap tree for the following: 5, 2, 6, 7, 1, 3, 8, 9, 4. (16)
14. (a) Explain in detail the path compression techniques. (16)

Or

- (b) (i) What is meant by open addressing hashing and closed addressing hashing? Discuss the common collision resolution strategies used in closed hashing system. (10)
- (ii) Explain about smart union algorithms in detail. (6)
15. (a) Explain with an example for breadth first and depth first search traversal of a graph. (16)

Or

- (b) How do you construct a minimum cost spanning tree with Prim's algorithm? Write an algorithm and illustrate with your suitable example graph. (16)