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Question Paper Code: 33202

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

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. What is a heap? Give an example.
7. What is rehashing.
8. Identify the different properties of an equivalence relation in a set.
9. Briefly illustrate the adjacent matrix representation with an example.
10. What is bi-connectivity? Give an example

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Implement an algorithm to polynomials represented as single linked list. (8)
(ii) Develop algorithm for inserting and deleting values from a queue. (8)

Or

- (b) What do you mean by doubly linked list? Write an algorithm for inserting and deleting an element from doubly linked list. Illustrate with example. (16)
12. (a) What is a BST? Explain with suitable algorithms for insertion and deletion of nodes at different instances. Illustrate with suitable examples. (16)

Or

- (b) (i) Describe in detail about insertion routine of BST. (8)
- (ii) Explain the algorithm for expression tree and construct the expression tree for the expression $ab + cde + * *$. (8)
13. (a) Explain the following routines in AVL tree with example: (i) Insertion (ii) Deletion (iii) Single rotation (iv) Double Rotation. (16)

Or

- (b) Explain with examples how a key value can be inserted and deleted in a B-Tree. (16)
14. (a) Explain in detail the path compression techniques. (16)

Or

- (b) Explain the smart union algorithm with example. (16)
15. (a) (i) Explain the Dijkstra's algorithm to shortest path with suitable example. (10)
- (ii) Explain the topological sorting with example. (6)

Or

- (b) Write an algorithm to find the shortest path using Dijkstra's algorithm. Find the shortest path from 'a' to 'd' in the graph given below. (16)

