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**Question Paper Code: 53802**

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Third Semester

Information Technology

15UIT302 - DATA STRUCTURES AND ALGORITHMS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

- Stack is also called as
  - last in first out
  - first in last out
  - last in last out
  - first in first out
- The Preorder traversal of the given inorder traversal is
  - $+/a*bcd$
  - $ab/*cd+$
  - $/*+abcd$
  - $/*ab+cd$
- The in order traversal of tree will yield a sorted listing of elements of tree in
  - Binary trees
  - Binary search trees
  - Heaps
  - None of these
- \_\_\_\_\_ has the disadvantage of requiring pointers.
  - Double hashing
  - Open hashing
  - Closed hashing
  - Open addressing
- In a graph if  $e=[u, v]$ , Then u and v are called
  - endpoints of e
  - adjacent nodes
  - neighbors
  - all the above

PART - B (5 x 3 = 15 Marks)

6. What is abstract data type?
7. Write the recursive procedure for finding the minimum element in a binary search tree.
8. Define a binary heap.
9. How is hashing performed in separate chaining?
10. Define biconnected graph.

PART - C (5 x 16 = 80 Marks)

11. (a) Illustrate with example about the operations performed in Doubly Linked List. (16)

Or

- (b) How will you implement a Queue? Explain with suitable routines and examples. (16)

12. (a) Explain in detail about the different tree traversals available. Draw the expression tree for the expression ' $a/b*(c-d)+e$ ' and find the traversals for the tree. (16)

Or

- (b) Write the necessary function to implement a binary search tree.
- (i) Find the position of an element
  - (ii) Find the maximum element in the tree
  - (iii) Inset an element into the tree
  - (iv) Remove an element from the tree (16)

13. (a) How is an AVL tree implemented? How is balancing performed in an AVL tree? Explain with necessary examples and routines. (16)

Or

- (b) Explain in detail the implementation of Binary heap with suitable examples. (16)

14. (a) What is the purpose of hashing? Explain in detail the different methods of hashing. (16)

Or

(b) Explain in detail about smart union algorithms and path compression. (16)

15. (a) Illustrate shortest path algorithm with example. (16)

Or

(b) Describe Topological Sorting with example. (16)

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