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B.E / B. Tech. (Full Time) ARREAR EXAMINATIONS, NOV / DEC 2012
COMPUTER SCIENCE AND ENGINEERING BRANCH
SECOND SEMESTER
CS181 PROGRAMMING AND DATA STRUCTURES
(REGULATIONS 2004)

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Time: 3 hrs

Max Mark:100

Answer ALL Questions
Part -A (10 x 2 = 20 Marks)

1. What is meant by problem solving? and Mention some of the problem solving strategies?
2. State the difference between arrays and linked lists
3. What is a balance factor in AVL trees?
4. Give the infix expressions for the following prefix expression.
a) * - + A B C D
b) + - a * B C D
5. How are graphs represented inside a computer's memory? Which method do you prefer and why?
6. Differentiate between depth first and breadth-first traversal of graphs
7. Give the applications of priority queues.
8. What is collision in hashing? What are the methods of resolving collision in hashing?
9. Merge sort is better than insertion sort. Why?
10. Which is the best way of choosing the pivot element in quick sort?

Part - B (5 x 16 = 80 Marks)

11. How will you resolve the collisions, while inserting elements into the hash table using separate chaining and linear probing? Write the routines for inserting, searching and removing elements from the hash table using the above mentioned techniques (16)
12. a)(i). Given two lists L1 and L2, write the routines to compute $L1 \cap L2$ using basic operations. (8)
(ii) Write a routine to implement stack of size N using an array. The elements in the stack are to be integers. The operations to be supported are PUSH, POP and DISPLAY. Take into account the exceptions of stack overflow and stack underflow. (8)

(OR)

- b) Define the basic queue structure. How is circular queue implemented? Give example.(16)

13.a) Explain the three standard ways of traversing a binary tree with the recursive Algorithm. (16)

(OR)

b) (i) 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. (8)

(ii) Describe the algorithms used to perform single and double rotation on AVL tree. (8)

14.a) (i). Write the routine for sorting n elements in increasing order using heap sort. (8)

(ii) Sort 3, 1, 4, 1, 5, 9, 2, 6 in decreasing order using heap sort. (8)

(OR)

(b) write a routine and Explain with example about the quick sort. (16)

15. a)(i) What is topological sort? Write an algorithm to perform topological sort (8)

(ii) Write the Dijkstra's algorithm to find the shortest path for a weighted graph. (8)

(OR)

b)(i) Write about kruskal's algorithm (8)

(ii) Find a minimum spanning tree for the following graph using prim's algorithm. (8)

