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Second Semester MCA Degree Examination, June/July 2013

Data Structures Using C

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1
 - a. Explain the steps involved in the life cycle of a system. (05 Marks)
 - b. Explain ADT. Write ADT for natural number. (07 Marks)
 - c. How the performance analysis is done? Illustrate with an example. (08 Marks)
- 2
 - a. Discuss the significance of stacks. (06 Marks)
 - b. Write a program to evaluate the postfix expression using stacks. (08 Marks)
 - c. How does circular queue works? Illustrate with a neat diagram and pseudo code. (06 Marks)
- 3
 - a. Convert the following infix expressions to post fix expressions showing the contents of stack at each step $A + (((B - C) * (D - E) + F)/G) \$(H - J)$. (06 Marks)
 - b. What are linked list? Explain non-sequential list representations. (06 Marks)
 - c. Write a C program to implement queue using linked list. (08 Marks)
- 4
 - a. Explain polynomial representations using linked list and discuss the polynomial addition with neat diagram and functions. (10 Marks)
 - b. Explain sparse matrices representations using linked list. (10 Marks)
- 5
 - a. Explain how binary trees are represented. (06 Marks)
 - b. Traverse the given tree using in-order, pre-order, post order and level order traversal techniques. (04 Marks)

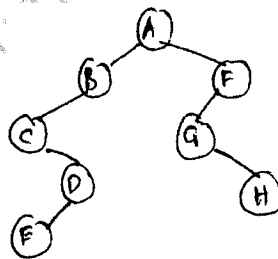


Fig.Q5(b)

- c. Explain binary search tree with its functions such as searching, insertion and deletions. (10 Marks)
- 6
 - a. Explain types of leftist trees. (10 Marks)
 - b. Explain Fibonacci heaps and pairing heaps. (10 Marks)
- 7
 - a. What are optimal binary search trees? Explain with the help of diagram. (06 Marks)
 - b. What are AVL trees? Explain LL and LR notations. (08 Marks)
 - c. What are Red Black Trees? Explain. (06 Marks)
- 8

Write short notes on:

 - a. Performance measurement
 - b. Threaded binary trees
 - c. Forests
 - d. Splay trees. (20 Marks)