MCA – 12

I Semester M.C.A. Examination, Feb./March 2010
DATA STRUCTURE

Time: 3 Hours Max. Marks : 100

Instructions: *1) Answer **all** questions in Part **A**, **5** out of **8** questions in Part **B** and **4** out of **6** questions in Part **C**.*
*2) Part **A** : Questions from **1** to **8** carry **1** mark **each** and **9** to **14** carry **2** marks each.*
*3) Part **B** : **Each** question carries **8** marks.*
*4) Part **C** : **Each** question carries **10** marks.*

PART – A

1. Define Data structure.
2. What is the importance of header nodes?
3. Give the array representation of binary tree.
4. What are the different notations used for time complexity in sorting techniques?
5. Define address calculation sort.
6. Define height of the tree.
7. Define lists.
8. What is Heap ?
9. Define priority queue ?
10. What is complete Binary tree ?
11. How do you push and pop elements in a linked stack ?
12. List out the various techniques of hashing.
13. Analyze the selection sort method of sorting data.
14. Convert following arithmetic infix expression 'Q' into its equivalent postfix expression 'P'

    Q:A+(B*C-(D/E ?E)*G)*H

P.T.O.

PART – B

1. Write an algorithm for transforming infix expression into postfix expression.
2. Explain basic operations of circular queue with an example and also compare the advantages and disadvantages of linear queue and circular queue.
3. Write an algorithm to insert and delete an element in the doubly linked list.
4. Give the three cases involved in deleting a node from a binary search tree.
5. Explain the different operations of Stack.
6. Discuss different tree traversal technique.
7. Explain array implementation of priority queue.
8. Explain the quick sort algorithm.

PART – C

1. Explain any two hash collision resolution technique.
2. Sort the following elements using heap sort. 25 55 46 35 10 90 84 31.
3. Write an algorithm to insert and delete an element in the doubly linked list.
4. Give linked list implementation of stack operation.
5. Define a heap. Sort the following numbers using Heap Sort :

   2, 3, 81, 64, 4, 25, 36, 16, 9, 49

   Clearly write all the steps involved in sorting the numbers.
6. Explain memory representation of tree.

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