2006 PUNJAB TECHNICAL UNIVERSITY M.C.A

DATA STRUCTURES
MCA -302, 3rd Semester (2096)

Time: 3 Hours

Maximum Marks:75

Note: Candidates are required to attempt any nine questions from section B and Section A will be compulsory.

Section A
Q1.
a. What do you mean by order notation in basic time analysis of an algorithm?
b. Define the term non-primitive data structures with the help of suitable examples.
c. Give the recursive implementation of a factorial function.
d. What are the two different types of recursion?
e. How you will implement conversion from Infix to Postfix using stacks?
f. What are the advantages and disadvantages of the linked implementation of a queue relative to the contiguous implementation?
g. What is the difference between linked list and multi linked structures?
h. Give example of Pre-order traversal of a binary tree with minimum of seven modes.
i. How trees are represented using threaded storage representation?
j. What do you mean by AVL trees?
k. How the DFS is different from BFS?
l. Explain the advantages and disadvantages of using a binary search tree.
m. Where the use of radix sort will give good results?
n. Why we need arrays?
o. What do you mean by hashing?

(2X15)

2. Write a detailed note on algorithm analysis for time and space requirements.
3. Differentiate between the terms linear and non linear data structures.
4. Explain the working of stacks and queues taking suitable examples.
5. Discuss the working of Dijkastra's algorithm with the help of suiotable example.
6. Show the relationship between the digraph and it's adjacency matrix.
7. What do you mean by DFS Spanning tree and BFS Spanning tree?
8. Explain the working of selection sort with the help of suitable example.
9. Discuss in brief the working of heap sort algorithm.
10. Devise an algorithm for determining whether two given trees are similar or not?
11. How arrays are useful in manipulation of polynomials?
12. Explain the procedure of inserting and deleting nodes in a doubly linked queue.
13. Write a short note on circularly linked linear lists.

(5X9)