

**MCA-I Semester Supplementary Examinations,
July/Aug 2008.**

DATA STRUCTURES

Time: 3hours

Max. Marks: 60

**Answer any FIVE questions
All questions carry equal marks**

- - -

- 1.a) What are the characteristics of array. Give the C syntax for 1-dimensional and 2-dimensional array declarations.
- b) Write a program to add even and odd numbers from 1 to 10. Store them in two separate arrays and display them.
- 2.a) Write a C program to insert a record at
 - i) the beginning
 - ii) the end and
 - iii) the given position, in a single linked list.
- b) Write a C program to add two polynomials with two variables and n^{th} degree.
- 3.a) Write a C program to implement a stack data structure with all operations.
- b) Simulate how the stack modifies in the implementation of factorial.
- 4.a) Write a C program to perform insert and delete operations with a circular queue and display the elements.
- b) What are the characteristics of priority queue. Declare the data structure used for priority queue.
- 5.a) Write a C program to implement merge sort algorithm.
- b) How to extend simple merge sort algorithm to sort the elements of an unsorted input array?
- 6.a) Write a C program for binary search and analyze the time complexity.
- b) Classify the hashing techniques. Give a brief note about the characteristics of each.
- 7.a) How to construct a unique binary tree if preorder and in order traversals of the tree are given as input.
- b) If the binary search tree is constructed for the input records which are in sorted order, Comment about the nature of output binary search. Suggest a solution.
- 8.a) Construct a heap tree for the following input data
15, 9, 23, 14, 27, 29, 28, 20.
- b) Explain with example, how the threads are introduced in a binary tree to avoid recursion. How to find in order successor of any node using threaded binary tree.

\$\$\$