II/IV B.Tech. DEGREE EXAMINATION

First Semester

Computer Science and Engineering

DATA STRUCTURES

(Common with IT and Dual Degree Programme
in SE/IT)

(Effective from the admitted batch of 2006–2007)

Time : Three hours   Maximum : 70 marks

Question No. 1 is compulsory.

Answer any FOUR questions form the remaining.

All questions carry equal marks.

Answer ALL parts of any questions at one place.

1.   Explain the following :

   (a)   ADT representation of stack

   (b)   Recursive function

   (c)   Circular queue

   (d)   Complete binary tree

   (e)   Insertion sort

   (f)   Matrix representation of a graph

   (g)   Undirected graph.

2. (a) What is an array? Explain about different types of arrays and their representation.

   (b) Write a 'C' program to convert the given infix expression into prefix expression.

3. (a) What is towers of Hanoi problem? Describe the problem for $n = 3$ discs.

   (b) What is a queue? Explain about insertion and deletion operations on queue with an example.

4. (a) Write a 'C' program to concatenate two singly linked circular lists without traversing either of them.

   (b) Define binary tree. What are the applications of binary tree?

5. (a) What is threaded binary tree? Discuss about its traversal.

   (b) Apply quick sort algorithm on the elements

   42, 89, 63, 12, 94, 27, 78, 3, 50, 36.

6. (a) Write a 'C' program for binary search.

   (b) What is dictionary? Explain dictionary as an abstract data type.

7. (a) Draw binary search tree for the elements

   22, 03, 09, 27, 23, 11, 05, 29, 28, 32, 19, 10, 30 and delete the nodes 19, 27 and 22.

   (b) Discuss about the transitive closure of a graph with suitable example.

8. (a) Explain BFS and DFS traversals of a graph with an example.

   (b) Explain Dijkstra's algorithm to find the shortest path between nodes with an example.