

II B.Tech II Semester Supplementary Examinations, Apr/May 2006
DATA STRUCTURES THROUGH C
(Civil Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Write a program to print the sum of rows and sum of columns of a given matrix. [16]
2. (a) Formulate an algorithm that will change the INFO field of the Kth node of a linked list value given by Y.
 (b) Formulate an algorithm which will perform a deletion operation in a single linked list. [8+8]
3. (a) Write a recursive program in C for the following Ackermans function
 $a(m,n) = n+1$ if $m==0$
 $a(m,n) = a(m-1,1)$ if $m!=0, n==0$
 $a(m,n) = a(m-1, a(m,n-1))$ if $m!=0, n!=0$
 (b) Determine what does the following recursive C function computes. Write an iterative function to accomplish the same purpose func()

```
int n ;
{
if (n==0)
return (0)
return (n+func(n-1));
} /* end func */
```

[8+8]
4. If an array holding a queue is not considered circular, the general method suggests that each remove operation must shift down every remaining element of a queue. An alternative method is to postpone shifting until rear equals the last index of the array. When that situation occurs and an attempt is made to insert an element into the queue, the entire queue is shifted down, so that the first element of the queue is in position 0 of the array. What are the advantages of this method over performing a shift at each remove operation? What are the disadvantages? Rewrite the routines remove, insert, and empty using this method. [16]
5. Write a C program to show basic operations on a tree. [16]
6. What are different graph traversal methods. Explain them with neat sketches. [16]
7. Write an algorithm for binary search and explain with a suitable example [16]
8. Trace the action of heap sort in the following list. Draw the initial tree to which the list corresponds. Show how is it converted into a heap.
 26,33,35,29,19,12,22. [16]
