

II B.Tech I Semester Supplementary Examinations, November 2005
DATA STRUCTURES THROUGH C
(Common to Mechanical Engineering, Mechatronics, Metallurgy & Material
Technology, Production Engineering and Aeronautical Engineering)
Time: 3 hours Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Write a C program to check whether a given string is palindrome or not. [16]
2. Write an algorithm to perform each of the following operations to a circular linked list.
 - (a) Insert an element at the left position of the nth node.
 - (b) Delete an element at the left position of the nth node. [8+8]
3. (a) Write a C Program to convert a prefix string to infix string
(b) Transform the following prefix expressions to postfix, using the above approach
++ A - *\$BCA/ + EF * GHI [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. (a) Write a C function for inorder traversal of a binary tree.
(b) define the following terminology in a binary tree
 - i. leaf nodes
 - ii. non leaf nodes
 - iii. ancestors of one leaf node
 - iv. depth of the tree
 - v. siblings to one non leaf node
- (c) Write C program for depth first search of graph. [6+5+8]
6. (a) Show a graph, and show the possible adjacency matrix and adjacency list representations for the same.
(b) Using adjacency list representation of your selected graph, perform Breadth first search and Depth first search. [8+8]
7. (a) Compare and contrast the advantages of various searching mechanisms

- (b) Write a recursive C function for binary search method. [8+8]
8. Write an algorithm for bubble sort and sort the following using bubble sort
85,12,108,27,91,4,72 [16]
