SECOND SEMESTER EXAMINATION 2005

DATASTRUCTURE USING 'C'

Question 1

a. Consider the array a[10] of floats; if the base address is 1000. Find the address of a
b. Given a link list a part of which is shown below , write an algorithm for inserting a new node after the node containing 22 to which the pointer p points.
c. Define a stack: give two examples (from computer science) where you use stack?
d. Store the following polynomial in linked list:
e. Write the sequence of the nodes that will be processed in the post order traversal to the tree given below:
f. A binary tree has 10 nodes; how many edges does it have? Draw a complete binary tree with 10 nodes to check your answer.
g. Write down the adjacency matrix of the following graph.
h. Convert the following infix expression to postfix expression:
i. With the sequence of in puts
   10,8,20,5,3
   Construct a height balanced binary tree search tree.
j. Define recursion ; give two examples (from computer science) where u can use recursion.

Question 2

a. Write a c program to (i) cteate an array of integers and (ii) to print the even integhers in the array(iii) to print every third integer starting from a[0].
b. Convert the following infix expression to one in post fix expression:

Question 3

a. Given a doubly linked list:
   Write a block of c code to delete the node containing 20 to which the pointer p points.
b. Use a stack to evaluate the following expression:

Question 4

a. Write a c program to sort a given array of integers in increasing order , using bubble sort technique.(5)
b. Explain quick sort algorithm. You may use the following sort of integers to illustrate your case:
   41,31,11,51,71,91,61,99,21,81(5)

Question 5

a. Create a heap from the following sequence of integers.
   50,40,60,80,70,20,90,10,8,2,5,100

b. Use the radix sort to sort the following integers;
   128,539,365,861,792,573,274,255,427

Question 6

a. Define the directed graph . from the given directed graph determine the adjacency matrix. Define the reachability matrix of a directed graph. Write down the reachability matrix of the graph given above by inspection.
b. Describe warshll's shortest path algorithm for the directed graph.(5)

Question 7

a. What do you mean by hashing ? Describe any three functions with examples.(5)
b. Given the directed graph below, find the order in which the node shall processed in abreadth-fisrt search, starting from the node 'a'.

Question 8

a. Given the tree below describe the order in the nodes will be processed in the pre order traversal of the tree.(5)
b. (i) write a short note on garbage collection.(2)
   (ii) Define a sparse matrix; how sparse matrix can be stored effectively and efficiently?(3)