B - 601

(Pages : 03)

COMP 4-2 (RC)

[Total No. of Questions : 8]

S.E. (Computer) (Semester - IV) (Revised Course 07 - 08) Examination, Nov. - 2011

DATA STRUCTURES

Duration : 3 Hours

Total Marks : 100

Instructions : 1) Answer any five questions, at least one from each module.
2) Make suitable assumptions wherever necessary.
3) Draw appropriate diagrams, wherever necessary.

MODULE - I

Q1) a) Explain following functions with respect to files **[6]**

i) fscanf( ) ii) fgetc( )

iii) fopen( ) iv) fprintf( )

b) Explain any three commonly used functions in string.h header file. **[6]**

c) Write a short note on efficiency of recursion. **[5]**

d) What are Macros? **[3]**

Q2) a) Write a recursive function to implement Towers of Hanoii problem. **[6]**

b) What is a doubly linked list? What are its advantages over singly linked list. **[4]**

c) Explain recursion with factorial function in C. **[5]**

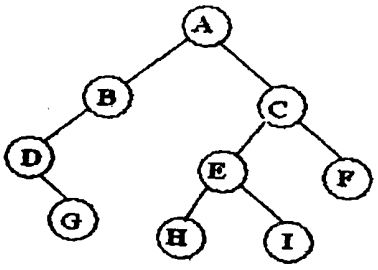
d) Write C routines on primitive operations of circular linked lists. (Any Two). **[5]**

MODULE - II

Q3) a) Write a C code for linked list implementation of Stack. **[6]**

b) Write C code for array implementation of Queues. **[6]**

c) Write C code for all three traversal methods of a binary tree. Also apply the same for the following tree. **[8]**



P.T.O.

Q4) a) Explain balanced trees with an example. [4]

b) Write C code for any three primitive operations on Binary Tree. [6]

c) Define [6]

i) strictly binary tree

ii) complete binary tree

iii) Almost Complete binary tree

d) What is threaded Binary tree? What are its advantages? [4]

MODULE - III

Q5) a) Let G be a graph with vertices and edges as follows

V(G) = {A, B, C, D, F}

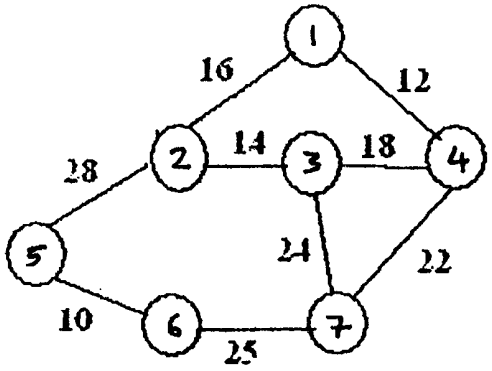
E(G) = {<A, B>, <A, D>, <A, C>, <C, D>, <F, C>}

i) Draw the graph [2]

ii) Draw the adjacency matrix and adjacency list. [5]

b) Explain the declaration for a weighted graph with fixed number of nodes. [4]

c) What is a minimum spanning tree? Find minimum spanning tree for the following graph. [5]



d) Write a short note on connected components. [4]

Q6) a) What is automatic list management. Explain any one method of automatic list management. [5]

b) Why is dynamic memory management required? Explain with an example. [5]

c) Explain First-Fit, Best-Fit and Worst-Fit methods. [5]

d) Write short note on Variations of garbage management. [5]

MODULE - IV

Q7) a) Explain the advantages of binary search tree. [4]

b) Write short note on [5]

i) chaining ii) rehashing

c) Sort the following using selection sort. Show the output after each iteration [6]

40, 4, 7, 20, 18, 2, 16, 3, 85

d) Write a C program for a linear search. [5]

Q8) a) Explain shortest path algorithm. Give an example. [6]

b) Explain binary search method to search 24 for the following input array. [5]

15, 20, 24, 38, 62, 90, 95

c) With an example explain Bubble sort. [5]

d) Explain [4]

i) clustering ii) buckets

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