G - 1073 (Pages : 03) COMP 4-2 (RC)

[Total No. of Questions : 8]

S.E. (Computer) (Semester - IV) (Revised 07 - 08) Examination, May/June 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) What is the function of pointer variable? What are its uses? **[5]**

b) What is a union? How it is different from structure? **[4]**

c) What are the three steps that are followed while accessing a file? Explain. **[5]**

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

Q2) a) What is doubly linked list? Provide function to delete an element. **[6]**

b) What are the advantages of using dynamic representation over array representation? **[5]**

c) Differentiate between circular linked lists and doubly linked lists. **[4]**

d) Write a program to find sum and average of all elements in a linked list. **[5]**

MODULE - II

Q3) a) Explain the concept of Stack. Explain basic operations performed on stack. **[5]**

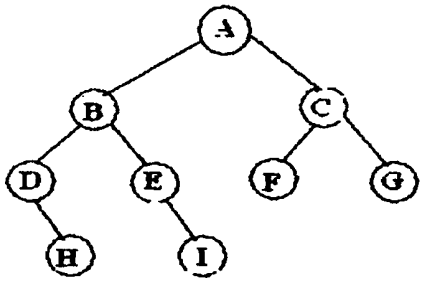
b) What are basic Queue operations? Write a program to implement circular Queues. **[7]**

c) What are the advantages of circular queues over simple queues? **[4]**

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

P.T.O.

Q4) a) Perform the three traversal methods for the following binary tree. [6]



b) Write C routines for any two traversal methods for the binary tree. [5]

c) Define strictly binary trees and complete binary tree. [4]

d) Provide C implementations of the binary tree operations under the dynamic node representation for ***maketree(x)*** function and ***setleft(p,x)*** function. [5]

MODULE - III

Q5) a) Explain with respect to graph. [5]

i) Digraph

ii) Degree

iii) Indegree

iv) Weighted graph

v) Path of length K

b) Write a C representation for Graphs. [4]

c) What are the various methods for graph traversals technique? Briefly explain with an example. [8]

d) Write a short note on connected components. [3]

Q6) a) Explain reference count method with the help of an example. [5]

b) Compare the First Fit and Best Fit methods with example. [6]

c) Write a short note on the variations of garbage collection method. [5]

d) What is collection and compaction? [4]

MODULE - IV

Q7) a) Explain how stack can be used for evaluation of Postfix expression with an example. [6]

b) Explain shortest path algorithm. Give an example. [8]

c) Write a C program to implement Bubble Sort. Also trace with an example. [6]

Q8) a) Differentiate between linear search and binary search methods. Determine the efficiency of each method. Provide suitable example. [7]

b) Write a shot note on Linear Hashing. [5]

c) Write short notes on:

i) Selection Sort

ii) Radix sort [8]

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