BITS, PILANI Dubai Campus
Knowledge Village

Computer Programming II Comprehensive Exam

Max Marks : 40 Weightage : 40% Nature of Test : Closed Book
Date 06-1- 04

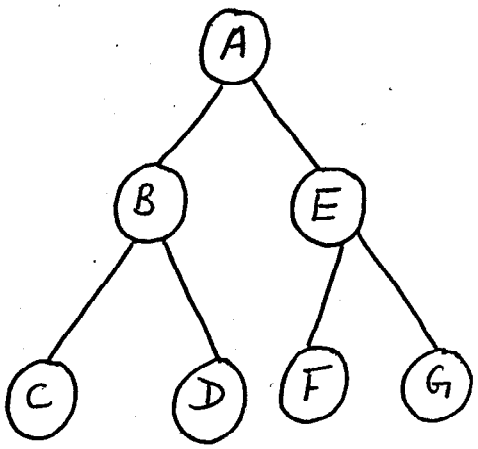
Answer **all** questions
All questions carry **equal** marks 8 **X 5 = 40**

1. Create a structure that can describe a restaurant. It should have members that include the name, address, average cost and the type of food. Write a routine that prints out all the restaurants of a given food type in order of cost, with the least costly first.

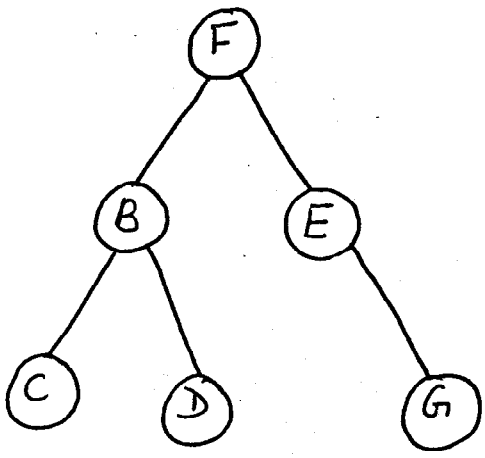
2. Write a program using Linked lists to implement the deletemin function where the smallest element in the LL is searched and then it is deleted.

3. Write a function that deletes the root node of a binary tree and replaces the root with the rightmost leaf node.

BEFORE :



AFTER :



4.Write a program to read data from a file input.dat. Read this file and sort the words in the file lexicographically.

Eg input : A is for alphabet or apple pie
which all get a slice of come taste it and try

Eg output :

A
a
all
alphabet
.
.
.
.
.
.
.
which

Use **pointers** in the sort function. Write the sorted data to a file output.dat

5.Define a complex system. What role does decomposition play ? Name the different types of decomposition

6.Explain clearly the concept of abstraction and hierarchy with examples

7.a. Suppose S is a list of 14 alphabetical characters. Use quick sort and demonstrate its working in the first three passes. Assuming pivot to be the first element.

S: DATASTRUCTURES

b. Write a recursive solution to quicksort. Assume that the pivotal element is selected either randomly or by using the median function on the array .

8. What is efficiency of an algorithm ? Explain the different ways in which the efficiency of an algorithm can be improved.

BITS, PILANI – DUBAI CAMPUS
Knowledge Village, Dubai
FIRST SEMESTER 2003-2004

Course Number : TAUC 252
Course Title : Computer Programming 2
Test : 1

Max Marks : 20
Weightage : 20%
Nature of Test : Closed Book
Date 9-11-03

Answer all questions

1. What do you mean by an efficient algorithm. Discuss about the different ways of analysing algorithms. - 6 marks

2. Given two linked lists L1 and L2 write a procedure to create the linked list in a sorted fashion and then write a procedure to compute L1 $\cap$ L2 and write this to a third Linked List L3. - 6 marks

3. Write short notes for each of the following :

   a. Top Down Design
   b. Diffrenciate between calloc and realloc
   c. What is a queue and the different types of queues
   d. Explain the terms overflow and underflow and the remedy for these. – 2 x 4 = 8 marks

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Computer Programming II Test II

Max Marks : 20 Weightage : 20% Nature of Test : Open Book
Date 14-12- 03

Answer all questions
Strictly text books and class notes only

1. If the given sequence lists the nodes of a binary tree T in Preorder and Inorder respectively :

Preorder : G,B,Q,A,C,K,F,P,D,E,R,H
Inorder : Q,B,K,C,F,A,G,P,E,D,H,R

Draw the tree T - 4 marks

2. Consider the algebraic expression $E = (2a+5b)^3 (x-7y)^4$
a) Draw the tree T corresponding to the expression E
b) Find the scope (subtree) of the exponential operators
c) Find the preorder notation of T - 4 marks

3.If T is a binary tree T Write a recursive function which finds the depth DEP of T

Note : The depth dep of T is 1 more than the maximum of the depths of the left and right subtrees of T - 4 marks

4. What is the order of the algorithm that has a growth rate function
   a. $8*n^3 - 9*n$
   b. $7 * \log_2 n+n$
   c. $4*n^5 + n*\log_2 n$ - 3 marks

5. Let comm.(n,k) represent the number of different committees of k people that can be formed,given n people from whom to choose.
For eg comm.(4,3) = 4 i.e given 4 people A,B,C,D the committees that can be formed are ABC,ACD,BCD,ABD
Write and test the recursive solution for n,k >=1.Obtain the base case and show how the recursive call works for a specific input - 5 marks