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	6E3113	
B.Tech. VIth Semester (Main) Examination, June - 2010		
Electrical Engineering		
6EE5 Data Structures in C (Common for 6EE5 & 6EX5)		

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 24

Instructions to Candidates:

Attempt overall five questions selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)

Unit - I

1. a) Define the terms data structure & abstract data structure. (4)
- b) Write notes on the following :
 - i) Big-oh notation
 - ii) Recursion
 - iii) Divide & conquer strategy. (12)

Unit - II

- 2 Write the algorithms for the following :
 - a) Interchange the elements of position P & next (P) in a singly linked list. (8)
 - b) Locating an element on a sorted list using Array representation. What is the running time of each of these algorithm? (8)

Unit - III

3. a) Write a method to convert an infix expression to postfix notation. Show these steps to convert the following expression to postfix form.
 $(3 * 2 * 5) / (3 * 2 - 3) + 5$ (8)
- b) Write down the algorithm to implement two stacks using only one array. (8)

OR

- a) What is a stack? Write a program showing array based implementation of stack. (8)
- b) Write algorithm to convert an infix expression to prefix expression. (8)

Unit - IV

4. a) Write an algorithm to delete an element X from a binary search tree. Do the time analysis of your algorithm. (8)
- b) Explain how the balance is restored when an insertion into height balanced tree puts a node out of balance. (8)

OR

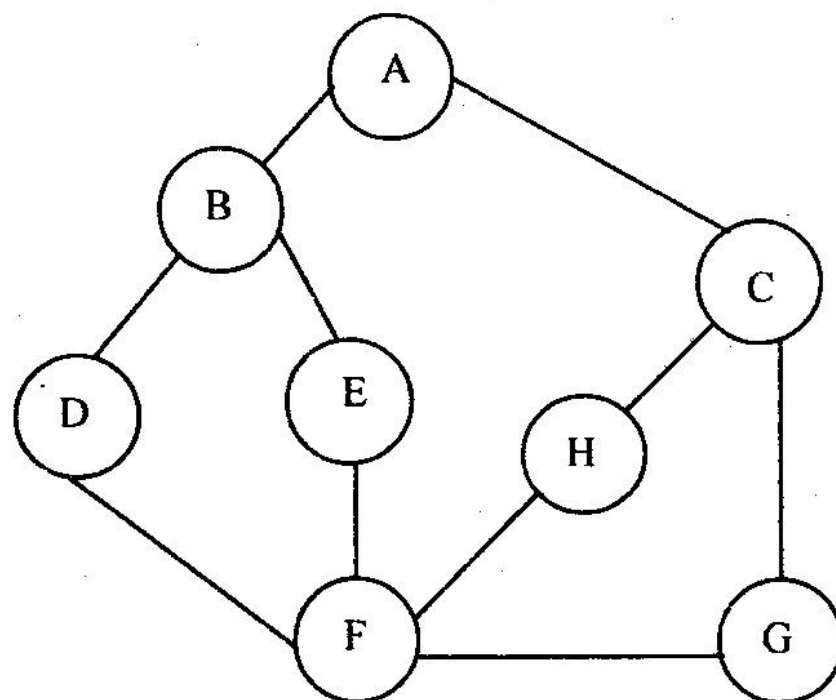
- a) Insert the following entries into an initially empty B-tree of order 5 : (10)
a, g, f, b, k, c, h, n, j, d, r, i, s, x, e, l, m, t, u, v.
- b) What are the advantages & disadvantages of circular linked list? (6)

Unit - V

5. a) Find out the time complexity of Quick sort. What happens if all the keys in the list are equal in case of Quick sort? (8)
- b) Write the algorithm for Insertion sort. How many key comparisons are made in its worst case? (8)

OR

- a) What are connected components of a Graph? Write a method to find out all connected components of a graph. (10)
- b) A graph is shown below :



Give Adjacency Matrix & List representation. (6)