6E3113

Roll No. _____ [Total No. of Pages : 2

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

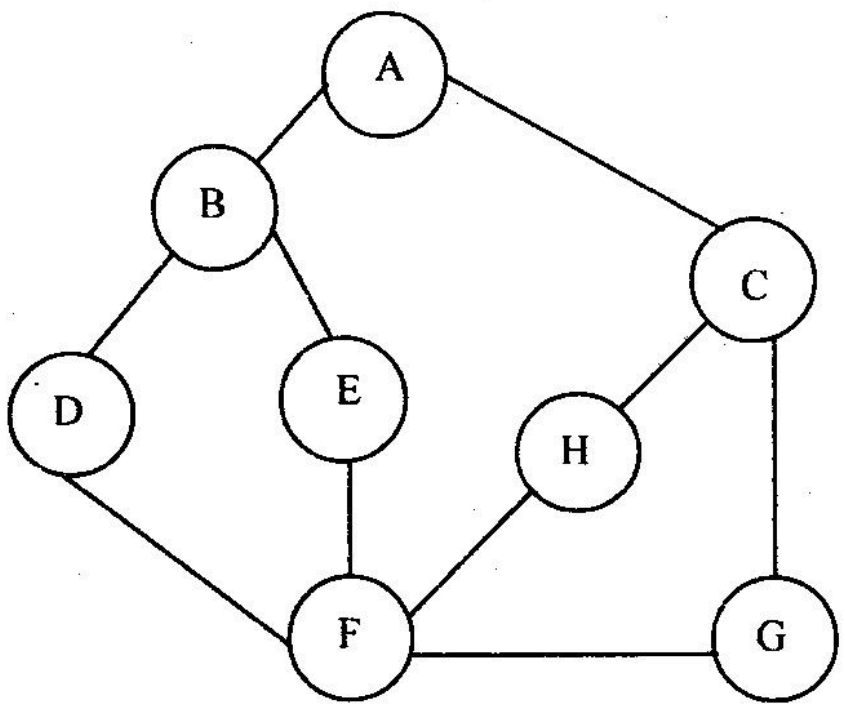
5. a) Find out the time complexity of Quick sort. What happens if all the keys in the list are equal in case of Quick sort? **(8)**

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)**
