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BMS College of Engineering, Bengaluru-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

December 2015 Semester End Main Examinations

Course: Data Structures **Duration: 3 Hours**

Course Code: 15CS3DCDST **Max Marks: 100**

Date: 10.12.2015

Instruction: Answer any five full questions choosing one from each unit.

UNIT-I

1. a) What is recursion? Write a program to generate n fibonacci numbers using a recursive function. **06**

   b) Develop a program to convert an infix expression to postfix expression. **08**

   c) What is linear queue?Brief out operations on it. What is the disadvantage in linear queue. **06**

UNIT-II

2. a) Design a C program to create a singly linked list by alternatively inserting at the beginning and at the end of the list. **08**

   b) Discuss the advantages of linked lists over arrays. **04**

   c) Develop a C program for sorting a given singly linked list. **08**

OR

3. a) Design a C program to implement queue using circular linked list. **08**

   b) Develop a C program to create a doubly linked list by inserting elements at the end and also write a function to delete a node after a specified element. **12**

UNIT-III

4. a) Implement the following operations on a binary search tree: **09**

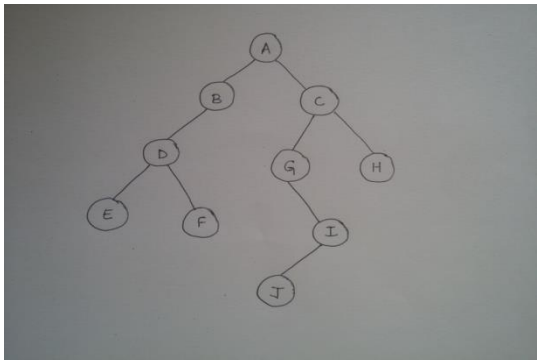
      (i) Create

      (ii) Delete a node with no children.

      (iii) Display

   b) Explain in detail the two representations of tree. **05**

c) For the given tree, write the preorder, postorder and inorder traversals. **06**

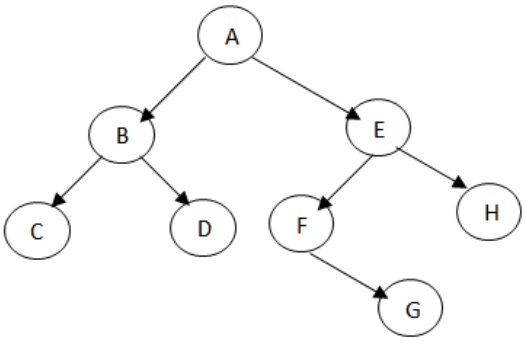


UNIT-IV

5. a) Define height balanced tree with its advantages. Construct a height balanced binary tree (AVL tree) for the following data 42,06,54,62,88,50,22,32,12,33. **08**

b) Explain binomial and Fibonacci heaps. **05**

c) Why Threaded binary tree is required? Draw a right in threaded binary tree for the given tree. **07**



OR

6. a) Show the result of inserting the keys. **06**
F,S,Q,K,C,L,H,T,V,W,M,R,N,P,A,B,X,Y,D,Z,E in the order to an empty B-tree of degree 3.

b) Explain the insertion procedure of a node in the 2-3 Tree. **06**

c) Briefly state the Huffman coding algorithm. Show how you would use Huffman coding to encode the following set of tokens: **08**
AAABDCEFBBAADCDF

UNIT-V

7. a) The following values are to be stored in a hash table. 25, 42, 96,101,102,162,197. Describe how the values are hashed by using division method of hashing with table size of 7. Use Chaining as the method of collision resolution. **10**

   b) Write an algorithm for selection sort. Describe the behaviours of selection sort when the input is already sorted. **10**

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