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BMS College of Engineering, Bengaluru-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

July / August 2016 Supplementary Examination

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

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

Date: 03.08.2016

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

UNIT-I

1. a) Write a program for push and pop operations of a stack. **08**

   b) Convert the following infix expression to postfix form using stack (x+y*z+(p*q+r)*s). Follow usual precedence rule and assume that the expression is legal. **04**

   c) Using array to implement the queue structure, Write functions. **08**
   i) Insert an element in the queue
   ii) Delete an element from the queue

UNIT-II

2. a) Develop a C program to delete a node before the specified element using singly linked list. **08**

   b) Differentiate between arrays and linked lists. **05**

   c) Design a C program for reversing a given singly linked list. **07**

OR

3. a) Build a C program to implement stacks using linked list. **06**

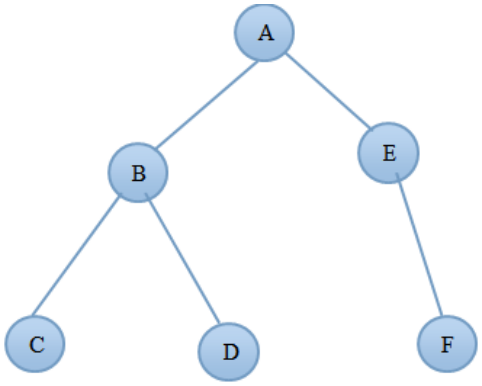
   b) Design a C program to insert an element at the end of a doubly linked list. **05**

   c) Develop a C program to implement addition of two polynomials using linked list. **09**

UNIT-III

4. a) Discuss the following with neat diagrams a)Binary tree b)balanced binary tree c)complete tree. **06**

   b) Explain post-order traversal with pseudo-code and an example. Write the postorder traversal and walking order for the tree shown below. **08**



   c) Brief out on Binary search tree. Explain with pseudo-code and an example how to add a node to an binary search tree. **06**

UNIT-IV

5. a) Starting with an empty tree, construct an AVL tree by inserting the following keys in the order given 2,3,5,6,9,8,7,4,1. If an insertion causes the tree to become unbalanced, then perform the necessary rotations to maintain the balance. **08**

   b) Show the result of inserting the values 2,1,4,5,9,3,6,7 into an empty splay tree. Show the tree at the end of each insertion. Show each rotation. **05**

   c) What are the steps involved in creating a Huffman code? Build a Huffman tree from the following frequency table **07**

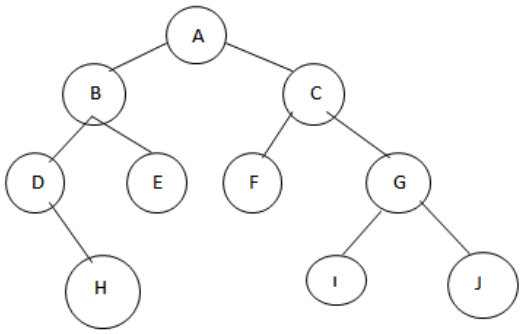
Character	A	B	C	D	E	F	G	H
Frequency	0.20	0.04	0.07	0.11	0.32	0.06	0.05	0.15

OR

6. a) Draw a B-Tee of order 3 for the following sequence of key 2,4,9,8,7,6,3,1,5,10. **05**

   b) Explain the insertion of a node into a B Tree .Write a procedure for the deletion of elements in a B-tree. **10**

c) Transform the following binary tree to a right in-threaded binary tree **05**



UNIT-V

7. a) Design a radix sort algorithm. Show step by step procedure to sort the following queue of objects whose keys are 89 45 76 12 56 90 32 65 03. **10**

b) Explain any two hashing method with an example. Explain in detail open addressing technique to resolve the hash clashes. **10**

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