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BMS College of Engineering, Bengaluru-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

January 2016 Semester End Make Up Examinations

Course:Data Structures with C **Duration: 3 Hours**
Course Code:15IS3DCDSC **Max Marks: 100**
Date: 21.01.2016

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

UNIT-I

1. a) Develop a C routine to add two polynomials. **08**
   b) Explain the space efficient representation of sparse matrix **06**
   c) Derive the addressing formula for any element A[i0][i1] . . . [in-1] in an n-dimensional array. **06**

UNIT-II

2. a) Implement a C program to reverse a string using stack. For example given a string NLP-PYTHON should be converted as NOHTYP-PLN **08**
   b) Write a C program to find the sum of N numbers in an array using recursion. **06**
   c) Convert following infix expression to postfix and prefix expression **06**
      i. A-B/(C*D$E)
      ii. ((A+B)*C-(D-E))$(F+G)
      iii. A$B*C-D+E/F/(G+H)

UNIT-III

3. a) Explain circular queue configuration, with a neat sketch. Write' C ' function for doubling queue capacity. **08**
   b) Write the abstract data type Queue. **04**
   c) Provide initial maze algorithm, and analysis of path. **08**

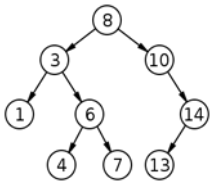
OR

4. a) Explain the capabilities to represent chains in 'C'. **05**
   b) Write a 'C' function to insert into front of singly linked list. **05**
   c) Develop a ' C' function to delete from a linked list. **05**
   d) Write a ' C' function to erase a circular list. **05**

UNIT-IV

5. a) Develop a C routine that deletes every alternate node starting from the second node from a doubly linked list (i.e. delete the nodes 2, 4, 6 -----etc). **06**

b) With reference to the binary tree, give the three tree traversals along with the C routine. **10**



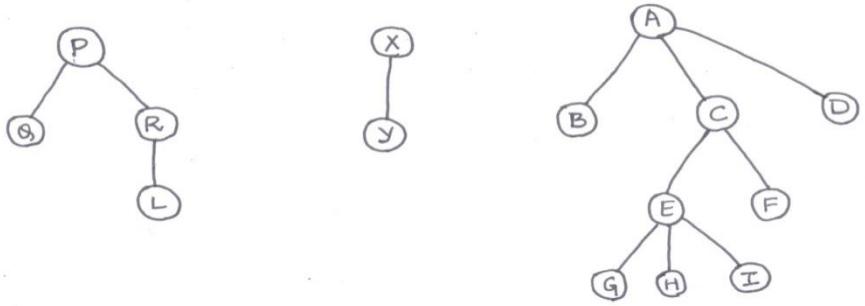
c) Develop a C routine to find the length of a circular linked list. **04**

UNIT-V

6. a) What are threaded binary trees? List various types of threaded binary tree and give examples. **08**

b) Construct a binary tree whose preoder and inorder traversals are as given below **05**
Preorder : ABDCEFHG
Inorder : BDAFHEGC

c) Demonstrate the step by step procedure of converting the given forest into a binary tree. **07**



OR

7. a) Develop ‘C’ routines to insert into and delete from a Binary Search Tree. **12**

b) Explain winner trees and loser trees with an example for each. **08**

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