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III SEMESTER B.TECH. (COMPUTER SCIENCE AND ENGINEERING) DEGREE

END-SEMESTER EXAMINATION DECEMBER-JANUARY 2014 -15

SUBJECT: Data Structure Using "C" (CSE -205)

DATE: 03-01-2015

TIME: 3 HOURS MAX.MARKS: 50

Instructions to Candidates

- **Note:** Answer any **FIVE** full questions.

1A. Describe the logic to implement circular queue operations using two stacks. Write "C" code to implement your logic using static arrays. Your code should check queue empty and full conditions.

1B. Give the DFS traversal order for the graph given in Fig1B.

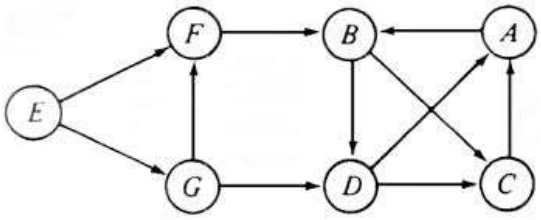

Fig.1B

1C. What is enumerated type? Explain with example. (5+3+2)

2A. What is an AVL tree? Create an AVL tree for a given numbers 3,2,1,4,5,6,7,16,15,14 by showing the necessary rotations.

2B. Explain the steps to construct a binary tree for a given inorder and pre order traversal. Using the same construct a binary tree for a given inorder: D B E A F C and Preorder: A B D E C F. (6+4)

3A. Convert manually the following infix expression to postfix and prefix. Show the intermediate steps. (Note: A$B is nothing but A^B)

a. A+ (B * C-(D/E$F)*G)*H b. A$B$C+(D+(E-F/G)+H*I)$J

3B. Write and describe all pair shortest algorithm. And trace the same for the graph given in Fig3B. (4+6=10)

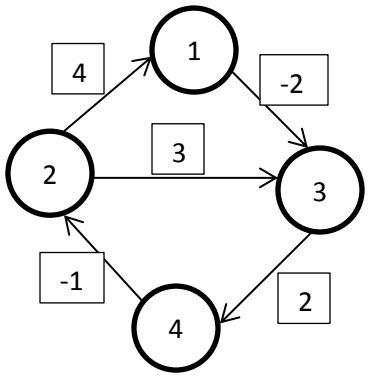

Fig.3B.

4A. Write the code to perform the following functions on singly linked list

i. Insert_rear(NODE first, int ITEM) : Used insert ITEM to the list at the rear end.

ii. Insert_front(NODE first, int ITEM) : Used insert ITEM to the list at the front end.

4B. Write the code to perform the following functions on singly linked list

i. Delete_value(NODE first,int ELE) : deletes the node with the given element ELE

ii. Display(NODE first) : Will display elements of the list.

4C. Describe any one overflow handling method in hashing. (4+3+3)

5A. Give a comparison between iterative and recursive algorithms. Write a recursive function TH(int n, int source, int temp, int destination) to solve Tower of Hanoi problem. Give the output for TH(3,S,T,D).

5B.

i. Construct a Binary Search Tree (BST) for in the order of the elements given as: 150, 130, 140, 180, 160, and 158,170. Explain the logic used to construct BST.

ii. Explain the steps to delete the following elements from the tree constructed in 5B.a show the BST after each deletion.

a. 130
b. 180
c. 160 (5 + 5 =10)

6A. Write a function to sort the elements in ascending order using quick sort. Using the same sort the elements 65, 70, 75, 80, 85, 60, 55, 50, 45 in ascending. Show the intermediate steps.

6B. Given two doubly linked lists (L1, L2) representing 2 sets, create new list c3 (using insert rear method) which is the union of these two lists. (6+4)