Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

III SEMESTER B.TECH (COMPUTER SCIENCE AND ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2015

SUBJECT: DATA STRUCTURES USING C [CSE 205]

(Old Syllabus)

REVISED CREDIT SYSTEM

Time: 3 Hours   Date: 1-12-2015   MAX. MARKS: 50

Instructions to Candidates:

❖ Answer any *five* full questions.

❖ Missing data, if any, may be suitably assumed.

1A. Convert manually the following infix expression to postfix and prefix. Show the intermediate steps. (Note: A$B is nothing but A^B)
  i. A+(B * C-(D/E$F)*G)*H
  ii. ABC+(D+(E-F/G)+H*I)$J   4M

1B. Explain with an example, how do you analyze the performance of an algorithm.   3M

1C. Write a complete C++ program to perform the following operations on a Circular Queue: i) Insert   ii) Delete   3M

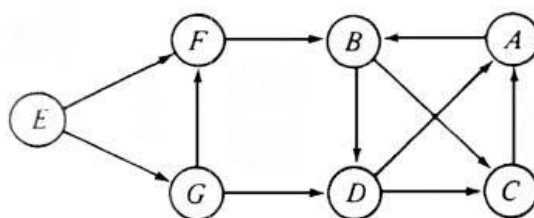2A. Give the BFS traversal order for the graph given in Fig1A.using node 'A'.

3M

Fig.2A

2B. What is a doubly linked list? How it is advantageous over singly linked list?   2M

2C. 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.   5M

3A. What is an expression tree? Write a function to create an expression tree for given postfix expression.   4M

3B. Write a function to add two polynomials represented by two singly linked lists, A and B and return the new polynomial, C.   4M

3C. Describe any one overflow handling method in hashing.   2M

4A. 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. 4M

4B. Write an algorithm to convert a given infix expression to its postfix form using stack. 4M

4C Construct a Binary Search Tree for the input given in the order of 12, 3, 14,8.21,9,2 And print the elements using post order traversal. 2M

5A. Write and explain the function for Quick Sort. Trace the function for the following input values: 45, 26, 27, 70, 14, 90 4M

5B. Given two doubly linked lists(L1,L2) representing 2 sets, create new list L3(using insert_rear method) which is the union of these two lists. 4M

5C. Write a function to reverse a singly linked list without using another list.

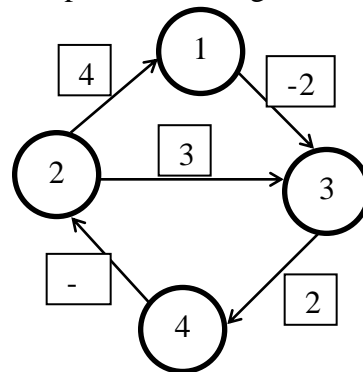6A. Write and describe all pair shortest algorithm. And trace the same for the graph given in Fig6A. 4M

Fig.6A.

6B. Given inorder and pre order traversal explain the steps to construct a binary. 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. 4M

6C. Write a code to implement stack operations (push and pop) doubly linked list. 2M