

PGDCA / MCA (I YEAR)

Term-End Examination

June, 2011

CS-04 : DATA STRUCTURES THROUGH
"C" AND "PASCAL"

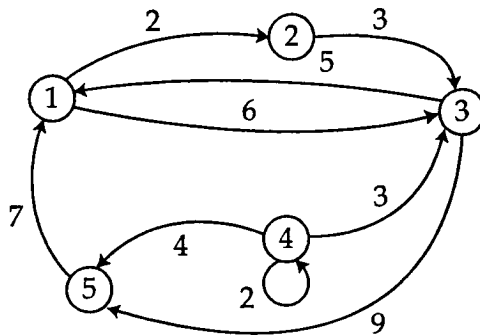
Time : 2 hours

Maximum Marks : 60

Note : Question number 1 is compulsory. Answer any three questions from the rest. All algorithms should be written nearer to "C" or "Pascal" language.

1. (a) Write a program that sorts a given linked list of integers. Also, write a function that splits this linked list into a linked list of even numbers and linked list of odd integers. 10
- (b) Write a program to find the frequency of words in a given paragraph. Show output as words listing with frequency. 7
- (c) Assume that 'TOP' consists of the address of the root node of Binary Search Tree (BST). Write a program to delete an element from BST if it exists else return -1. 7
- (d) Explain insertion sorting with an example. Give other situations in which insertion sort is most efficient. Also, explain how the worst case can be avoided. 6

2. (a) Write a program to perform PUSH and POP operations on stack using pointers. 5
- (b) Indicate and explain situations which need for "Double rotation" in an AVL Tree while inserting elements. 5
3. Represent a binary tree using pointers and write a program to traverse a given tree level by level. In a particular level, the nodes are to be traversed from left to right. 10
4. (a) Write a program to implement functions for insertion and deletion of an element in/from circular queue. 5
- (b) Consider the following graph : 5



Make the adjacency matrix for the given graph. Also, write an algorithm to find the transpose of the matrix.

5. Explain the following with an example. **2½x4=10**
- (a) Spanning Tree
 - (b) Column Major Order
 - (c) Weakly Connected Graph
 - (d) Pre - Order Traversal
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