T1723A / T1529 DATA STRUCTURE & ALGORITHM ANALYSIS 24/05/2017

SE SEM III IT CBGS MAY 2017

Q.P. Code: 552300

(3 Hours) [Total Marks : 80

N.B. : (1) Question No.1 is Compulsory.
(2) Answer any three out of remaining questions.
(3) Assume suitable data if necessary.
(4) Figures to the right indicate full marks.

1. (a) Explain asymptotic notations. 3

(b) What are linear and non-linear data structures. 3

(c) What is recursion ? State its advantages and disadvantages. 3

(d) What is expression tree ? Give examples. 3

(e) What is depth, height and degree of Binary tree. 3

(f) Define graph. List its types with examples. 3

(g) Define minimum spanning tree. 2

2. (a) Write a program for implementing QUICK SORT and comment on its complexity. 10

(b) Write a program for implementing STACKS using arrays. 10

3. (a) Construct the binary tree for the in order and pre-order traversal sequence given below :- 10

IN ORDER:- ENGINEERING
PRE ORDER :- E G N EN I I R E N G

(b) Write functions to implement insert ( ) and traverse ( ) of singly linked-list. 10

[TURNOVER

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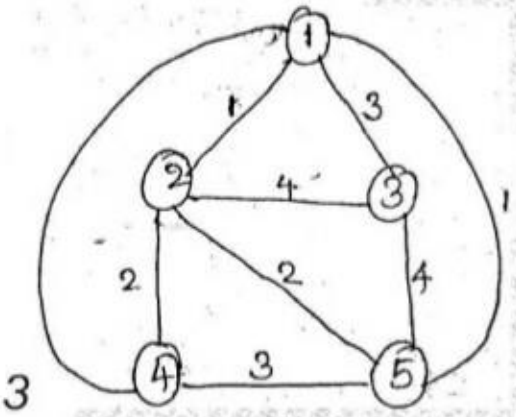
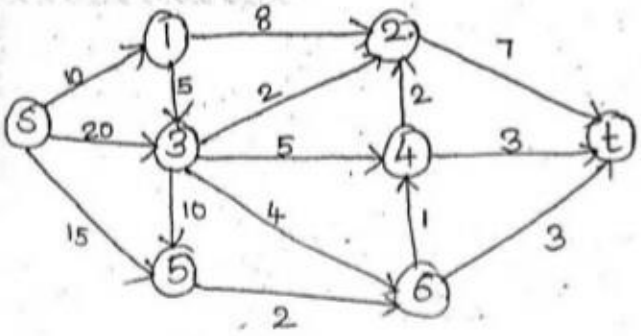
4. (a) What is Minimum Spanning Tree? Draw the MST using kruskal and prim's Algorithm and find out the cost with all intermediate steps. **10**



(b) Write the algorithm for deletion of a node in Binary Search Tree. Explain all the three cases of traversals. **10**

5. (a) Write an algorithm for the following operations on doubly linked list. **10**
   (1) Insertion
   (2) Forward Traversal
   (3) Reverse Traversal

(b) Find the shortest path using Dijkstra's Algorithm. **10**



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6. Solve (**Any Four**) 20
   (1) Priority Queue
   (2) AVL Tree
   (3) BFS -Breadth First Search
   (4) Circular linked list
   (5) Insertion Sort
   (6) Red Black Trees.

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