

24/05/2017

S.E. 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.

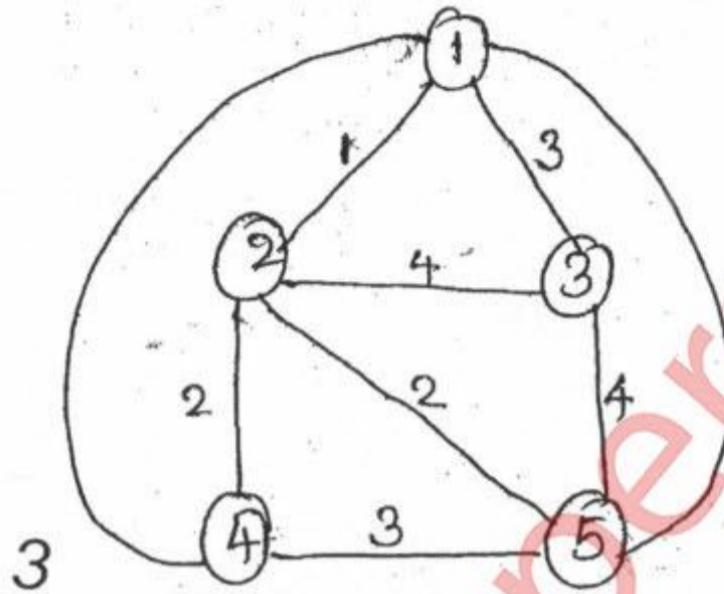
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|--------|--|----|
| 1. (a) | Explain asymptotic notations.  | 3  |
| (b)    | What are linear and non-linear data structures.  | 3  |
| (c)    | What is recursion ? State its advantages and disadvantages.  | 3  |
| (d)    | What is expression tree ? 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 :-<br>IN ORDER:- ENGINEERING<br>PRE ORDER :- E G N E N I I R E N G | 10 |
| (b)    | Write functions to implement insert ( ) and traverse ( ) of singly linked-list.  | 10 |

[TURNOVER

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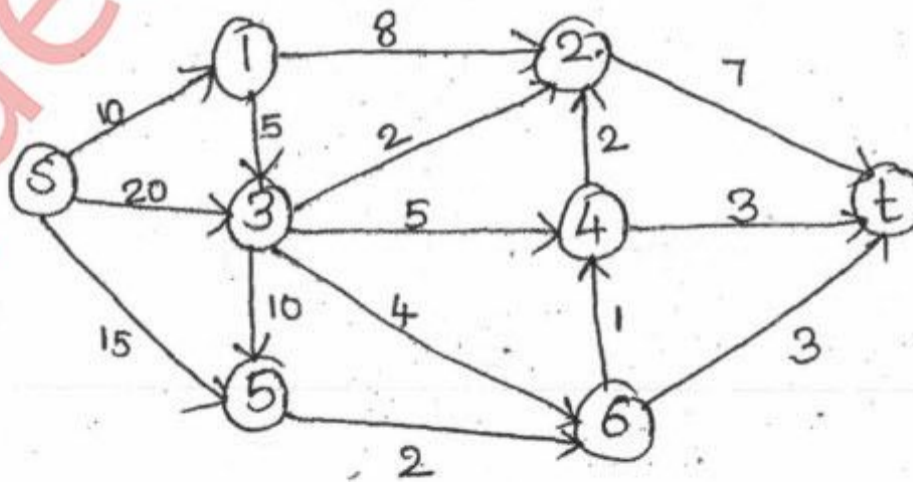
4. (a) What is Minimum Spanning Tree? Draw the MST using Kruskal and Prim's Algorithm and find out the cost with all intermediate steps. 10



- (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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