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Code No: CS1503

GEC-R14

II B. Tech II Semester Regular Examinations, April 2017

## ADVANCED DATA STRUCTURES

(Computer Science and Engineering)

Time: 3 Hours

Max. Marks: 60

**Note:** All Questions from **PART-A** are to be answered at one place.

Answer any **FOUR** questions from **PART-B**. All Questions carry equal Marks.

### PART-A

6 × 2 = 12M

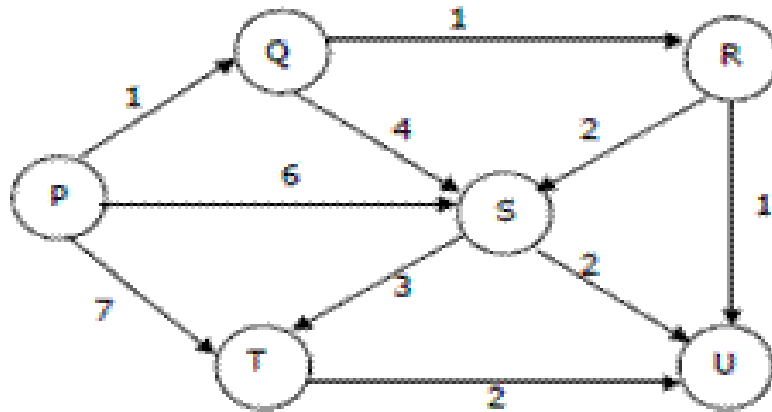
1. What is Double Hashing?
2. What are the properties of heap trees?
3. What are the double rotations in AVL?
4. a) Give any two applications of B<sup>+</sup> tree.  
b) Give the time complexity of B<sup>+</sup> tree search operation.
5. Give any two differences between Prim's and Kruskal's algorithms.
6. Explain Looking-Glass heuristic.

### PART-B

4 × 12 = 48M

1. a) Consider the hash table of size 11 and construct the closed hash table for the input 22, 34, 64, 88, 29, 54, 99 using the hash function  $h(k) = k \text{ mod } m$  and use linear probing for collision resolution. (6M)  
b) Construct the open hash table of size 10 for the input: 84, 75, 104, 31, 39, 95, 66, 27, and 84 using the multiplication method. (6M)
2. a) Differentiate Max Heap tree and Min Heap tree with an example. (6M)  
b) Construct Min Binomial queue with the following elements.  
39, 42, 66, 78, 76, 104, 208, 13, 44, 26, 32, 49. (6M)
3. a) Start with an empty AVL search tree and insert the following elements in the given order. 100, 50, 75, 150, 120, 200, 45, 30. Now delete the nodes 150, 45, 50 and 30. (6M)  
b) Start with an empty splay tree and insert the keys 8, 11, 9, 6, 5, 7, 10. Now delete the nodes 7 and 5. (6M)

4. a) Illustrate with examples Insertion operation on B-tree. (6M)
- b) Start with an empty B<sup>+</sup> tree of order 4 and insert the keys 12, 1, 11, 61, 71, 41, 31, 81, 91, 101 and 111 in this order. Draw the B<sup>+</sup> tree for each insertion. (6M)
5. For the following graph find the shortest paths from vertex P to all destinations, specify each step. (12M)



6. a) Discuss the Knuth Morris Pratt pattern matching algorithm with an example. (6M)
- b) Define Binary trie? Construct a Binary trie for the keys 1001, 0100, 0000, 1111, 0110, 0101, 1110. (6M)

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