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Roll No: _____

3rd Semester

B.Tech. [MC]

Supplementary End Term Examination

Feb 2019

CS-251 Data Structure

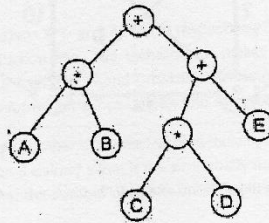
Time: 3hours

Max Marks: 40

NOTE: Attempt any five (5) Questions. Assume suitable missing data, if any.

Q1. (a) A two-dimensional array TABLE [6] [8] is stored in row major order with base address 351. What is the address of TABLE [3] [4]? [2]

(b) Determine the Inorder, Pre order and Post order traversal of the given tree: [3]



(c) Determine how to implement Queue using two stacks? [3]

Q2. (a) Consider the following infix expression and convert it into reverse polish notation using stack: $(A + (B * C - (D / E \wedge F) * G) * H)$. [3]

\wedge is the exponential operator

(b) Compare the complexities in average and worst case of the following sorting: [5]

Merge sort, Heap sort, Quick sort, Bubble sort

Q3. (a) Write an algorithm to find, count, and remove duplicate elements in a queue. Give some applications of queue. [4]

(b) Explain with an example, what is a linked list? Write an algorithm/ program for inserting and deleting a node at a given location in circular linked list. [4]

Q4. (a) Draw a tree with the following information: [5]
Preorder: G, B, Q, A, C, K, F, P, D, E, R, H
Inorder: Q, B, K, C, F, A, G, P, E, D, H, R
Also find the post order of the tree.

(b) Write an algorithm/program for Insertion operation on queue using Singly Linked List [3]

Q5. (a) Compare Binary Tree, Complete Binary Tree, Binary Search Tree and B-tree with the help of an example. [5]

P.T.O

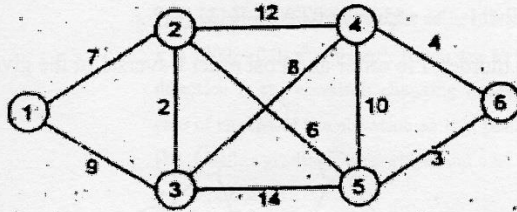
(b) Which are the two standard ways of traversing a graph? Explain with the help of an example. [3]

Q6. (a) What is a Graph? Explain matrix and linked list representation of a graph. Also state the applications of graph. [4]

(b) What is AVLtree? Explain with the help of a suitable example. [4]

Q7. (a) Draw the 11-item hash table resulting from hashing the keys: 12, 44, 13, 88, 23, 94, 11, 39, 20, 16, and 5 using the hash function: $h(i) = (2i+5) \bmod 11$. [3]

(b) What do you mean by Minimum Spanning Tree? Generate Minimum Spanning Tree using Kruskal's algorithm for the following graph: [5]



Q8. Write a short note on: [8]

- (a) Circular Queue
- (b) Hashing and Hash function
- (c) Heap sort
- (d) Threaded Binary Tree

END