B.E.(with Credits)-Regular-Semester 2012-Computer Science and Engineering Sem III

CSE 304 - Data Structures

P. Pages : 2 **GUG/W/16/3696**

Time : Three Hours * 3 6 0 5 * Max. Marks : 80

Notes : 1. All questions carry equal marks.
2. Illustrate your answers wherever necessary with the help of neat sketches.
3. Due credit will be given to neatness and adequate dimensions.
4. Assume suitable data wherever necessary.

1. a) What is data structure? Explain types of data structures with suitable examples. **8**

b) Write a short note on multiple stacks. **8**

OR

2. a) Write an algorithm for insert and delete operation in linear queue. **8**

b) Differentiate between linear Queue and circular Queue. **4**

c) Convert following infix to prefix. **4**

i) $(A+B\uparrow D)/(E-F)+G$

ii) $A*(B+D)/E-F*(G+H/K)$

3. a) Write a function to reverse a singly linked test. **8**

b) Write a program in 'C' to count number of nodes in singly linked test. **8**

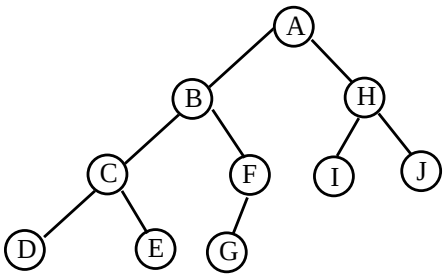
OR

4. a) Write a short note on dynamic Memory allocation. **8**

b) Explain circular linked list and doubly linked list with neat sketch. **8**

5. a) What is Binary search tree? Write a function for insert and search operation in BST. **8**

b) Write C functions for preorder, inorder and postorder. Also write preorder, postorder & inorder for the following tree. **8**

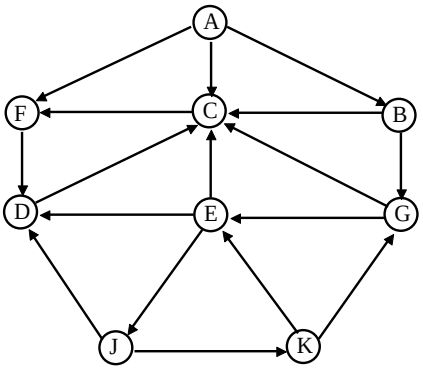


OR

6. a) Write a short note on AVL trees. Explain single rotation and double rotation in AVL trees. **8**

b) What is hashing? Explain the different types of hash functions with example. **8**

7. a) Find the BFS and DFS for the following directed graph **10**



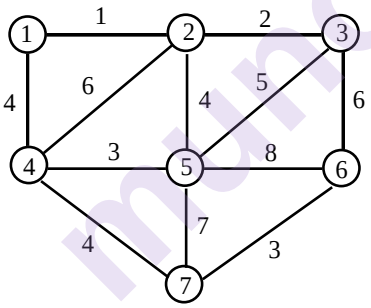
Also write the algorithm for BFS & DFS.

b) Define: **6**

i) Directed Graph
ii) Complete Graph
iii) Weighted Graph

OR

8. a) What is minimum cost spanning tree? Find minimum cost spanning tree using Kruskal's algorithm for the following graph. **8**



b) Explain Hamiltonian path to find shortest distance. **8**

9. a) Sort the following array using bubble sort. Showing all the iterations **8**

11 15 2 13 6

Also write function for bubble sort.

b) Write a C program for insertion sort. **8**

OR

10. a) Write a function for Merge sort. **8**

b) Sort the following array using Quicksort. **8**

65 70 75 80 85 60 55 50 45

Also write the algorithm.

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