(b) What do you understanding by hashing? Consider Inserting the keys 26,37,59,76,65,86 into a Hash table of size m =11. Using linear Probing, consider the primary hash function is h'(k) = k mod m

(c) How an AVL tree differs from BS Tree? Create an AVL Search Tree from the given set of Values.

H, I , J, B, A, E, C, F, D, G, K, L

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Printed pages: 4 **NCS-301**

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 110307

Roll No.

B.Tech

(Sem-III) Spl. Thepry Examination, 2014-15

Data Structure Using C

Time: 3 Hours ***Max. Marks: 100***

Attempt All questions.

1. Attempt any **four** parts of the following: (5 × 4 = 20)

a) How 2-D arrays are represented in memory? Also obtain the formula for calculating the address of any element stored in 3-D array in case of column-major order.

(b) What is a General Tree? Explain a method to convert a general tree into its equivalent binary tree by a suitable example.

(c) What do you mean by sparse matrices? Discuss an efficient method to represent the sparse matrices in computer

(d) Define Abstract data structure. What are the basic operations performed on linear data structure.

(e) Write an algorithm to insert a node any given location in doubly linked list.

(f) Write a C program to find the largest no from array list.

2. Attempt any **two** parts of the following: (10 × 2 = 20)

(a) (i) What is Linked List? How it is different from array?
(ii) What is recursion? Write a C program to solve the Tower of Hanoi Problem.

(b) Write an efficient algorithm which converts in-fix expressions into postfix expressions. Convert the following expression in to pre-fix notations: a b c - + d e – f g – h + / *

(c) (i) Write a C module to interchange the mth & nth element of array list.

(ii) Write a C function to insert an element in a linked list representation of priority queue.

3. Attempt any **two** parts of the following: (10 × 2 = 20)

(a) Write an algorithm for preorder traversal in a tree. Determine the binary tree for the following traversal-

Inorder B,I,D,A,C,G,E,H,F
Postorder I,D,B,G,C,H,F,E,A

(b) What is Huffman Tree? Draw a Huffman tree with Algorithm for following symbol whose frequency of occurrence in a message is stated along with the symbol below:

A:6 B:7 C:12 D:6 E:25 G:4 H:10 J:35 K:15

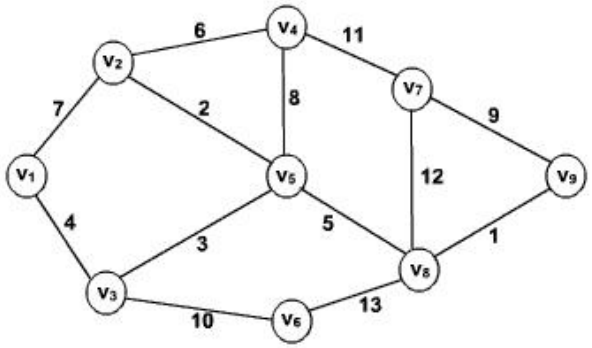
(c) (i) How a node can be deleted from a binary search tree? Explain the methods with example.

(ii) Write a C function to insert a node in a Binary search tree.

4. Attempt any **two** parts of the following: (10 × 2 = 20)

(a) What is a graph? Define simple graph , directed graph, cyclic and acyclic graphs. Explain the linked representation of graphs.

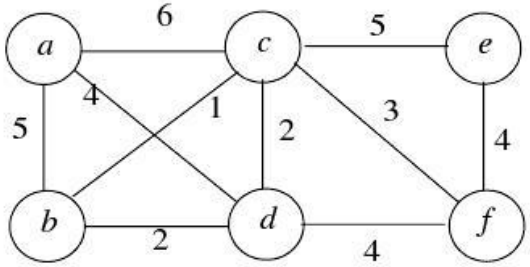
(b) (i) Obtain the minimum Spanning tree for the following graph using Prim's Algorithm.



c

(ii) Write and explain the breadth first search graph traversal algorithm with the help of a suitable example.

(c) Write the Dijkstra's algorithm for single source shortest path. Find the shortest path from node A using the Dijkstra's.



5. Attempt any two parts of the following: (10 × 2 = 20)

(a) (i) Sort the following string using quick sort.

5,12,8,26,7,4,8,18,32,11,

(ii) Write the algorithm for Bubble sort. Explain its worst case complexity.