[Time: Three Hours]   [Marks:100]

Please check whether you have got the right question paper.

N.B: 1)   **Question No. 1 is compulsory.**
        2)   **Attempt any four questions out of remaining six questions.**
        3)   **All questions carry equal marks.**   .

Q.1)   a)   Given the set of symbols and corresponding frequency table as below, explain the steps to find   **10**
Huffman Code

Symbol	A	B	C	D	E	F	G	H	I
Frequency	15	12	10	8	5	7	6	5	5

b)   Write Short notes on   **10**
   i.   Analysis of Algorithm
   ii.   Collision resolution schemes in Hashing

Q.2)   a)   What is a stack? List the application of stack and explain any two in detail?   **10**
      b)   What is a Circular Queue? Give algorithm to insert and display element in a circular queue?   **10**

Q.3)   a)   What is Shell sort? Sort the given data using shell sort   **10**
            23 3 7 13 89 7 66 26 44 18 90 98 57
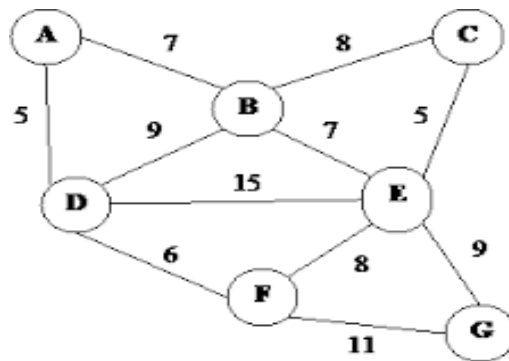   **b)**   Compare Binary Search Tree and AVL Tree? Explain any two rotations in AVL Tree?   **10**

Q.4)   a)   Write algorithms for a Doubly linked list to   **10**
   i.   Display an element
   ii.   Insert an element in the middle of the List
      b)   In order and post order traversal of a binary tree are as follows   **10**
            Inorder: FCEABHDG
            Postorder: FECHGDBA
            Show a step wise reconstruction of the binary tree.

Q.5) a)   Define a B-Tree. Build a B-Tree of order 5 by inserting the following data: **10**
            78, 24, 54, 37, 88, 90, 45, 27, 42, 8, 15, 31, 50
      b)   Explain Graph and its Terminology? Discuss adjacency matrix and adjacency List for Graph   **10**
            Storage?

[TURN OVER]

Q.6) **a)** What is a max heap? Write algorithm to Reheap Up and Reheap Down? **10**

b) Explain with example steps to convert a General Tree to Binary Tree? **10**

Q.7) **a)** Compare Linear Search and Binary Search? Search an element 55 in the list using Binary Search **10**
15 25 35 45 55 65 75 85 95 105

b) Determine the minimum spanning tree of the following graph using Prim's   algorithm. **10**

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