(3 hours)   [80 marks]

NOTE: Question No 1 is compulsory

Attempt any three questions from remain-

ing. Assume suitable data if necessary.

Figure indicate full marks

Q1. A) Define Data structure and Abstract Data Type?   2

B) What do you mean by asymptotic notations? Explain with the help of example.   3

C) What is recursive function? Explain how it works using proper example.   3

D) Define Stack? List the applications of Stack?   3

E) List the properties of Red-Black Tree.   3

F) Define Graph. What are the methods to represent graph.   3

G) What is Linked List? State the advantages of Linked List.   3

Q2. A) Write a program to implement Queue using array.   10

B) Illustrate the deletion operation in a binary heap with examples.   10

Q3. A) Write an algorithm for Quick sort and Merge sort.   10

B) Define AVL Tree? Create an AVL tree using the following sequence

(Mention type of rotation for each case.)- 16,27,9,11,36,54,81,63,72   10

Q4. A) Write a functions to implement insert (), delete () and traverse ()

for singly linked list.   10

B) Write a program to implement a Stack ADT using Linked List?   10

TURN OVER

Q5. A) Find Minimum spanning tree for following graph using Prim's and Kruskal's

Algorithm. Show all the steps.   10
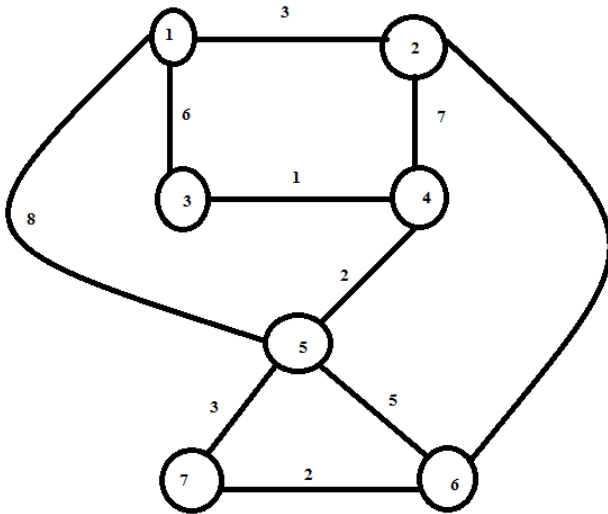
B) From a binary max-heap and min-heap from the following sequence of data-
50,40,35,25,20,27,33   10

Q6. Write Short note (Any Four)   20
   a. Euclid's Algorithm
   b. Huffman tree
   c. Sparse matrix
   d. Breadth First Search Algorithm
   e. Circular Queue
   f. Bubble Sort

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