

QP Code : 25251

Duration 3 hours

Total 80 marks

- N.B: (1) Question No. 1 is compulsory.  
 (2) Attempt any four out of remaining six questions.  
 (3) Assume any necessary data but justify the same.  
 (4) Figures to the right indicate marks.  
 (5) Use of scientific calculator is allowed.

Q1) a) Write an algorithm for Selection sort. Consider the set of 8 numbers as :

10 8 2 5 -1 0 17 9

Show the steps to sort the elements using Selection sort. [10]

b) Define Linked list. Write an algorithm to:

- i) Sort the singly list elements in ascending order  
 ii) Insert an element into the stack [10]

Q2) a) Write an algorithm to implement enqueue and dequeue operation in circular queue. [8]

b) What is heap? Construct max heap tree and apply heap sort for the following values.

10 4 3 2 20 8 12 [7]

Q3) a) What is Binary tree? Given the following traversals, construct a binary tree

Inorder : 4, 7, 2, 1, 5, 3, 6

Preorder : 1, 2, 4, 7, 3, 5, 6 [8]

b) Explain Threaded binary tree. [7]

Q4) a) Define AVL tree. Construct AVL tree for the following data.

35 45 55 1 2 4 12 16 5 [8]

b) Define M-way tree. Construct B tree of order 4 for the following data

10 20 30 5 6 12 40 50 [7]

Q5) a) Define synonyms in hashing list. Using fold shift method and linear probing, store the keys shown below in hashing list of size 100

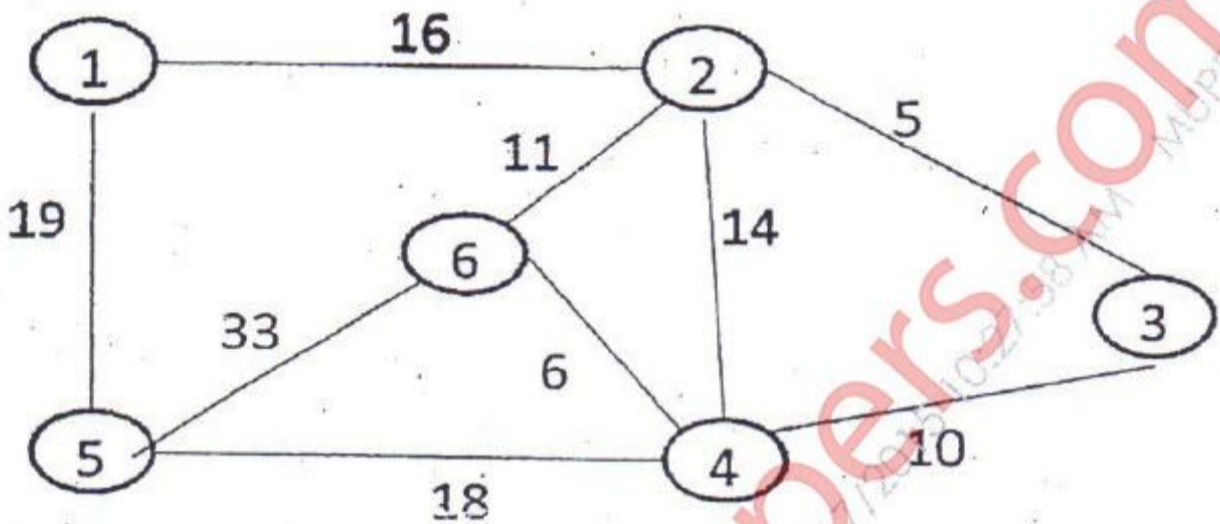
222333, 123789, 239012, 128902, 456789, 907654 [8]

b) Define Graph. Explain Adjacency list and adjacency matrix with the help of an example. [7]

[TURN OVER]

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Q6) a) Define Minimum spanning tree. Give minimum spanning tree using Prim's algorithm for the graph given below: [8]



b) Define Stack. Explain any 2 applications of stack. [7]

Q7) Write short note on any 3 [15]

- Doubly linked list
- Dynamic programming
- Doubly ended queue
- Binary search and sequential search