(3 Hours) **Total Marks: 80**

N.B. (1) Question No. 1 is compulsory.
(2) Attempt any four from the remaining six questions.
(3) Figures to the right indicate full marks.

Q.1 (a) Explain Doubly linked list. Write an algorithm to [10]
I. Create a doubly linked list
II. Delete a particular node

(b) Given the set of symbols and corresponding frequency table as below, explain the steps to create Huffman code [10]

Symbol	A	B	C	D	E	F	G	H	I
Frequency	8	7	5	7	6	2	11	8	9

Q.2 (a) Explain Heap and operations on heap? Write an algorithm for ReHeapdown. [08]

(b) Define binary search tree. Write an algorithm to insert() & search() an element in binary search tree. [07]

Q.3 (a) What is analysis of algorithms? Explain the notations Big O, omega and theta used for analysis of an algorithm [08]

(b) Define Expression tree. Draw the expression tree for the following infix notation and find the prefix and postfix expression for the same. (A-B)/C-D. [07]

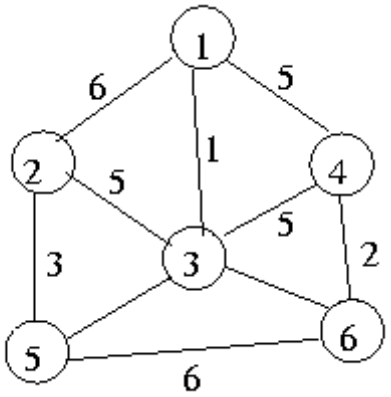
Q.4 (a) Write the recursive pre-order, in-order and post order traversal algorithms for a binary search tree. [08]

(b) What is stack. Write the algorithm for Push() and pop() operation [07]

Q.5 (a) What is graph? Explain Graph Storage structures. Perform depth first traversal on any graph. [08]

(b) What is AVL tree. Write an algorithm to rotateleft() and rotateright(). [07]

Q.6 (a) Give the Prim's algorithm for minimum spanning tree. Write the steps to find minimum spanning tree of the following graph using prim's algorithm. [08]



(b) What is hashing? Using digit extraction method (1st, 3rd and 5th) for hashing and linear probe method for collision resolution; store the keys given below in an array of 19 elements. [07]
224562 , 137456, 214562, 140145, 214576, 162145, 144467, 199645, 234534

Q.7 Write short Notes on: (Any three) [15]

a) Priority Queues
b) General trees
c) linked list
d) B-trees