B.TECH SEM – IV (2007 COURSE) (COMPUTER ENGG.) :
SUMMER - 2018
SUBJECT: ADVANCED DATA STRUCTURES

Day: **Thursday** Time: **10.00 AM TO 01.00 PM**
Date: **07/06/2018** Max. Marks: 80

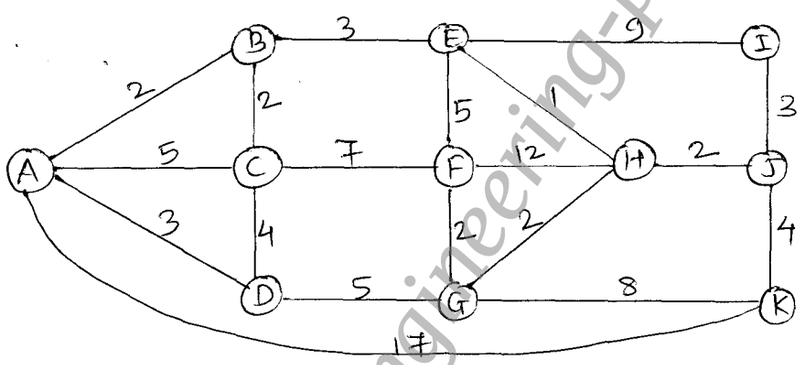
S-2018-2612

N.B.:

1) **Q. No. 1** and **Q. No.5** are **COMPULSORY**. Out of remaining attempt **ANY TWO** questions from each section.
2) Figures to the right indicate **FULL** marks.
3) Answer to both the sections should be written in **SEPARATE** answer book.
4) Assume suitable data, if necessary.
5) Use non-programmable **CALCULATOR** is allowed.

SECTION-I

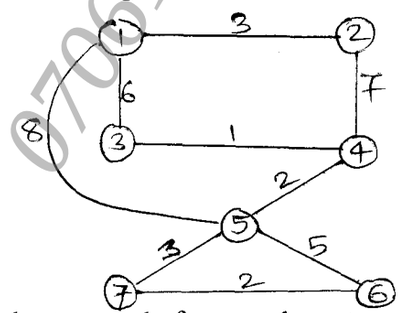
Q. 1 **a)** Define Binary Tree. Describe various methods to represent it. **(05)**
b) Write ADT for AVL tree. **(05)**
c) How following graph is represented using adjacency matrix? **(04)**



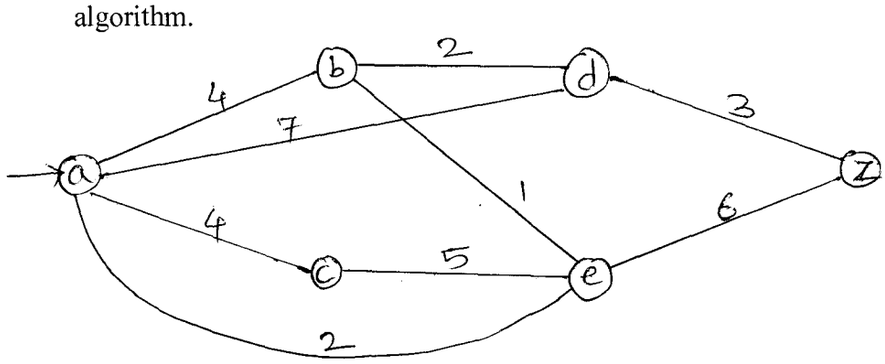
Q. 2 **a)** Construct Binary Search Tree (BST) for following sequence : **(07)**
45,31,155,33,75,195,151,251,40,170 and traverse it using BFT and DFT.
b) How to perform FIFO and LIFO insertion in General Tree? **(06)**

Q. 3 **a)** Explain OBST with example. **(07)**
b) Write an algorithm to delete a node from an AVL tree. **(06)**

Q. 4 **a)** Apply Prim's algorithm to find out MST for the following graph: **(07)**



b) Find shortest path from node **a** to node **z** using Dijkstra's shortest path algorithm. **(06)**



P.T.O.

SECTION-II

Q. 5 **a)** Compare B tree with B+ tree. **(05)**

b) With suitable example discuss Dynamic Programming strategy. **(05)**

c) Explain concept of Index in the context of file. **(04)**

Q. 6 **a)** Write short notes on: **(07)**
a) Static Tree b) Dynamic Tree

b) Explain following with respect to hashing: **(06)**
i) Hash Function ii) Hash Table iii) Collision

Q. 7 **a)** Explain Direct file organization in detail. **(07)**

b) Write C/C++ function to create a record in a file and retrieve it for printing. **(06)**

Q. 8 **a)** Given 05 objects with weights as: **(07)**
(w1 w2 w3 w4 w5) = (3, 6, 14, 5, 11) and profit of objects as (p1, p2, p3, p4, p5) = (12, 13, 15, 10, 14). Solve the 0/1 knapsack problem for maximum profit with maximum weight =15.

b) Explain Backtracking strategy taking 8-Queen's problem as an example. **(06)**

* * * * *