

TH2 Data Structure

Full Marks: 80

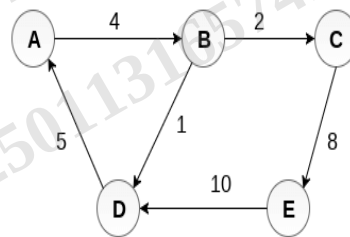
Time- 3 Hrs

Answer any five Questions including Q No.1& 2
 Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. Differentiate linear and nonlinear data structures.
 - b. Write down any two applications of stacks.
 - c. State two advantages of linked list over array?
 - d. Write down the output of following code segment.

```
char str1[20]="ALL THE BEST";
printf("%d\n",strlen(str1));
```
 - e. Define complete binary tree.
 - f. Differentiate between of linear search and binary search.
 - g. Define weighted graph.
 - h. Differentiate between row major order and column major order.
 - i. Define hashing.
 - j. Define recursion.

2. Answer **Any Six** Questions 5 x 6
 - a. Discuss about the best case, worst case and average case complexity.
 - b. Define linked list and its types. Explain how linked list can be represented in memory with suitable example.
 - c. Define collision. Discuss different collision resolution technique.
 - d. Define stack. Write down push and pop algorithms.
 - e. Define tree. Discuss different types of tree traversal algorithms with examples.
 - f. Define array. Write an algorithm for insertion of a new element in an array.
 - g. Construct the adjacency matrix for the weighted graph given below.



Answer **Any Three** Questions

3. List various fundamental file organization techniques and explain each in brief. 10
4. Define BST. Construct a binary search tree with 45, 15, 79, 90, 10, 55, 12, 20 and 50. Write down the inorder and preorder traversal of that BST. 2+4+4
5. Define queue. Write down the algorithm for inserting and deleting an element from a queue. 2+8
6. Explain searching .Write down algorithm for linear search. 10
7. Write short notes on **any four** 2 x 5
 - a) Hashing
 - b) Sparse matrix
 - c) Garbage collection
 - d) BST
 - e) Stack
 - e) Circular queue