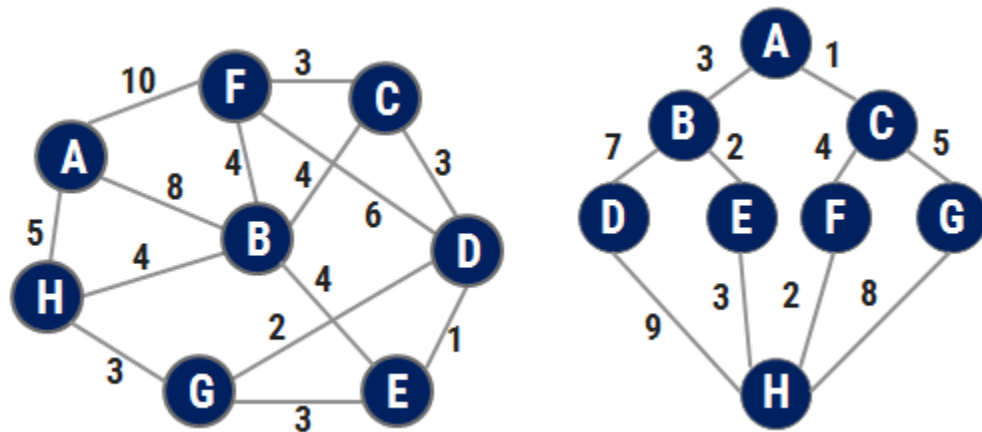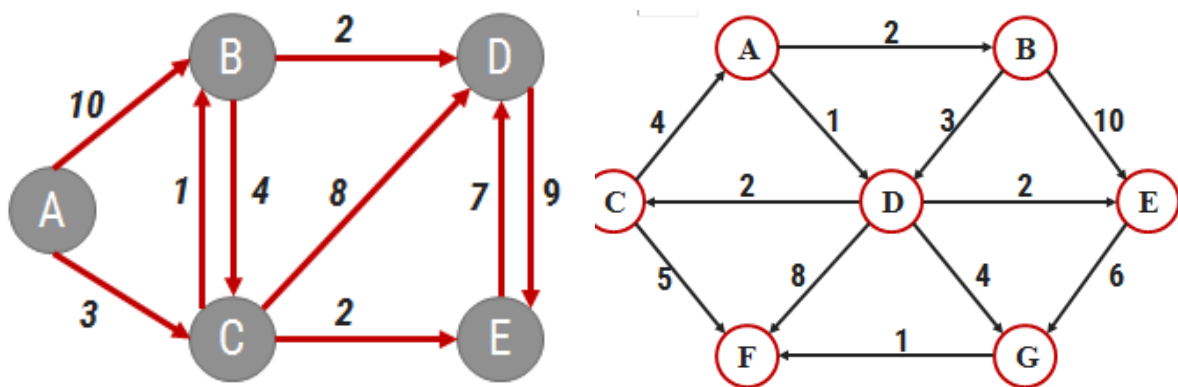# ADA Assignment 5

Submission Date: 02/11/2020

Q.1. Explain Characteristics of Greedy Algorithms

Q.2 Write the Prim's Algorithm to find out Minimum Spanning Tree. Apply the same and find MST for the graph given below.

Q.3. Write Dijkstra's Algorithm for shortest path. Use the algorithm to find the shortest path from the following graph.

Q.4.

We are given 5 objects and the weight carrying capacity of knapsack is $W = 100$.
For each object, weight w_i and value v_i are given in the following table.

Object i	1	2	3	4	5
v_i	20	30	66	40	60
w_i	10	20	30	40	50

Fill the knapsack with given objects such that the total value of knapsack is **maximized.**

Q.5. Solve the example with Activity Selection - Algorithm

Given arrival and departure times of all trains that reach a railway station, find the minimum number of platforms required for the railway station so that no train waits. We are given two arrays which represent arrival and departure times of trains that stop. Arr[ ] = {9:00, 9:40, 9:50, 11:00, 15:00, 18:00} dep[ ] = {9:10, 12:00, 11:20, 11:30, 19:00, 20:00}

Q.6. Solve the example with Job Scheduling with Deadlines – Example

- Using greedy algorithm find an optimal schedule for following jobs with $n=4$.
  Profits: (a, b, c, d) = (20, 10, 40, 30) &

  Deadline: $(d_1, d_2, d_3, d_4) = (4, 1, 1, 1)$

- Using greedy algorithm find an optimal schedule for following jobs with $n=5$.
  Profits: (a, b, c, d, e) = (100, 19, 27, 25, 15) &

  Deadline: $(d_1, d_2, d_3, d_4, d_5) = (2, 1, 2, 1, 3)$

Q.7. Find an optimal Huffman code for the following examples.

- a : 50,   b : 20, c : 15, d : 30.

- Frequency

Characters	A	B	C	D	E	F
Frequency (in thousand)	24	12	10	8	8	5

- Frequency

Characters	a	b	c	d	e	f	g
Frequency (in thousand)	37	28	29	13	30	17	6