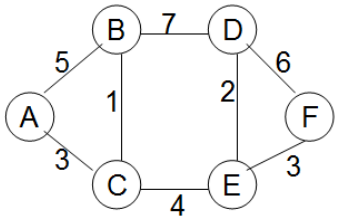
Reading List for Exam 3 (Final Exam): April 26, 2016: 1 PM to 2.50 PM

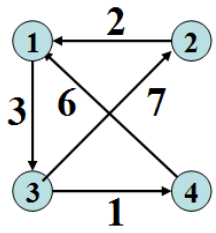
Module 5

1) Given the weighted graph below:



a) Determine the shortest path tree (using Dijkstra algorithm) starting from a particular vertex (say, vertex A)
b) Determine the minimum and maximum spanning trees using Kruskal's algorithm.

2) Given the directed graph below, find the distance matrix and predecessor matrix for "All Pairs Shortest Paths" problem using Floyd's algorithm and deduce the directed path from vertices v2 to v4 and vice-versa. Show the distance matrix and predecessor matrix for each iteration.

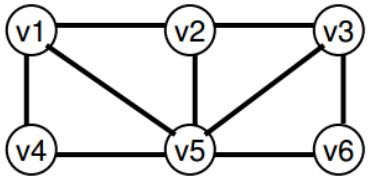


Module 6

3) Given the adjacency weight matrix for a complete graph below, determine approximations to the minimum weight tour using the (a) Nearest Neighbor Heuristic and (b) Twice-Around-the-Tree Heuristic. Also, apply the 2-change heuristic in each case to optimize the tours obtained from the heuristics.

	v1	v2	v3	v4	v5	v6
v1	0	5	3	8	6	4
v2	5	0	5	4	3	2
v3	3	5	0	5	6	7
v4	8	4	5	0	9	5
v5	6	3	6	9	0	6
v6	4	2	7	5	6	0

4) Given the graph below, determine approximations to the maximum independent set, minimum vertex cover and maximum clique using the Minimum Neighbors Heuristic.



5) Given the graph below, find an approximation to the minimum connected dominating set using the degree-based d-MCDS heuristic discussed in class.