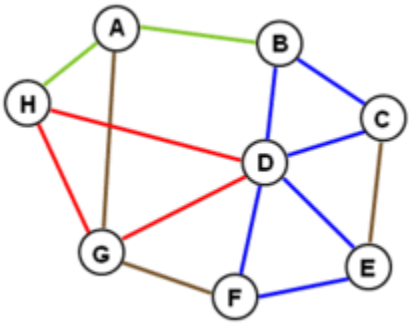
MT 112, Homework #4, Spring 2020 Name _____

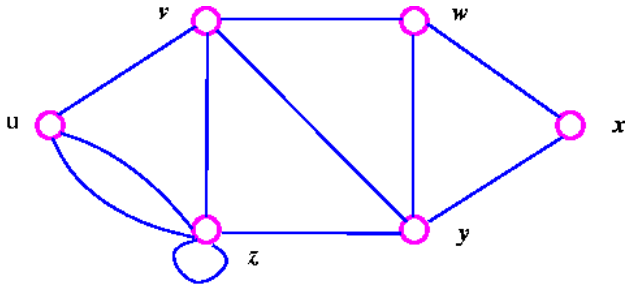
Instructions: Work problems on a separate sheet of paper and attach work to this page. You should show all work to receive full credit for problems. Checking your work with computer algebra systems is fine, but that doesn't count as "work" since you won't be able to use CAS programs on exams or quizzes. Sketch any graphs you obtain. Questions with compact answers can be recorded directly on this page. Graphs and longer answers that won't fit here, indicate which page of the work the answer can be found on and be sure to clearly indicate it on the attached pages.

1. Identify the degree of each vertex.

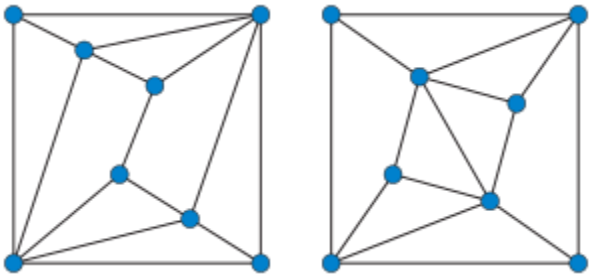
a.



b.

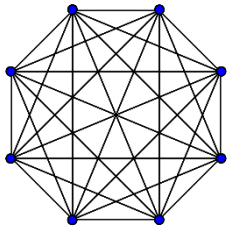


2. Determine if the following graphs are isomorphic. Explain your reasoning.

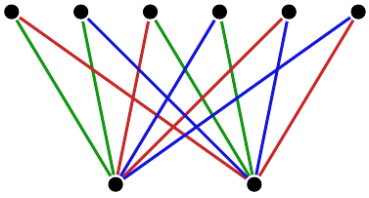


3. Determine if the following graphs are complete, and label the complete graphs with K_n.

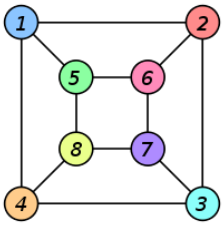
a.



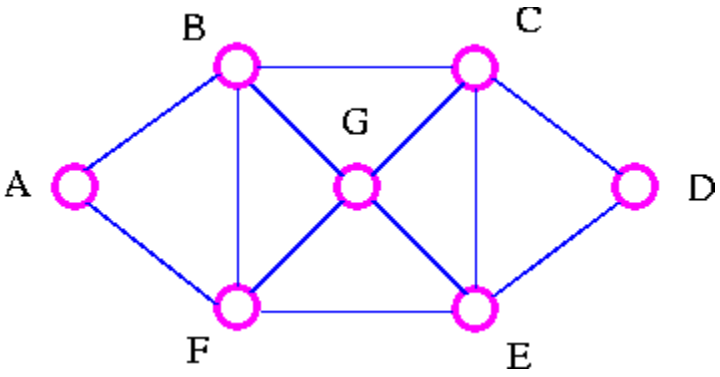
b.



c.

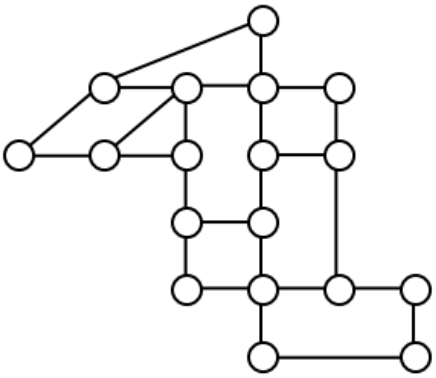


4. Determine if the graph has an Euler circuit. If it does not, does it have an Euler path? If either is the case, find it by numbering the edges of the circuit/path.

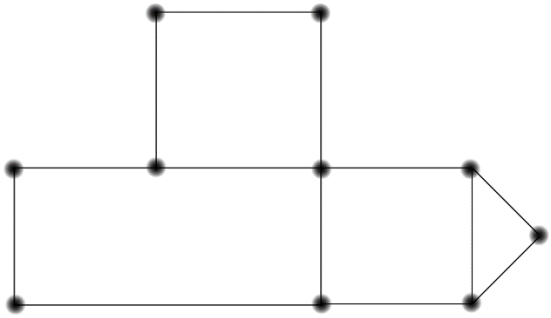


5. Eulerize the graphs below.

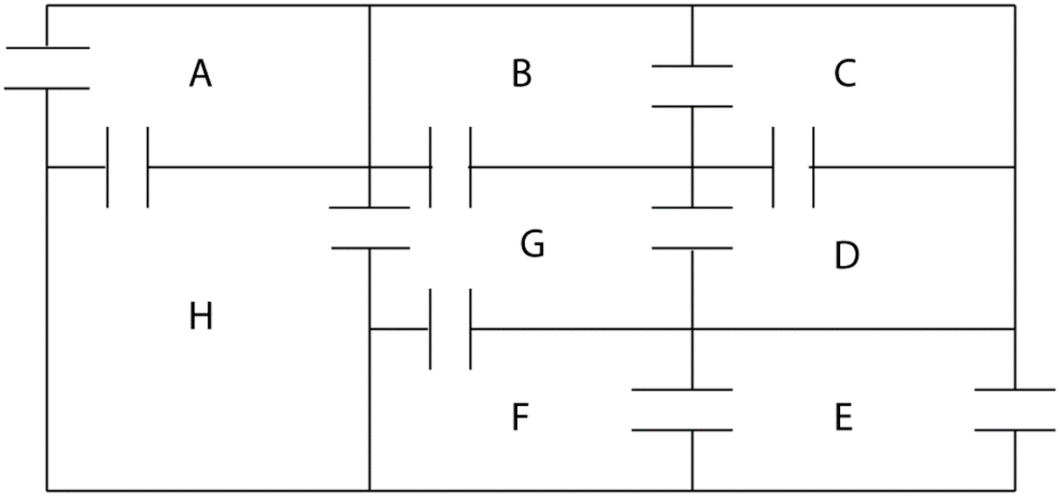
a.



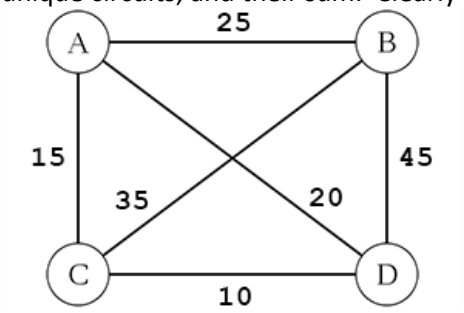
b.



6. Draw a Graph that represents the floor plan below.

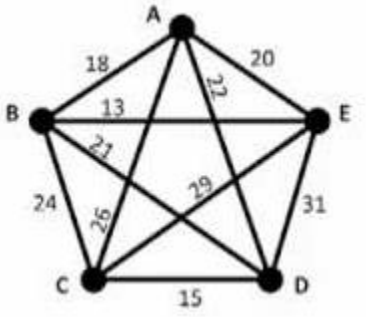


7. Use Brute Force to find the optimal Hamilton circuit for the graph below. Be sure to list all unique circuits, and their sum. Clearly label the least cost graph.

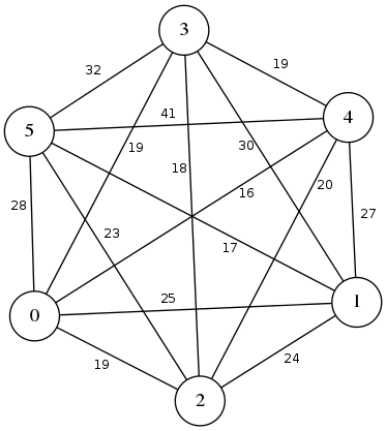


8. Approximate the lowest cost Hamilton circuit using Nearest Neighbor (starting at A or 1), and Cheapest Link. Clearly state the value of the lowest cost circuit in each case.

a.

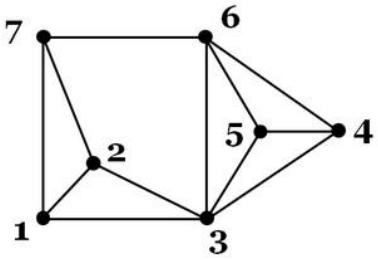


b.

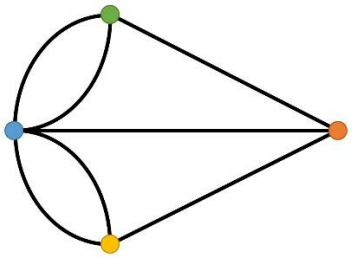


9. Calculate the redundancy of the graphs below.

a.

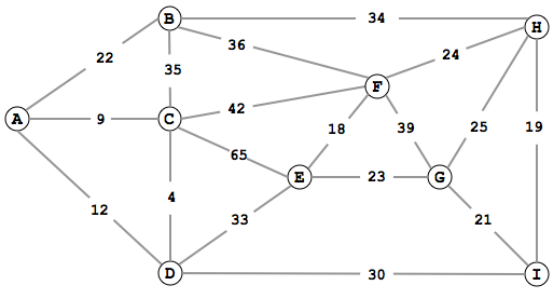


b.

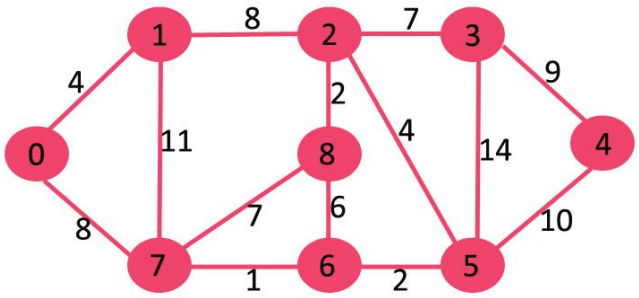


10. Use Kruskal's Algorithm to find the lowest cost spanning tree for the following graphs.

a.



b.



11. A mileage table is shown below. Use Nearest Neighbor starting at Berlin, and Cheapest Link to approximate the lowest cost Hamilton circuit spanning all the listed cities. Clearly state the cost of the final circuit.

Berlin						
652	Brussels					
1315	773	Dublin				
930	319	463	London			
1868	1314	1450	1263	Madrid		
502	602	1375	916	1485	Munich	
877	261	777	341	1053	685	Paris
1182	1171	1882	1431	1361	698	1106 Rome