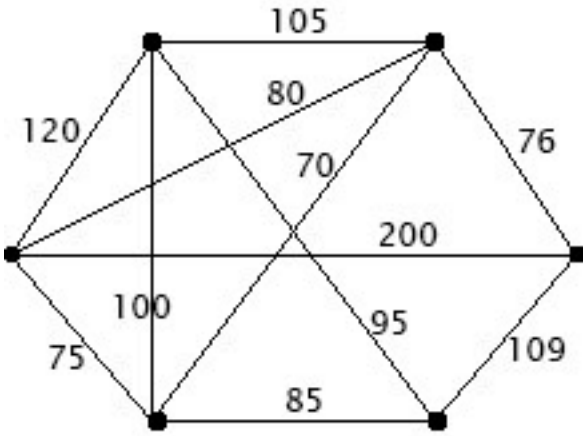
Math 13 – Liberal Arts Math HW 2 (due Thurs, 2/14) Name_____

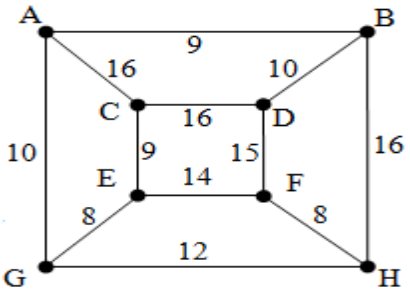
Write all responses on separate paper. Use complete sentences to explain your thinking. Show your work for credit.

1. Construct a complete graph on 6 vertices and use a squiggly line to indicate one possible Hamiltonian circuit for this graph. How many such Hamiltonian circuits are there?

2. Construct a minimal spanning tree of the graph given below




3. Consider the weighted-edge graph shown at right.



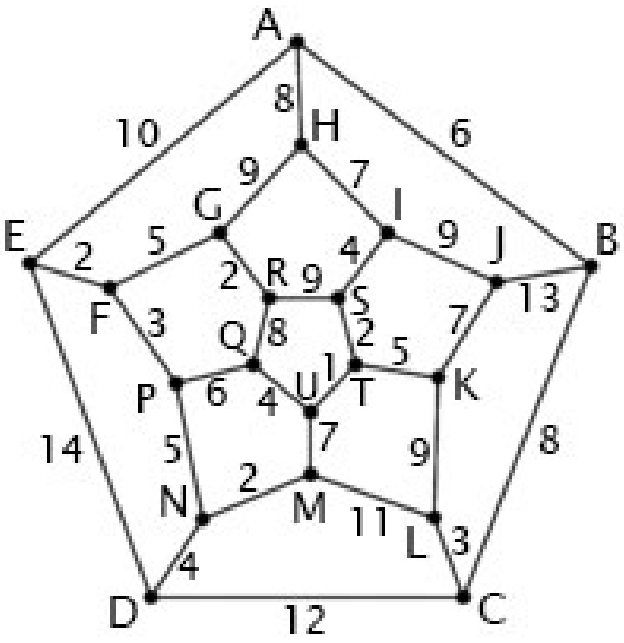

   a. Find the traveling salesman path starting from the upper left vertex and using the nearest neighbor algorithm.

   b. What happens when you try to find the traveling salesman path using the shortest edge algorithm? Explain.

   c. Use brute force to determine the shortest Hamiltonian path.

   d. Find a minimal spanning tree for this graph

4. Consider the weighted-edge graph shown at right.



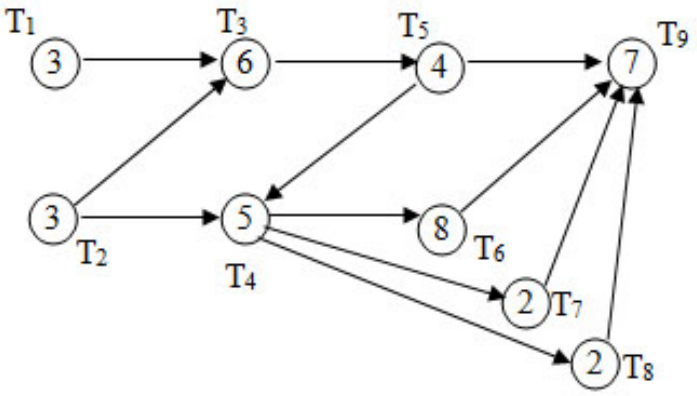

   a. Find the traveling salesman path starting from vertex A and using the nearest neighbor algorithm.

   b. Add additional edges, as needed, to make a complete graph for this graph of 20 vertices. Weight all the new edges at 100. Find the traveling salesman path using the shortest edge algorithm.

   c. Can you find a shorter Hamiltonian circuit?

   d. Find a minimal spanning tree for this graph

5. Given the order requirement digraph shown at right (with times in minutes).




   a. Follow the list processing algorithm to schedule the tasks to two processors the priority list $T_1, T_2, T_3, T_4, T_5, T_6, T_7, T_8, T_9$

   b. What is the critical path for this digraph?

   c. Use the critical path scheduling to prioritize the tasks and then use this priority list to schedule the tasks for two processors.

   d. Is your schedule optimal? If not, how could you improve on it?