BCP / AMDG
Discrete Math

Name: _____
Fall Semester

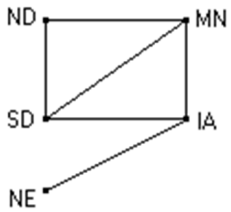
Sample Quiz Questions

More Graph Theory & Algorithms

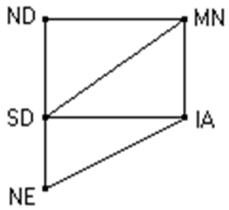
Your answers should reflect concepts that were discussed and/or presented in class. When providing explanations, please use complete and grammatically correct sentences.

1. If vertices represent the states and edges represent borders between states, which of the following graphs accurately represents the map shown at right.

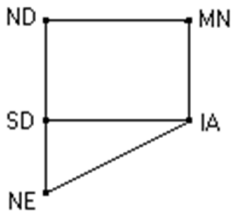
(A)



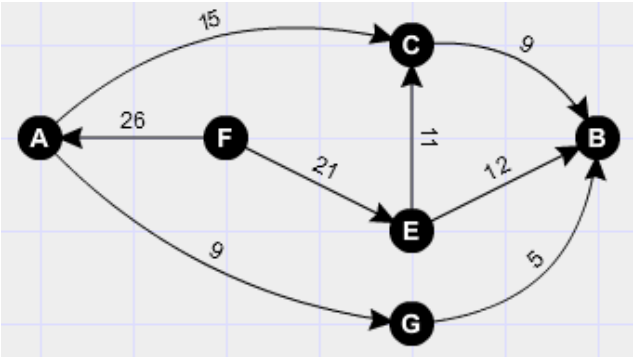
(B)



(C)



Use the graph shown at right to answer #2 through #5.



2. Identify which vertices correspond to the source and sink and explain how you arrived at your answer.

3. Determine the maximum flow along the following path:
   F ➔ E ➔ C ➔ B

4. Explain how you can quickly tell that the maximum flow cannot be greater than 26

5. Determine the maximum flow for the entire graph.

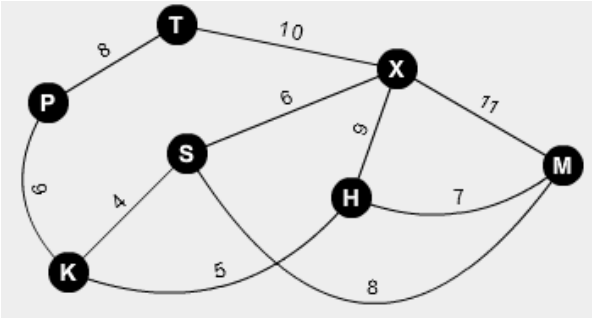
6. Create and explain an algorithm for finding the first 5 prime numbers greater than 100

7. Use the grid shown at right to find the product 517 x 23

5	1	7	
			2
			3

Use the graph shown to the right below to answer #8 through #13.

8. Right now, the graph does not contain an Euler path. But adding a single edge to the graph can change that. Which edge would you add to ensure the graph has an Euler path?



9. Using Dijkstra's Algorithm, construct a spanning tree that shows the minimum travel times from H to all other vertices.

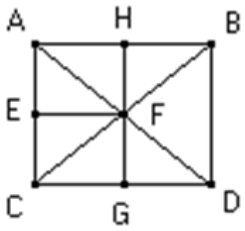
10. Vertices H and T are adjacent. TRUE FALSE

11. The graph is complete. TRUE FALSE

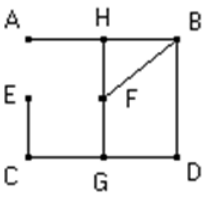
12. The graph is planar. TRUE FALSE

13. Vertex X is a cut vertex. TRUE FALSE

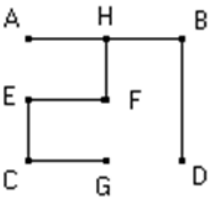
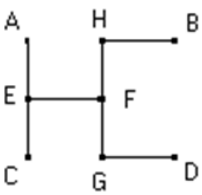
14. Which of the following IS NOT a spanning tree for the graph shown at right.



(A)



(B)



(C)