Graph Theory and Applications
Midterm   31.03.2015

1. What is Menger's Theorem?
   Show what it means on an example graph.

2. If a graph has e edges and n nodes,
a. How many edges would a spanning tree have?
b. How many fundamental circuits would be in a fundamental set of circuits of this graph?
c. How many different circuits can you form from this graph?

3. What is the necessary and sufficient condition for a directed graph to be eularian? Explain what it means.

4. Describe Chinese Postman problem.
   How is it different than finding an Eularian tour?

5. What is a Hamilton cycle?

6. Describe the nearest neighbor method to solve travelling salesman problem.

7. What is the difference between a planar graph and a map?

8. What is genius of a graph?
   What is the genius of $K_{3,3}$? Why?

Points:
Questions 1, 2, 4, and 6: 15
Questions 3, 5, 7, and 8: 10