Tip sheet for the final exam

The final is based on the material covered throughout the term. You will be asked to state and prove one of the following theorems:

1. A graph is bipartite if and only if it has no cycles of odd length.
2. Every walk from u to v contains a path from u to v. Every closed trail has a subwalk that is a cycle.
3. Eulerian graph characterization and the lemma before it (lemma: a graph with minimum degree 2 contains a cycle).
4. The theorem on the characterization of trees (5 equivalent definitions of trees).
5. The correctness of Dijkstra's algorithm.
6. A DFS tree has no cross-edge.
7. If G is a chromatically k-critical graph then no vertex of G has degree less than $k-1$.
8. Brook's Theorem.
9. The five-color theorem.
10. König's Theorem: If G is bipartite then $\chi'(G) = \delta_{\max}(G)$.

Note: The bonus questions of the assignments are not included in the final exam.