Name:

Test 1
Voting Methods and Apportionment
A&S 100
Fall 2002

Objectives.
You should be able to do the following:

1. Determine the winner of a plurality election.

2. Determine the winner of a plurality election with runoff(s).

3. In a plurality election, determine the minimum number of votes a candidate needs to win.

4. In a plurality election in which part of the votes have been counted, determine the minimum number of the remaining votes a candidate needs to win.

5. Recognize that the media often "calls" an election before it is mathematically sound to do so. State an example from American history in which the winner of an election differed from the winner projected by the media.

6. Provide an example in which the winner from the plurality method is different than the winner from the plurality method with a run-off.

7. Discuss the effects of strategic voting on the plurality method.

8. Determine the winner of an election using Borda's method.

9. Discuss the effects of strategic voting on elections determined by Borda's method.

10. Show that $1 + 2 + 3 + \ldots + n = \frac{n(n+1)}{2}$.

11. Determine a formula for the sum of all Borda counts in an election with v voters and c candidates.

12. Determine the Condorcet winner of an election, if one exists.

13. Provide an example of an election in which there is no Condorcet winner.

14. Recognize the role of single peaked preference rankings in determining a Condorcet winner.

15. Determine the winner of an election using the approval voting method.

16. Compare and contrast the plurality method, the plurality method with runoff(s), Borda's method, the head-to-head comparison method, and the approval voting method in determining the winner of an election. List pros and cons of using these five different methods to determine a winner of an election.

17. Define universal domain, Pareto optimality, nondictatorship, and independence from irrelevant alternatives.

18. State Arrow's Impossibility Theorem.

19. Define anonymity and neutrality.

20. Discuss

    (a) The Plurality Method,
    (b) The Plurality Method with Runoff(s),
    (c) Borda's Method,
    (d) Head-to-Head comparison Methods, and
    (e) The Approval Voting Method

    with respect to universal domain, Pareto optimality, non-dictatorship, independence from irrelevant alternatives, anonymity, and neutrality.

21. Apportion the seats of a house using:

    (a) Hamilton's Method
    (b) Lowndes' Method
    (c) Jefferson's Method
    (d) Webster's Method

22. Recognize that Hamilton's method and Lowndes' method are quota methods.

23. Recognize that Jefferson's method and Webster's method are divisor methods.

24. Find threshold divisors for Jefferson's and Webster's methods. Use these threshold divisors to find an appropriate divisor for these methods.

25. Compare and contrast Hamilton's, Lowndes', Jefferson's, and Webster's, methods of apportionment. Which methods favor smaller states? Which methods favor larger states?