Exam #1 topics & sample questions

Ranked voting

1. Here is an example election:

3	2	2	2
A	C	B	C
B	B	A	B
C	A	C	A

   Compute the winner using:

   i) Plurality

   ii) Borda count

   iii) Condorcet's method

   iv) Ranked choice

   v) Dictatorship, assuming the dictator is in the right-most column.

2. Be familiar with the big chart, and be able to explain any spots where there is a check mark. For example: explain why Borda satisfies monotonicity.

3. Be able to give examples showing why some spots in the big chart have a X mark. For example, create an example showing that plurality does not satisfy the Condorcet Winner Criterion.

4. Understand the difference between various criteria involving changing votes– exactly what kind of changes are important when discussing monotonicity, IIA, manipulability?

5. Understand approval voting and the random dictator method.

Weighted voting

6. In this weighted voting system $[15 : 8, 5, 3, 3, 1]$:

   i) Are there any dictators?

   ii) Are there any voters with veto power?

   iii) Are there any dummies?

7. In this weighted voting system: $[15 : 12, 4, 3]$, compute the Shapley-Shubik power index.

Answers!

1. (a) C, (b) B, (c) B, (d) A, (e) C

2. Borda satisfies monotonicity: Imagine that X is the winner using Borda. If I boost X on some ballots, then X will receive even more points, and everybody else's points will either stay the same or decrease. Thus X will still win.

3. The example in #1 is one showing that plurality does not satisfy CWC.

6. (a) No: this would require somebody's vote to be 15 or more.

   (b) Yes: the 8 has veto power because there is no way to reach 15 unless we include the 8. The 5 does not have veto power, because we can get to 15 without the 5, like $8+3+3+1=15$. Similarly the 3, 3, and 1 do not have veto power.

   (c) No: even the 1 can have an impact in some cases. For example we can do $8+3+3+1=15$, and the 1 is important in this combination, so it is not a dummy.

7. A: 4/6, B: 1/6, C: 1/6