1. Several political scientists and economists have documented a condition of “logrolling” in Congress, in which members of Congress trade votes on one bill for votes on another. Consider the following net benefits (measured in billions of dollars) that will result from the passage of two legislative bills, X and Y:

<table>
<thead>
<tr>
<th>Voter</th>
<th>Issue X</th>
<th>Issue Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>6</td>
<td>-3</td>
</tr>
<tr>
<td>B</td>
<td>-1</td>
<td>5</td>
</tr>
<tr>
<td>C</td>
<td>-2</td>
<td>-3</td>
</tr>
</tbody>
</table>

a) Identify the logrolling opportunity present in this situation.
b) Identify the potential gains to voters.
c) Explain to what extent logrolling is or is not efficient enhancing here.

Ans:

(a) On their own, neither issue X nor Y will pass. Both will be voted down by votes of 2-1. If person A trades a vote with B, then both issues will pass by 2-1 votes.
(b) With both issues passed, overall utility for person A is 3. For person B, overall utility is 4. For person C, overall utility is –5.
(c) With issue X passed, society is benefited because it had a total benefit to society of 3. However, logrolling also allowed issue Y to pass, though it shouldn’t have since its total benefit to society is –1.

2. Suppose there were three candidates running for office: Dewey, Cheatum, and Howe. Suppose a majority of voters preferred Cheatum to Dewey. Does this mean that a majority of voters preferred Howe to Dewey?

Ans: Suppose there are three voters. The following example illustrates the counter-example. Each voter ranks the candidates in order of preference. Cheatum beats Dewey, but Dewey beats Howe.

<table>
<thead>
<tr>
<th>Candidate</th>
<th>Voter</th>
<th>Dewey</th>
<th>Cheatum</th>
<th>Howe</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

3. What is the difference between requiring P-transitivity in the social ranking and acyclicity in the social ranking?
Ans: Acyclicity is weaker. With P-transitivity you require that IF xPy and yPz, THEN IT MUST BE THAT xPz. With acyclicity all you need is that IF xPy and yPz THEN it is not the case that zPx. So you could have zIx and that would be ok with acyclicity but NOT ok with P-transitivity.

4. Why is the United Nations Security Council NOT an oligarchy?

Ans: Because, even if ALL the members of the UNSC prefer x to y, unless there are at least 4 other counties that agree that xPy, the UNSC can not impose its strict preference on the whole.

5. What is the relationship between an oligarchy and the rule of consensus?

Ans: The rule of consensus is an oligarchy of the whole, that is everyone in the group is in the oligarchy. Note, an oligarchy on 1 person is a dictator.

6. A Borda count is used to decide an election between 3 candidates, x, y, and z, where a score of 1 is awarded to a first choice, 2 to a second choice, and 3 to a third choice. There are 29 voters. 10 voters rank the candidates x first, y second, and z third; 3 voters rank the candidates x first, z second, and y third; 8 voters rank the candidates z first, y second, and x third; 8 voters rank the candidates y first, z second, and x third. Which candidate wins?

Ans: Candidate y.

7. No one is meaner and uglier than Gladys. Someone is meaner and uglier than Harold. Therefore Gladys is meaner and uglier than Harold. Is this reasoning correct? If so, explain why. If not, explain why not. (Assume that people can be ranked from ugliest to least ugly by a complete transitive ordering and that there are no ties. Likewise assume that people can be ranked from meanest to least mean by a complete transitive ordering and that there are no ties.)

Ans: The reasoning is incorrect. Consider the following example. There are 3 people: Fred, Gladys and Harold. The rankings for ugly are Gladys is ugliest, Fred is second ugliest and Harold is least ugly. The rankings for mean are Fred is meanest, Harold is second meanest and Gladys is least mean. Then nobody is meaner and uglier than Gladys. Fred is meaner and uglier than Harold, but Gladys is not meaner and uglier than Harold.
8. Suppose Abe, Betty, Charlie, Dave and Ed have the following preferences over days of the week for the next review session: (M=Monday, W=Wednesday, F=Friday)

<table>
<thead>
<tr>
<th></th>
<th>ABE</th>
<th>BETTY</th>
<th>CHARLIE</th>
<th>DAVE</th>
<th>ED</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>W</td>
<td>F</td>
<td>M</td>
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<td>W</td>
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<td>W</td>
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<tr>
<td>F</td>
<td>M</td>
<td>W</td>
<td>F</td>
<td>F</td>
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</tbody>
</table>

a) Is the profile for this class “society” single peaked? Defend in words or with a diagram.
b) What would happen if we used the method of majority voting over each pair of alternatives to determine the social ordering?
c) Now instead of using majority voting, suppose we designate that Charlie will be an inverse-dictator. How must "society" rank F relative to M, M relative to W, and F relative to W if Charlie is an inverse-dictator?
d) What Arrow axiom is not guaranteed with an inverse-dictator rule?
e) Is the axiom you mentioned above violated by the Charlie inverse-dictator rule given the particular preference profile illustrated in the table? Defend/explain your answer.
f) What are the other 4 Arrow axioms?

**Ans:**
(a) Not single peaked…. Betty and Charlie along with the Abe/Dave/Ed group give you the standard Cordorcet preferences.
(b) We would get M P W, M P F and W P F (basically the Abe/Dave/Ed group rules.
(c) Then we get, from best to least for society, W then M then F.
(d) We are not guaranteed the Pareto Principle.
(e) No it is not here, since there is not a pair of alternative for which x P y, unanimously.
(f) Collective Rationality, Pairwise Determination, Universal Scope, No Dictatorial (make sure you read the Blair Pollak paper on this).

9. In 1998, the people of Puerto Rico held a referendum in which there were five choices – 1) retain commonwealth status, 2) become a state, 3) become independent, 4) “free association” (a type of independence that would delegate certain powers to the United States), and 5) “none of the above.” What kind of problems might arise when people vote over five options?

**Ans:** When there is a vote over five options, there is the chance that a potential majority vote is split between four relatively preferred options, and the fifth option wins. The winning option may have been voted down if it had been a two-way vote with any of the other options. Further, if preferences are not single-peaked, cycling and inconsistent public decisions may emerge.
10. In 2005, Kuwaiti women won the right to vote in parliamentary elections. Indeed, women voters now outnumber men voters in Kuwait because women are automatically registered while men have to register on their own. One woman noted, “The Ministers of Parliament used to vote against us; now they are wooing us to vote for them”. What does this tell us about the validity of the predictions of the median voter theorem?

Ans: Assuming that the preferences of Kuwaiti women differ from the preferences of Kuwaiti men, stronger voter turnout by women could invalidate the median voter theorem. That is, the results of majority voting would not reflect the preferences of the median voter.