

**PS 2703: Formal Political Theory**  
**September 10, 2007**

Practice Problems: Social Choice

1. Suppose the set of alternatives is  $X = \{a,b,c,d,e\}$  and that there are five voters with the individual preference orderings shown below.

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
a	b	e	a	d
b	a	d	b	c
c	c	b	d	b
d	e	a	c	e
e	d	c	e	a

- a. Consider the pairwise social preference determined by simple majority rule. What are the social preference relations for each pair of alternatives? Identify a preference cycle if there is one. What is the core?
- b. Now consider the super-majority rule such that  $xPy$  if and only if at least 4 voters have  $xP_iy$ . In this case, what are the social preference orderings? Is the 4/5ths majority rule transitive? What is the core?
- c. Using the Borda Count as the preference aggregation rule, what are social preferences? What is the core?

2. Let  $X = \{a,c,b,d,e,f,g,h\}$  and let  $N = \{1,2,3\}$  with the following preferences:

<u>1</u>	<u>2</u>	<u>3</u>
a	e	h
b	d	g
c	c	f
d	f	e
e	g	d
f	h	c
g	b	b
h	a	a

- a. Are these preferences single-peaked?
- b. Are they transitive?
- c. What is the majority rule core?

3. Plot the set of alternatives that a simple majority prefers to  $\phi_1$  and  $\phi_2$ . (Use the first figure for the “winset” of  $\phi_1$  and the second figure for  $\phi_2$ .)

