Instructions: This is a 20-minute quiz consisting of short answer questions. Give enough justification so that I can tell what you were thinking if you make a mistake. The quiz is worth 50 points.

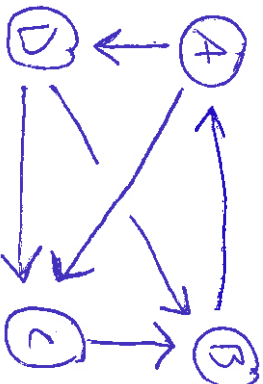**1. Consider the following preference system:**

6	5	3	7
A	B	B	C
B	A	C	A
C	C	A	B

(a) Who is the plurality winner?   B — 8votes

(b) Is there a Condorcet winner? Yes   If so, who? A

(c) Who is the Borda winner?   A

2. Consider the following preference system:

9	2	4	6
A	B	D	C
D	A	C	B
C	D	B	D
B	C	A	A

(a) Draw the preference graph for these votes:

(b) What ordering of sequential votes allows option C to win? A D B C or DABC

First comparison: A→D   Second comparison: B→A   Third comparison: C→B

(c) Select (non-negative) Borda weights so that option D is the winner:

First place: 10   Second place: 9   Third place: 1   Fourth place: 0

Lots of possible choices here!

3. Use **IESDS** on the following matrix to determine the possible equilibria:

③

2,1	3,0	5,-3	7,-5
-4,7	-5,0	6,-4	1,6
-5,-1	0,5	2,-5	-1,-3
-4,5	0,-3	-1,4	7,-5

① For Player 2 the third & fourth
② Columns are Dominated by column 1.

Then, for Player 1 the top
② Column Dominates all the lower
ones,

③ Finally, for Player 2 (3,0)
is Preferable to (2,-1)

4. Find the Nash equilibria for the following game:

0,0	1,1	2,2	4,4
-3,2	-1,4	5,1	3,3
1,3	8,22	2,5	1,1
4,4	6,40	3,1	-1,-1

③

(4,4)   (3,22)

5. When we discussed the game of **Chicken** in class, we noted that "choosing" to go first by announcing your intention could improve your expected outcome in the game. Circle the game below in which player 1 would like to play first. Why?

5,-5	3,4
3,2	-1,5

2,4	-1,3
-5,0	4,6

In the top game there is a unique
Nash equilibrium (3,4), so the first
Player doesn't improve their outcome by
Playing first. On the other hand, the lower
game has two nash equilibria and
Player 1 can get the better outcome
of (4,6) by announcing that they
will play the bottom row.