Microeconomic Theory Final Exam — Fall 2012

Exam Time: 1/10 9:10am-12:10pm. You have 3 hours; allocate your time wisely.

Part A (25%): The Pitching Game

Hong-Chi Kuo can pitch fast balls to the Center, Inside or Outside, but he can use his secret weapon, the Slider. Below is the payoff matrix of him facing a batter:

	Hit Center	Hit Inside	Hit Outside	Hit Slider	O'Neill data
Center Pitch	-5, 5	5, -5	5, -5	-5, 5	.221
Inside Pitch	5, -5	-5, 5	5, -5	-5, 5	.215
Outside Corner	5, -5	5, -5	-5, 5	-5, 5	.203
Slider	-5, 5	-5, 5	-5, 5	5, -5	.362
O'Neill data	.226	.179	.169	.426	

1. (3%) Do any of the players have a dominant strategy? Why or why not?
2. (6%) Does this game have a pure strategy N.E.? If yes, solve for the pure strategy N.E.; if not, find the completely mixed strategy N.E. of the game.
3. (3%) Find all other N.E. of this game. (Hint: You should not spend all your time on a question that is worth only 3 points!)
4. (5%) Show that under expected utility theory, both risk-neutral and risk-averse players will behave the same. In particular, show that the payoff matrices of the two are identical up to a linear transformation.
5. (3%) Explain why this game is strategically equivalent to O'Neill (1987)'s joker game.
6. (5%) Does actual frequency of play in O'Neill (1987) match any of your equilibrium predictions? Why or why not?

Part B (20%): The Confession Game

Two nerdy guys are seeing the same girl. They each have a probability of 0.8 to be Acceptable; 0.2 to be Disliked. They can only see whether the other person is Acceptable or Disliked, and are commonly told that at least one of them is Acceptable. Both agents choose Wait or Confess (reveals his love to the girl and learns if he is Acceptable or Disliked) simultaneously. If nobody chooses Confess, they will observe the other person's choice and choose again. Consider:

1. (4%) The case where one of them is Acceptable, and the other is Confess. What would the S.P.N.E. outcome be in the first period?

2. (8%) The case where both players are Acceptable. What would the S.P.N.E. outcome be in the first period? Second Period?
3. (8%) What do you think would happen when real people play the games described in case 1 and 2, say, as in Weber (2001)?

		Type	
		Acceptable	Disliked
Probability		0.8	0.2
Action	Wait	0	0
	Confess	1	-5

Part C (30%): Guanxi Lobbying

Consider the following game played between a governmental official and a lobby group. The group might have guanxi (ties/relations) with the Supreme Leader or not. With probability $p=1/3$, the group is backed by the Supreme Leader (**Guanxi**), and with probability ($1\text{-}p=2/3$), the group is not (**None**). The governmental official has to decide whether to **Grant** the request of the lobby group, or **Ignore** it. Before making the decision, he can observe whether the lobby group **Host** a cocktail party at the Capital. The payoff table is:

Ties/Relations	**Didn't Host** Party		**Host** Party	
	Ignore	**Grant**	**Ignore**	**Grant**
None ($1\text{-}p=2/3$)	0, $b_1=2$	$a_1=2$, 0	$-c=-0.5$, $b_1=2$	$a_1-c=1.5$, 0
Guanxi ($p=1/3$)	0, 0	$a_2=6$, $b_2=1$	$-c=-0.5$, 0	$a_2-c=5.5$, $b_2=1$

1. (2%) Show that $\beta = \dfrac{pb_2}{(1-p)b_1} < 1$.
2. (8%) Show that there is a pooling equilibrium in which both types of lobby groups **Didn't** host cocktail parties, and officials **Ignore** the request.
3. (10%) Show that there is also a semi-pooling equilibrium in which **Guanxi** lobby groups always **Host**, **None** lobby groups **Host** with $p=0.25$, and governmental officials **Grant** the requests with probability $c/a_1=0.25$.
4. (6%) Are these two equilibria trembling-hand perfect? Why or why not?
5. (4%) Potters and van Winden (1996)'s experiments saw **Guanxi** (**None**) lobby groups **Host** 76% (38%) of the time, and officials **Grant** requests 5% (2%) to groups who **Host** (**Didn't**). Does this data match any of the above equilibrium? Why or why not?

Part D (25%): Other-Regarding Preferences and Welfare Theorems

$$u_1(x_1, x_2) = x_1 + kx_2, 0 < k < 1$$
$$u_2(x_1, x_2) = x_2 - \alpha \max\{x_1 - x_2, 0\} - \beta \max\{x_2 - x_1, 0\}, 0 < \beta < 1,\ \alpha > \beta$$

1. (4%) Draw the indifference curves of the two utility functions assuming:

$$\frac{\beta}{1-\beta} > \frac{1}{k} \quad \text{or} \quad \frac{1}{k+1} < \beta < \alpha$$

(Hint: If you really do not know how to draw this, you may proceed by forfeiting the points and ask the TA to provide the correct graphs.)

2. Consider a 2x2 exchange economy with Alex and Bev:

$$u_A = u_1(x_1^A, x_2^A) = x_1^A + kx_2^A$$
$$u^B = u_2(x_1^B, x_2^B) = x_2^B - \alpha \max\{x_1^B - x_2^B, 0\} - \beta \max\{x_2^B - x_1^B, 0\},$$
$$x_1^A + x_1^B = \overline{x}_1,\ x_2^A + x_2^B = \overline{x}_2,\ \overline{x}_1 > \overline{x}_2$$

a. (8%) What are the Pareto efficient allocations (PEA)? In particular, is "Alex consuming everything" Pareto efficient? Is "Bev consuming everything" Pareto efficient? Why or why not?

b. (6%) If Alex's endowment $\omega_1^A + k\omega_2^A \geq \overline{x}_1 - \overline{x}_2$, what is the Walrasian equilibrium (WE)? Is the WE allocation a PEA?

c. (4%) If Alex's endowment $I^A = P_1\omega_1^A + P_2\omega_2^A < P_1(\overline{x}_1 - \overline{x}_2)$, show that there does not exist any WE.

d. (3%) Do the first and second welfare theorems hold in this exchange economy? Why or why not?