Economics 504: Final Exam, Spring 2010

The exam is open book, notes and calculator, but no cell phones, laptops or other communication devices. You have three hours. There are four questions. Each question has equal weight and you should do all four questions.

1. Consider the allocation of two distinct indivisible objects A and B to three agents. Each agent can consume only A, only B, both A and B, or nothing. The types of each agent is given by $\Theta_i = \{(v_A, v_B, v_{AB}) \in \mathbb{R}^3_+ \mid v_A, v_B \leq v_{AB}\}$ where v_A denotes her valuation for only A, v_B denotes her valuation for only B, and v_{AB} denotes her valuation for both A and B. The valuation for no consumption is zero. Find the allocation of the two objects and the transfers according to the pivotal VCG mechanism at the following three type profiles.

(a)

	θ_1	θ_2	θ_3
v_A	5	1	0
v_B	1	4	3
v_{AB}	5	7	8

(b)

	θ_1	θ_2	θ_3
v_A	3	2	2
v_B	3	0	2
v_{AB}	3	5	6

(c)

	θ_1	θ_2	θ_3
v_A	5	0	0
v_B	0	5	0
v_{AB}	5	5	4

2. Prove that expected utility theory satisfies the independence axiom.

3. Construct a three player centipede game in which there is self-confirming equilibrium such that the equilibrium path includes an outcome that cannot occur in any Nash equilibrium.

4. Consider a game between a long-run and short-run player with payoffs

		Short-run	
		out	in
Long-run	nice	0,0	4,4
	mean	0,0	6,-2

First for the stage game

a. Find all Nash equilibria, the pure and mixed Stackelberg strategies and payoff, and the minmax for long-run player.

b. What is the worst dynamic equilibrium as a function of the discount factor of the long-run player?

c. What is the best dynamic equilibrium as a function of the discount factor of the long-run player?

d. What happens if there is a positive probability of a "type" of long-run player who will play "nice" no matter what?

Now suppose that there is moral hazard, so that the short-run players do not observe whether the long-run player played A or B, but only a noisy signal $y \in \{N, M\}$ where $pr(N \mid Nice) = pr(M \mid Mean) = p > 1/2$.

e. What is the worst dynamic equilibrium as a function of the discount factor of the long-run player and p?

f. What is the best dynamic equilibrium as a function of the discount factor of the long-run player and p.

g. Is moral hazard good or bad?