Written Exam for the B.Sc. or M.Sc. in Economics summer 2014

Microeconomics C

Final Exam

June 13, 2014

(2-hour closed book exam)

Please note that the language used in your exam paper must correspond to the language of the title for which you registered during exam registration. I.e. if you registered for the English title of the course, you must write your exam paper in English. Likewise, if you registered for the Danish title of the course or if you registered for the English title which was followed by “eksamen på dansk” in brackets, you must write your exam paper in Danish.

This exam question consists of 3 pages in total (including this page).

1. Consider the following game G, where Player 1 chooses the row and Player 2 simultaneously chooses the column.

		Player 2		
		D	E	F
	A	$3, 5$	$3, 4$	$4, 2$
Player 1	B	$2, 3$	$x, 4$	$3, 2$
	C	$1, 2$	$1, 1$	$1, 5$

   (a) Is G a static game or a dynamic game?

   (b) Suppose $x = 4$. Find all Nash equilibria (pure and mixed) in G.

   (c) Suppose $x = 2$. Find a Nash equilibrium in G and prove that it is unique. Make sure to explain your reasoning (2-3 sentences).

2. Consider a market for pies with 2 bakers. Bakers i and j follow the same recipe, and are highly skilled at pie-making, so they both produce identical pies at zero marginal cost. They simultaneously and independently set prices p_i and p_j. Demand for baker i is 0 whenever $p_i > 1$. For any price $p_i \leq 1$, demand for baker i is $q_i = D$ when $p_i < p_j$ and $q_i = D/2$ when $p_i = p_j$, where $D > 0$ is a strictly positive constant. In words, the baker with the lowest price serves the entire market, but demand drops to zero when the price exceeds 1. Profits for baker i are $\pi_i = p_i q_i$.

   In this question, you only have to consider symmetric equilibria, where both bakers set the same price, and earn the same profits.

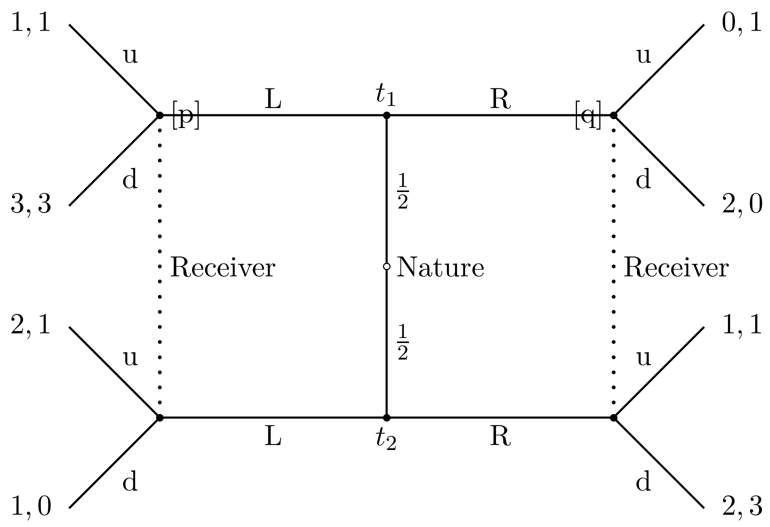
   (a) Suppose the market for pies operates for only one period. Solve for a Nash Equilibrium where both firms earn zero profits, $\pi_i = \pi_j = 0$. Is this equilibrium unique? Why can't firms collude on the monopoly price, $p = 1$? Explain your answers briefly (2-3 sentences).

   (b) Suppose the market operates for two periods. Solve for the Subgame Perfect Nash Equilibrium that gives the highest profits to the bakers. Comment briefly (1-2 sentences).

   (c) Suppose the market operates for infinitely many periods, and bakers have discount factor $\delta < 1$. Solve for the Subgame Perfect Nash Equilibrium that gives the highest (per period) profits to the bakers. How do these profits compare to your answers in parts (a) and (b)? Explain briefly (2-3 sentences).

   (d) In most real-world markets, increased competition tends to drive down prices. Is this the case in the market for pies? Specifically, comment on how the results in parts (a), (b) and (c) might change if there were three bakers in the market (3-4 sentences).

3. Now consider the following game G':



(a) Is G' a game of complete or incomplete information?

(b) Find two pooling equilibria in G': one where both sender types play L, and another where both sender types play R.

(c) Check whether or not each pooling equilibrium in (b) satisfies Signaling Requirement 5.

(d) Which pooling equilibrium in part (b) seems most reasonable? Explain your answer briefly using concepts from the course (2-3 sentences).

4. Anna and Bo must decide how to share three liters of wine. Their preferences for wine are given by $u_A(x_A) = x_A^{1/3}$ and $u_B(x_B) = x_B^{1/3}$, where x_A is the amount of wine that Anna receives, and x_B is the amount of wine that Bo receives. If they fail to reach an agreement, they both get nothing.

(a) Think of this situation as a coalitional game. What is the set of possible coalitions? Which allocations are in the core?

(b) Think of this situation as a bargaining problem. What is the Nash bargaining solution?

(c) In this particular situation, are all four axioms (PAR, SYM, INV, and IIA) necessary to arrive at the Nash bargaining solution? Briefly explain your answer (2-4 sentences).