Written Exam for the B.Sc. or M.Sc. in Economics summer 2013

Microeconomics C

Final Exam

August 14, 2013

(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.

Please read the questions carefully and answer all questions. Please explain your answers.

1. Consider the following game G:

		Player 2	
		L	R
Player 1	A	$3,3$	$1,0$
	B	$2,2$	$0,4$
	C	$0,1$	$2,1$

   (a) Find all Nash Equilibria in pure and mixed strategies. In which equilibrium does player 1 have the highest expected payoff?

   (b) Consider the repeated game $G(2)$ in which G is repeated twice. Give a Subgame Perfect Nash Equilibrium in which the players play (B, L) in the first round.

   (c) Now go back to G. Assume that player 2 can observe the choice of player 1 before making her own move. Draw this new game in extensive form.

   (d) Give the strategy sets of the players in G and the strategy sets of the players in the game from (c). Explain the differences briefly (2-3 sentences).

   (e) Find all Subgame Perfect Nash Equilibria in the game from (c).

2. Consider the relationship between Nash Equilibrium (NE), Subgame Perfect Nash Equilibrium (SPNE) and Perfect Bayesian Equilibrium (PBE). Assign NE, SPNE and PBE to the variables A, B and C so that the following sentences are correct: "Every A is also a B and a C. Every B is a C. Not every C is also a A."

3. Two firms, 1 and 2, are producing a homogenous good. The firms simultaneously decide to set their production quantities q_1 and q_2. Inverse market demand is given by

$$P = 36 - q_1 - q_2$$

   Both firms have a constant marginal cost of c.

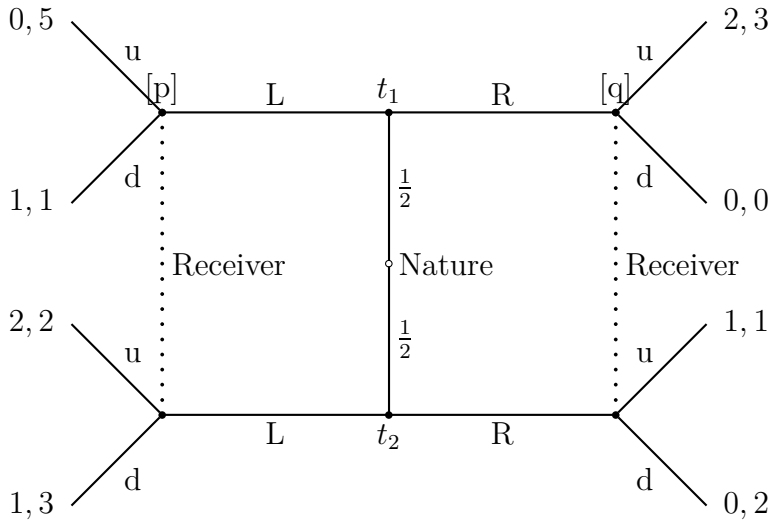
   (a) Find the Nash Equilibrium and give the equilibrium quantities.

   (b) Show that if the two firms merge, the profit of this new firm is higher than the overall profit in (a). Explain briefly (2-3 sentences).

   (c) Now assume that firm 1 still has constant marginal cost c, while firm 2 has marginal cost c_H with probability θ and c_L with probability $1 - \theta$. Firm 2 can observe its own marginal cost, but firm 1 only knows the prior probabilities. For this Bayesian game, give the firm's type spaces, action spaces and strategy spaces, and the beliefs of firm 1.

(d) Find the Bayesian Nash Equilibrium (BNE) of the game described in (c). Show that the Nash Equilibrium you found in (a) is a special case of this BNE.

4. Consider the following signaling game:



(a) Find all pure-strategy Perfect Bayesian Equilibria (pooling and separating).

(b) Using your results from (a), give one pooling PBE that fulfills signaling requirement 6. Does it also fulfill signaling requirement 5?