Written Exam for the B.Sc. or M.Sc. in Economics winter 2013-14

Microeconomics C

Final Exam

February 19, 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).

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

1. Consider the following game G:

	X	Y	Z
A	$3,3$	$1,3$	$3,4$
B	$1,0$	$2,2$	$2,1$
C	$2,2$	$0,2$	$1,3$

   (a) Find all Nash Equilibria (pure and mixed) of G.

   (b) From which of the equilibria (pure and mixed) you found in (a) does player 1 have the highest expected payoff?

   (c) Use iterated elimination of strictly dominated strategies (IESDS) on G, and check that all the pure-strategy NE you found in (a) survived IESDS. Is it possible that a NE does not survive IESDS? Explain briefly (2-3 sentences).

2. For the following two examples, say whether the core is empty or not. If the core is empty, explain briefly (2-3 sentences) why. If it is non-empty, describe one element of the core informally. (In both cases, money can be transferred freely between the players.)

   (a) Three friends have to decide how to allocate \$1 among them. The decision is made by majority voting, i.e. any two friends can decide on an allocation.

   (b) Asger and Bo have a left shoe each, Christoffer has a right shoe. A right and a left shoe together are worth \$1, a single shoe (or two left shoes) are worth nothing.

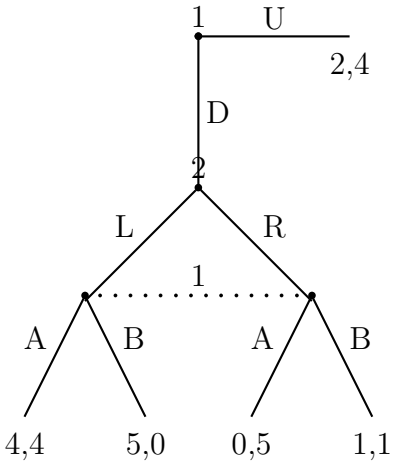
3. Two companies, 1 and 2, are producing a homogenous good and have to decide simultaneously on the quantity they each want to produce. The inverse demand function is $P = a - q_1 - q_2$, and marginal costs are c_1 and c_2.

   (a) Find the Nash Equilibrium quantities.

   (b) What happens with the overall quantity in the Nash Equilibrium if c_1 grows? Explain briefly (2-3 sentences).

   (c) Assume that $c_1 < c_2$. Which company produces a higher quantity in equilibrium? Explain briefly (2-3 sentences).

4. Consider this game:



(a) Is it a dynamic or static game? Is it a game of perfect or imperfect information?

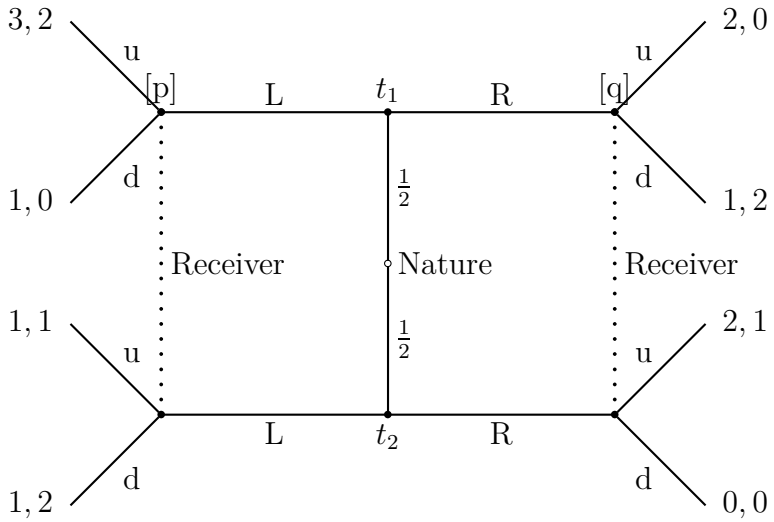
(b) How many subgames are there (not counting the game itself)? What are the strategy sets of the players?

(c) Find all (pure-strategy) Subgame-Perfect Nash Equilibria (SPNE).

(d) Now write the game in bimatrix form and find all Nash Equilibria (NE). Check that there is a NE which are not SPNE. Explain briefly (2-3 sentences) why it can never be the other way around.

(e) Now assume that player 1 can observe player 2's choice before choosing between A and B. What is the strategy set of player 1 now? Find the SPNE of this modified game.

5. Consider the following signaling game:



(a) Find the two types of Perfect Bayesian Equilibria (PBE) in which t_1 sends the message L.

(b) Is there a pooling PBE in which both types send the message L and which satisfies signaling requirement 6? Explain briefly (2-3 sentences).