Written Exam for the B.Sc. or M.Sc. in Economics winter 2014-15

Microeconomics C

Final Exam

June 12, 2015

(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 consists of 3 pages in total, including the current page.

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

<div align="center">

Player 2

	D	E	F
A	$3,4$	$3,1$	$3,3$
B	$2,3$	$1,4$	$2,2$
C	$3,3$	$1,0$	$5,5$

Player 1 B

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   (a) Briefly explain whether F is a game of complete or of incomplete information (1 sentence).

   (b) Find all Nash equilibria (pure and mixed) in F.

   (c) Look back at your answer to part (b). If you found a unique Nash equilibrium, explain the intuition as to why this equilibrium is unique. If you found multiple Nash equilibria, argue which of these equilibria is most reasonable. (2-3 sentences)

2. Now consider the game $G(2)$, with stage game G given by:

<div align="center">

Player 2

|	D	E	F
A	$6,8$	$0,9$	$1,3$
B	$2,0$	$3,3$	$2,2$
C	$6,2$	$2,1$	$5,4$

Player 1 B

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   (a) Find the Subgame Perfect Nash Equilibrium (SPNE) of $G(2)$ that gives the higher total payoff to both players. Find the SPNE of $G(2)$ that gives the lowest total payoff to both players. Argue briefly whether or not each SPNE is also a Nash equilibrium (1-2 sentences).

   (b) Suppose that the payoff $(3,3)$ from strategy profile (B,E) is replaced by $(3,4)$. How does this change affect the two SPNE you found in part (a)? Discuss briefly whether you would expect Player 2 to benefit from this change (2-3 sentences).

   (c) Suppose that the payoff $(3,3)$ from strategy profile (B,E) is replaced by $(4,3)$. How does this change affect the two SPNE you found in part (a)? Discuss briefly whether you expect Player 1 to benefit from this change (2-3 sentences). Explain how your answer compares to that in part (b) (2-3 sentences).

3. Two professors each want the same student to get a job at the University of Copenhagen. The student is sure to get the job as long as she receives a glowing and personal reference from at least one of the professors. But writing such a reference take time: the time-cost of professor i is c_i, which is private information. The two professors must simultaneously decide whether or not to write the reference, with their payoffs given by:

<div align="center">

Prof. 2

	Write	Don't
Write	$1-c_1, 1-c_2$	$1-c_1, 1$
Don't	$1, 1-c_2$	$0,0$

Prof. 1

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   (a) Suppose that $c_1 = c_2 = 1/4$ with probability 1. Briefly describe the main similarity and the main difference between the game played by the Professors and (i) the Prisoners' Dilemma, (ii) the Stag Hunt game, and (iii) the Chicken game (1-2 sentences for each of (i)-(iii)). Who will end up writing the reference?

(b) Continue to assume that $c_1 = 1/4$ with probability 1. But now suppose that $c_2 = 1/4$ with probability θ and $c_2 = 2$ with probability $1 - \theta$, where $\theta < 2/3$. Find the Bayesian Nash equilibrium of this game. Who will end up writing the reference? Describe briefly how your answer compares to that in part (a), and why this is the case (2-3 sentences).

4. Now consider the following game G':
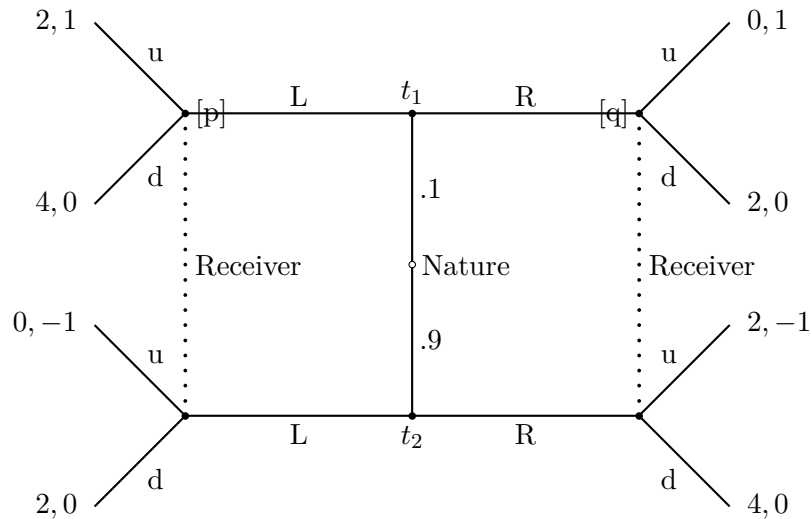
(a) Briefly explain whether G' is a static or a dynamic game (1 sentence).

(b) Find a separating equilibrium in G', and find a pooling equilibrium where both sender types play L.

(c) Check whether the equilibria you found in part (b) satisfy Signaling Requirements 5 and 6.

(d) Describe a hypothetical real-world strategic situation that could correspond to G', and explain why this is the case (3-4 sentences). What (if anything) do your answers to parts (b) and (c) suggest about the behavior we are likely to see in this real-world situation? (2-3 sentences)