Stockholm University

Department of Economics

Course name:	**Economic Strategic Thinking**
Course code:	**EC2109**
Type of exam:	**RETAKE**
Examiner:	**Robert Östling**
Number of credits:	**7.5 credits**
Date of exam:	**Sunday 17 August 2014**
Examination time:	**3 hours [9:00-12:00]**

Write your identification number on each paper and cover sheet (the number stated in the upper right-hand corner on your exam cover).

Use one cover sheet for *all questions* in Part A and one cover sheet *per question* in Part B. Explain notions/concepts and symbols. If you think that a question is vaguely formulated, specify the conditions used for solving it or request to make a phone call to the teacher. Only legible exams will be marked. **No aids are allowed.**

The exam consists of 8 questions. Each question is worth 8 to 28 points, 100 points in total. Credits from the home assignments and class experiment will be added to your exam score. For grade E 45 points are required, for D 50 points, C 60 points, B 75 points and A 90 points.

Your results will be made available on your “My Studies” account **(**www.mitt.su.se) on 5 September 2014 at the latest.

Good luck!

PART A: Multiple-choice questions

Indicate one alternative per question only. Correct answers give 8 points, incorrect answers minus 2 points.

QUESTION 1 (8 POINTS)

Sometimes colleagues want to avoid each other during lunch time. Suppose there are two restaurants to go, Restaurant A and Restaurant B, and that Bob and Francisco both have to decide simultaneously where to go. The payoffs are given in the payoff table below.

		Francisco	
		Restaurant A	Restaurant B
Bob	Restaurant A	X,-1	-1,1
	Restaurant B	-1,1	1,-1

Suppose that Bob and Francisco play the unique mixed strategy Nash equilibrium of this game. By how much does the probability that Bob goes to Restaurant A increase or decrease when X increases from 1 to 2?

(A) Decreases by 0.10.
(B) Increases by 0.10.
(C) Increases by 0.20.
(D) Decreases by 0.20.
(E) Does not change.

QUESTION 2 (8 POINTS)

Consider the simultaneous-move game described by the payoff matrix below. Which of the different game types discuss in the class is this game most similar to?

		Player 2	
		A	B
Player 1	A	73,12	3,2
	B	1,3	16,69

(A) Hi-Lo Coordination
(B) Prisoners' Dilemma
(C) Chicken
(D) Battle of the Sexes
(E) Hide-and-Seek

QUESTION 3 (8 POINTS)
Consider the following two-player simultaneous-move game. How many pure strategy Nash equilibria does the game below have?

		Column			
		W	X	Y	Z
Row	A	83,83	20,20	4,8	1,8
	B	70,70	75,70	0,15	1,70
	C	70,20	18,18	5,20	1,0
	D	20,20	70,70	1,2	0,100
	E	10,0	10,0	2,0	1,1

(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

QUESTION 4 (8 POINTS)
Two players play a game where they together choose the size and how to split a prize. Player 1 decides how large the prize should be: 100 or 1000 SEK. Player 2 chooses how to divide the prize and can either choose an equal split or that Player 2 gets 90% and Player 1 gets 10%. Comparing the Nash equilibrium of the simultaneous-move version of this game to the subgame-perfect Nash equilibrium of sequential-move game where either Player 1 or Player 2 moves first, which statement about move-order advantages are true?

(A) Player 1 has a first-mover advantage.
(B) Player 1 has a second-mover advantage.
(C) Both players benefit when Player 1 moves first.
(D) Both players benefit when Player 1 moves second.
(E) The order of moves does not matter for the players' payoffs.

QUESTION 5 (8 POINTS)
Consider the following three-player game where each player simultaneously chooses A or B. What strategy profiles are pure-strategy Nash equilibria of this game? Payoffs and strategy profiles are denoted as usual, i.e. "X,Y,Z" means X to Player 1, Y to Player 2 and Z to Player 3.

Player 3 plays A

		Player 2	
		A	B
Player 1	A	70,70,70	10,10,23
	B	60,0,0	60,65,10

Player 3 plays B

		Player 2	
		A	B
Player 1	A	70,70,60	10,20,0
	B	80,50,30	60,55,5

(A) (A,A,A) and (B,B,A)
(B) (B,B,B) and (B,B,A)
(C) (A,A,A) and (A,A,B)
(D) (A,A,A), (B,B,A) and (B,B,B)
(E) None of the above alternatives

QUESTION 6 (8 POINTS)
Two firms, A and B, simultaneously choose quantity to produce for the coming year. A's profit function when producing Q_A units is $\Pi_A = P \times Q_A - 2000 \times Q_A$ and B's profit when producing Q_B units is $\Pi_B = P \times Q_B - 2000 \times Q_B$. The market price when they produce Q_A and Q_B units is $P = 10000 - Q_A - Q_B$. Which quantity will A choose in the Nash equilibrium of this game?

(A) 1250 units
(B) 1667 units
(C) 2125 units
(D) 2500 units
(E) 2667 units

PART B: Open-ended questions

Clearly motivate your answers to the following questions and explain any calculations that you make!

QUESTION 7 (24 POINTS)

Consider a town with only two Thai restaurants called Pim and Nam. Both restaurants serve Pad Thai and they can choose whether to charge a high or a low price. The high price gives a profit margin of 5 SEK per customer served and the low price give a profit of 4 SEK per customer. Each restaurant has a loyal customer base of 1,000 customers that visit them once a week irrespectively of the price charged. There is also a floating demand of 4,000 customers per week who all go to the restaurant that charges the lowest price. If both restaurants charge the same price, they will get 2,000 of these customers each.

(A) (6 POINTS) Draw the payoff matrix for the simultaneous-move price-setting game and determine the Nash equilibrium.

(B) (6 POINTS) Explain why the game in (A) is a Prisoners' Dilemma game.

(C) (6 POINTS) Now suppose Pim has a larger loyal customer base of 10,000 (rather than 1,000) customers per week. Profit margins and the floating demand remain the same. Draw the payoff matrix for this game and find the Nash equilibrium. Is this game still a a Prisoners' Dilemma game?

(D) (6 POINTS) How does the existence of a large loyal clientele for Pim solve the dilemma? Relate your answer to other examples where similar resolutions of social dilemmas are plausible.

QUESTION 8 (28 POINTS)

In the first season of the TV series *Breaking Bad*, Walter and Jessie wait for a gangster called Tuco at a junkyard to close a drug deal and the following conversation takes place:

Jesse: A junkyard? Let me guess, you picked this place?

Walter: What's wrong with it? It's private.

Jesse: This is...This is like a...a non-criminal's idea of a drug meet. This is like, "Oh, I saw this in a movie. Ooh, look at me."

Walter: Yeah, so...so where do you transact business? Enlighten me.

Jesse: I don't know. How about Taco Cabeza [a restaurant]? Half the deals I've ever done went down at Taco Cabeza. Nice and public. Open 24 hours. Nobody ever gets shot at Taco Cabeza. Hell, why not the mall? You know, wait at the Gap [a clothing store]. "Hey! It's time for the meet!" You know, I'll put down the flat-front khakis, head on over, grab an Orange Julius [a fruit drink store]. Skip the part where psycho lunatic Tuco, you know, comes and steals my drugs and leaves me bleeding to death.

Use knowledge acquired in this course to rationalize Jesse's argument for making drug deals in public places where many other people are present. Please also briefly discuss whether you find your own argument convincing and in what type of places you think most drug deals take place.

(Hat tip to the student that provided this example in the third home assignment.)