



Stockholm
University

Department of Economics

Course name: Economic Strategic Thinking
Course code: EC2109
Type of exam: REGULAR
Examiner: Robert Östling
Number of credits: 7.5 credits
Date of exam: Sunday 1 June 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. Only legible exams will be marked. **No aids are allowed.**

The exam consists of 8 questions. Each question is worth 8 to 27 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 24 June 2014 at the latest.

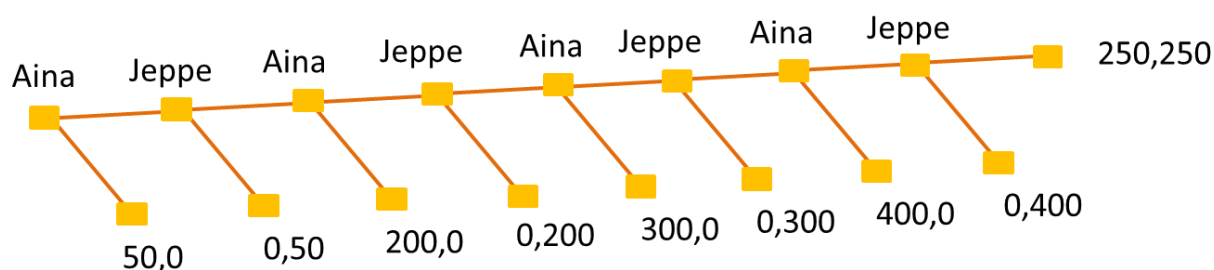
Good luck!

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)

In the final episode of the reality show Paradise Hotel, finalists Jeppe and Aina participate in a game where they together can earn up to 500,000 SEK. Before the game, they promise each other that they will continue all the way to the end so that they split the 500,000 equally between them. A simplified representation of the game they played is shown below. Numbers to the left show Aina's payoff and numbers to the right show Jeppe's payoff. How much do Aina and Jeppe earn together in the subgame perfect Nash equilibrium of the game below?



- (A) 50
- (B) 200
- (C) 300
- (D) 400
- (E) 500

QUESTION 2 (8 POINTS)

Consider the two-player simultaneous-move game shown below where $X < 2$. By how much does the probability that Player 2 plays A change when X increases from -1 to 1 ?

		Player 2	
		A	B
Player 1	A	$X, 1$	$2, 0$
	B	$2, 0$	$1, 1$

- (A) Increases by 25 percentage points
- (B) Increases by 33 percentage points
- (C) Decreases by 25 percentage points
- (D) Does not change
- (E) None of the above alternatives

QUESTION 3 (8 POINTS)

Consider the following two-player simultaneous-move game. How many pure strategy Nash equilibria does the game have and which are these equilibria?

		Column			
		W	X	Y	Z
Row	A	83,83	20,20	4,8	0,90
	B	70,50	65,65	0,15	0,70
	C	70,10	18,18	5,20	0,0
	D	20,20	70,0	1,2	0,100
	E	10,0	10,0	2,0	1,1

- (A) The unique Nash equilibrium is (B,X)
- (B) The unique Nash equilibrium is (A,W).
- (C) Two pure strategy Nash equilibria: (A,W) and (B,X).
- (D) Three pure strategy Nash equilibria: (A,W), (C,Y) and (E,Z).
- (E) None of the above alternatives.

QUESTION 4 (8 POINTS)

Consider the two consultancy firms Fluffy Advice and Strategic Thinking Inc that provide strategic advice on various matters to wealthy individuals. They both face a choice whether to charge 1000 or 5000 SEK per hour. Suppose the two firms play this pricing game forever after and that their payoffs are represented by the payoff matrix below (where “M” stands for million SEK). What is the highest effective rate of return, R , that is required to sustain collusion on high prices by grim trigger strategies?

		Strategic Thinking Inc	
		5000	1000
Fluffy Advice	5000	1 M, 1 M	0.25 M, 2 M
	1000	2 M, 0.25 M	0.5 M, 0.5 M

- (A) R cannot be larger than 50 percent.
- (B) R cannot be larger than 25 percent.
- (C) R cannot be larger than 12.5 percent.
- (D) Collusion cannot be sustained for any R .
- (E) Collusion can be sustained irrespectively of R .

QUESTION 5 (8 POINTS)

Anna and Eva have finally decided to go on a date just after they have taken their game theory exam. As you already know, talking is not allowed when writing exams and unfortunately they did not decide which restaurant to go to before the exam. They both know that Eva's absolute favourite restaurant is called Crazy Thai and that Eva so much likes the food there that she goes there whenever she gets the chance. They also know that Eva would be too busy eating to really enjoy Anna's company if they went there together. Anna's favourite restaurant is Bruce's Diner which she enjoys slightly more than Crazy Thai. Most important for Anna, however, is to go to a restaurant together with Eva. She doesn't have that much money and prefer not to spend any money on restaurant food if she eats alone. The payoffs to Anna and Eva are described by the payoff matrix below.

		Eva	
		Bruce's Diner	Crazy Thai
Anna	Bruce's Diner	7,6	0,7
	Crazy Thai	0,0	6,4

Anna and Eva have decided that they should go to the restaurant right after they have finished the game theory exam. Eva is now considering whether she should make a strategic move and finish the exam a little earlier and go to one of the two restaurants ahead of Anna. Comparing the pure-strategy Nash equilibrium of the simultaneous-move game to the subgame perfect Nash equilibrium when Eva moves first, which restaurant does Eva go to and who benefits from this? Assume that Anna can observe which restaurant that Eva goes to and that Eva's choice of restaurant is irreversible.

- (A) Eva goes to Crazy Thai and only she benefits from this.
- (B) Eva goes to Crazy Thai and both Anna and Eva benefit.
- (C) Eva goes to Bruce's Diner and Anna benefits from this.
- (D) Eva goes to Bruce's Diner and both Anna and Eva benefit from this.
- (E) The order of moves is irrelevant in this game.

QUESTION 6 (8 POINTS)

Suppose there are two firms, Bob and Önos, that both produce marmalade. They both have to choose simultaneously what quantity to produce for the coming year. Bob's profit function when producing Q_B million jars of marmalade is $\Pi_B = P \times Q_B - 10 \times Q_B$ million SEK and Önos' profit when producing $Q_{\ddot{o}}$ million jars is $\Pi_{\ddot{o}} = P \times Q_{\ddot{o}} - 10 \times Q_{\ddot{o}}$ million SEK. The price of marmalade when they produce Q_B and $Q_{\ddot{o}}$ million units is $P = 14 - Q_B - Q_{\ddot{o}}$. Which quantity will Bob choose in the Nash equilibrium of this game?

- (A) 1/2 million jars of marmalade.
- (B) 4/5 million jars of marmalade.
- (C) 3/4 million jars of marmalade.
- (D) 5/4 million jars of marmalade.
- (E) 4/3 million jars of marmalade.

PART B: Open-ended questions

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

QUESTION 7 (27 POINTS)

Ten economists are supposed to write a report about climate change for a government agency. Each economist individually takes a decision whether to contribute to the report, or to shirk and spend time on Facebook instead. The time and effort spent when helping out corresponds to a monetary cost of 100,000 SEK each (which is zero when shirking). The economists get paid depending on the quality of the report, which in turn depends on how many helped out in writing it. For part (A) to (D) of this question, we assume that all workers strive to maximize their monetary earnings.

(A) (5 POINTS) Suppose first that each economist get paid 30,000 SEK times the number of economists that contribute to the report. Draw a diagram showing the payoff for one of the economists of contributing to the report when n other economists are contributing. Use the same diagram to also show the payoff from shirking when n other economists are contributing.

(B) (5 POINTS) What is the pure-strategy Nash equilibrium if all economists decide simultaneously whether to contribute or not and they are paid as in part (A) of the question?

(C) (5 POINTS) Suppose now that they get paid 300,000 SEK if all economists contribute to the report and zero otherwise. Draw a similar diagram as in part (A) that shows the payoff to one economist from contributing/shirking when n other economists are contributing.

(D) (5 POINTS) What is the pure-strategy Nash equilibrium if all economists decide simultaneously whether to contribute or not and they are paid as in part (C) of the question?

(E) (7 POINTS) Suppose that you just got your first job and that you had to write a report together with your new colleagues. Assume that you and your colleagues were paid as in part (A). How many economists do you think would contribute to the report? Would your answer differ if you instead were paid as in part (C)? Make sure to relate your answer both to theory and empirical evidence discussed in the course.

QUESTION 8 (25 POINTS)

A little more than a week ago, on Tuesday May 20, Thailand's military leaders unilaterally declared martial law (= control of an area by military forces rather than by the police). Soldiers and tanks appeared on the streets and TV broadcasts were suspended. General Prayuth Chan-ocha declared that it was not a coup and that martial law had been introduced temporarily in order to ensure law and order. Two days later, however, General Chan-ocha declared that the military had taken control of the country in a coup.

Discuss in light of what you have learned in this course the credibility of General Chan-ocha's initial statement: "This is not a coup".

(There has been political turmoil between two factions in Thailand for a long time: "red shirts" and former Prime Minister Thaksin on one side and political parties supported by the military and royal family on the other. Coups are unfortunately not uncommon in Thailand – there have been at least 18 actual and attempted military takeovers since 1932.)