Course name:	**Intermediate Microeconomics**
Course code:	**EC2101**
Semester:	**Autumn 2015**
Type of exam:	**Retake**
Examiner:	**Hans Wijkander**
Number of credits:	**7,5 credits (hp)**
Date of exam:	**Saturday, December 5, 2015**
Examination time:	**5 hours (09:00-14:00)**

Write your exam 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 per question. Explain notions/concepts and symbols. If you think that a question is vaguely formulated or ambiguous, specify the conditions used for solving it. Only legible exams will be marked. **No aids are allowed.**

You may give your answers in either English <u>or</u> Swedish, but not both, please use the corresponding cover sheet(s) to indicate which language you provide your answers in.

The exam consists of 4 questions, 100 points in total. For the grade E 40 points are required, for D 45 points, C 55 points, B 70 points and A 85 points.

Your results will be made available on your "My Studies" account (<u>www.mitt.su.se</u>) on the 29th of December at the latest.

Good luck!

1. Saving for one's pension is one of the more important decisions one makes during the period of life when one works. Consider an individual who lives two periods. Period 1 is when working and Period 2 is the retirement period. In Period 1, she gets a fixed income, Y. The income in Period 1 is allocated to consumption in Period 1, C_1, and saving, S. In Period 2, she consumes the savings and the interest income she has received. The interest rate is r. Consumption in the second period is denoted, C_2. (Negative consumption is not allowed)
    a. Write down the budget constraints for the two periods (Hint: Two budget constraints). (5 points)
    b. Write down the life-time or consolidated budget constraint (Hint: Start with the budget constraints for the two periods and then insert the second period budget constraint into the first period budget constraint). (5 points)
    c. Suppose the individual has got a utility function $U = U(C_1, C_2)$. Write down her utility maximization problem. (5 points)
    d. What is the marginal rate of substitution between consumption in the first and second periods when the individual has maximized utility? (5 points)
    e. Suppose the utility function is $U = C_1^{1/2} C_2^{1/2}$, $Y = 10$ and $r = 0.10$. Calculate first and second period consumption. (5 points)

2. Consider a prison in which the warden has decided to give the inmates a bonus for good behavior. They get 5 chocolate bars and 5 cokes each. However, the inmates have different tastes. Some of them are very fond of chocolate and others are more fond of coke. There are 1000 inmates. 500 inmates are "chocolate lovers" and the rest (500) fancy coke. After they have received the bonus, they start to trade with each other and a competitive market, with competitive prices of chocolate bars and coke, arises. The chocolate lovers' utility function is $U_{ch} = ch^{2/3} co^{1/3}$ and the coke lovers' utility function is $U_{co} = ch^{1/3} co^{2/3}$.
    a. Write down the budget constraint for each type of inmate. Use P_{ch} and P_{co} for prices of chocolate bars and coke. (5 points)
    b. Write down the excess demand functions (Hint: Derive both types of prisoners' demand functions for chocolate bars and coke). (5 points)
    c. Calculate the market clearing prices of chocolate bars and coke. (5 points)
    d. How much of the two commodities do the different types of inmates consume?
    e. Is the competitive solution Pareto efficient? (Motivate your answer) (5 points)

3. Consider the following simultaneous move game with the following payoffs, known by both players.

a.

Row Player	Column Player		
		Left	Right
	Top	1,2	0,1
	Bottom	2,1	1,2

Row Player's payoffs are the first entries and Column Player's are the second entries, i.e., (Row Player, Column Player). Has any, or both, of the two players got a dominant strategy in this game? (5 points)

b. Consider the following game:

Row Player	Column Player		
		Left	Right
	Top	5,2	0,1
	Bottom	4,1	3,2

Has the game got a single Nash equilibrium or several equilibriums in pure strategies? (5 points)

c. Continue with the following game:

Row Player	Column Player		
		Left	Right
	Top	3,2	0,3
	Bottom	2,3	1,2

Is there a Nash equilibrium, pure or mixed, in this game? (5 points)

d. Suppose now that Row Player gets to move first. How would that change the outcome of the game? (5 points)

e. The game below goes under the name prisoners' dilemma game. Explore the equilibrium in the game. Suppose now that the game is played three times. The players know that. What are the equilibrium strategies in this repeated game? (Motivate your answer) (5 points)

Row Player	Column Player		
		Left	Right
	Top	-3,-3	0,-6
	Bottom	-6,0	-1,-1

4. A consumer has wealth, W, initially and faces the chance to gain g with probability π or to loose l with probability $(1 - \pi)$. The utility function is $U = U(y)$ where y is the wealth in the different states that can arise.

   a. Write down the consumer's expected utility. (5 points)
   b. Write down the individual's expected income. (5 points)
   c. Suppose the utility function $U = U(y)$ is: $U = \sqrt{y}$. What is the implication of that utility function for the individual's attitude to risk (risk-averse, risk-neutral or risk-loving)? Motivate your answer. (5 points)
   d. Suppose now that the utility function is $U = \sqrt{y}$, $W = 100$, $l = 100$, $g = 0$ and $\pi = 1/2$. Show, in a diagram, the cost of risk. (5 points)
   e. The result of the d part of the question is that risk is costly. The implication is that the individual would be prepared to buy insurance against the bad outcome. With a competitive insurance market the individual would buy insurance so as to get fully insured. Suppose now that the individual can exercise effort to reduce the risk for the bad outcome but that effort gives the individual disutility. Suppose also that insurance companies cannot observe the level of effort to avoid risk exercised by the individual. Explain briefly how that would affect to what extent the individual would get insured. (5 points)