



Stockholm
University

Department of Economics

Course name: Intermediate Microeconomics
Course code: EC2101
Type of exam: Main
Examiner: Hans Wijkander
Number of credits: 7,5 credits
Date of exam: 29th of October, 2016
Examination time: 09.00-14.00

Write your identification number on each answer sheet. Use the printed answer sheets for all your answers. Do not answer more than one question on each answer sheet.

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 4 main questions. There are five sub-questions pertaining to question 4. The sub-questions should only be answered by students who have not received an extra credit.

Questions 1-4 are worth 25 points each (question 4: 15 points plus the extra sub-questions worth 10 points). The maximum score is 100 points. *Indicative* scale: 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 21st of November at the latest.

Good luck!

1. Ms. S. Ave's life can be divided into two periods. In period 1 she works and gets income Y which she splits between consumption in the first period, C_1 , and savings, S . In the other period her consumption, C_2 equals the savings from the first period plus the interest income she gets on her savings. The interest rate is r .
 - a) Write down the period 1 and period 2 budget constraints as well as the consolidated (total) budget constraint. (5 points)
 - b) Suppose Ms. S. Ave's utility function is: $u = \sqrt{C_1 C_2}$. Write down the Lagrange function for Ms. Ave's utility maximization problem. (5 points)
 - c) Write down the first order conditions for the maximization problem and calculate the demand functions for consumption in the first and second periods. (5 points)
 - d) Suppose the interest rate falls, how would that affect savings, S ? (5 points)
 - e) How would the result in d be altered if instead the utility function were $u = \min(C_1, C_2)$, i.e., if the consumption in the two periods were perfect complements? (5 points)
2. Mr. N.O. Risk is rich. He owns a house and has financial wealth totaling SEK 36. He is exposed to a risk that his house burns down. In that case the remaining wealth will be SEK 16. The probability of fire is $1/2$.
 - a) What is the expected value of Mr. Risk's wealth? (5 points)
 - b) Suppose Mr. Risk's utility for each outcome is: \sqrt{W} , where W is the wealth in different situations. Write down the formula for Mr. Risk's expected utility and calculate the value of his expected utility. (5 points)
 - c) Calculate Mr. Risk's cost of risk. (5 points)
 - d) Suppose there are competitive, risk-neutral, insurance companies that are willing to provide insurance. Write down the Mr. Risk's expected utility when he buys insurance. Denote the reimbursement he gets in the case of fire, R and the premium he pays, P . (5 points)
 - e) To be competitive the insurance company needs to set reimbursement in the case of fire and premium so as to maximize Mr. Risk's utility, without making an expected loss. Calculate the premium and reimbursement that Mr. Risk will be offered. (5 points)

Question 3 must be answered in English!

3. Consider a monopoly (firm A) which produces and sells gadgets. The firm has been around for a long time, implying it has no fixed cost for the production. The inverse market demand function is: $p = (\alpha - \beta Q)$, where p is the price of gadgets, Q is total supply and α, β are positive constants. Firm A's marginal (and average-) cost for producing gadgets is c .
 - a) Write Firm A's profit function (5 points)
 - b) What is the profit-maximizing quantity of gadgets that Firm A produces? Which price does it charge for gadgets? (5 points)
 - c) Calculate firm A's profit. (5 points)
 - d) Suppose now that a firm B considers entering the market. If it enters, the two firms decide about production volumes simultaneously. Firm B has got the same marginal cost as firm A but it also has a fixed cost F to set up a production plant. Suppose also that: $\alpha = 5$, $\beta = 1$, $c = 2$ and $F = 2/3$. Find the equilibrium price and equilibrium quantities. Calculate firm B's profit? (5 points)

- e) Suppose now that production volumes are not decided simultaneously. Instead firm A decides first. Firm B decides its production volume knowing Firm A's production volume. Find the production volumes the two firms will produce in equilibrium. Find the two firms' profits. (Parameter values for α, β, c and F are the same as in the d part of the question). (5 points)
4. Consider a stylized model of the market for used cars. There are only two types of cars on the market: good cars called Plums and bad cars called Lemons. There are many, risk-neutral, buyers of used cars (many more buyers than sellers). They are prepared to pay SEK 15,000 for a Lemon and SEK 36,000 for a Plum. Sellers of Lemons are prepared to sell for SEK 10,000 and sellers of Plums are prepared to sell for SEK 30,000. Sellers know if they have a good or a bad car but buyers cannot distinguish between good and bad cars. Buyers know the distribution of good and bad cars and what different sellers are prepared to sell for.
- a) Suppose the fraction of Lemons is $\frac{1}{3}$ and the fraction of Plums is $\frac{2}{3}$. What is the equilibrium price? (5 points)
- b) Is the market equilibrium efficient? Motivate why it is, or why it isn't. (5 points)
- c) Suppose the distribution of Lemons and Plums instead were $\frac{1}{4}$ of Lemons and $\frac{3}{4}$ of Plums. What would the market outcome be, in terms of sold cars? (5 points)

Sub-questions d – h should be answered only if you have NOT received credit from assignments

- d) Consider two consumers (a and b) with utility functions $u_a = x_1^a x_2^a$ and $u_b = (x_1^b)^{\frac{2}{3}} (x_2^b)^{\frac{1}{3}}$, respectively. The prices for the two commodities are p_1 and p_2 , respectively. The consumers have incomes M_a and M_b . Can aggregate demand functions for the first and second commodities be written as $X_i = X_i(p_1, p_2, M_a + M_b)$, $i = 1, 2$? Motivate your answer. (2 points)
- e) Many insurance companies are mutual insurance companies. Explain why it is beneficial to policyholders to pool risks. (2 points)
- f) State what Walras' Law says. (2 points)
- g) Does a two player, two actions simultaneous move game in normal form always have Nash equilibrium? Motivate your answer. (2 points)
- h) Explain the relation between different degrees of returns to scale and the slope (down- or upward or flat) of marginal cost curves. (2 points)