

STOCKHOLM UNIVERSITY
Department of Economics

Course name: Intermediate Microeconomics
Course code: EC2101
Examiner: Hans Wijkander
Number of credits: 7,5 credits
Date of exam: Saturday 13 December
Examination time: 5 hours (09:00-14:00)

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

Do not write answers to more than one question in the same cover 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 questions. Each question is worth 25 points, 100 points in total. For the 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 2 January 2015 at the latest.

Good luck!

1. Maximization's preferences are represented by a utility function $U = x_1^{1/2} x_2^{1/2}$. Max has got an income Y and the prices of x_1 and x_2 are p_1 and p_2 , respectively.
 - a) Derive Max's demand functions for x_1 and x_2 , respectively. (5p)
 - b) Calculate price- and income elasticities for the two goods. (5p)
 - c) Suppose, $p_1 = 1$, $p_2 = 1$ and $Y = 2$, initially. The government imposes a per unit tax $t = 3$ on the first commodity, so that $p_1 + t = 4$. How much would Max be prepared to pay to avoid the tax increase (i.e., calculate equivalent variation)? (5p)
 - d) Is the amount calculated in the question's c part larger or smaller than the government's tax revenue, should the tax be imposed? (5p)
 - e) Calculate the compensated variation to the tax increase. (5p)

2. Consider a market where there is only one producer and no potential entrant. It faces a linear market demand curve for its product. **(Answer to question 2 must be in English!)**
 - a) What does one call such a market? (5p)
 - b) Suppose the inverse market demand curve is $p(y) = a - by$, where a and b are positive parameters and y is the amount of the commodity sold. $p(y)$ is the price of the commodity. The producer's cost function is: $c = c(y)$. What characterizes the producer's choice of profit maximizing output quantity? (5p)
 - c) Suppose now that the inverse demand function is $p(y) = 5 - 2y$ and $c(y) = y^2 + F$. Calculate the profit maximizing quantity for the case where $F = 0$. (5p)
 - d) Suppose now that $F = 3$, what is the profit maximizing quantity in this case? (5p)
 - e) Now return to the case where $F = 0$, is the profit maximizing quantity welfare maximizing? (5p)

3. On the used car market there are two types of cars, bad cars called Lemons and good cars called Peaches. Sellers know which kind of car they sell but buyers cannot distinguish between Lemons and Peaches. Suppose there are 1 000 cars of each type that are put up for sale. Sellers of Lemons are prepared to sell for SEK 40 000 and seller of Peaches are prepared to sell for SEK 60 000. Buyers value a Lemon to SEK 50 000 and a Peach to SEK 80 000. There is a large number of buyers. They are all risk-neutral.

- a) What does one call the type of information asymmetry that characterizes the used car market? (5p)
- b) Calculate the market price of a used car under the setting described above. (5p)
- c) Suppose now that instead of 1 000 cars of each type, there are 1 500 Lemons and only 500 Peaches that are put up for sale. What would the market-price be in this case? (5p)
- d) In the last case with 1 500 Lemons and 500 Peaches up for sale, suppose sellers of Peaches could at a cost of SEK 12 000 obtain a 100% accurate certificate that the car they sell is a Peach. Sellers of Lemons could also, at SEK 12 000, obtain a certificate which states what type of car they sell. In that case, a Lemon. Describe how that would change the functioning of the used car market and the equilibrium market price(s). (5p)
- e) What does one call an equilibrium such as that in the d question? (5p)

4. Consider an economy with only two consumers, Number One and Number Two. They both have utility functions which depend on their consumption of two commodities X and Y . Hence, Number One's utility function is $U_1 = X_1Y_1$, where index 1 indicates Number One's utility and consumption. Number Two's utility function is $U_2 = X_2Y_2$.

- a) Explain what Pareto-efficiency in consumption is and state the marginal condition that characterizes a Pareto-efficient allocation. (5 points)
- b) Suppose Number One initially is endowed with 5 units of X and nothing of Y while Number Two is endowed with 5 units of Y and nothing of X . Is the initial allocation of commodities Pareto-efficient? (5 points)
- c) Show in an Edgeworth box the area which is better for both Number One and Number Two. (5 points)

- d) Suppose both consumers behave competitively and that they trade between them. What would be the outcome of such a trade? Is the outcome Pareto-efficient? Show in a diagram or by using algebra or by using both diagram and algebra. (5 points)
- e) Suppose now that Number Two's Utility function is $U_2 = X_2Y_2 - 0.1X_1$, both consumers behave competitively and decide about their own consumption as if the other consumer's consumption were given. Is a competitive equilibrium Pareto efficient under these conditions (argue in words)? (5 points)