



Stockholm
University

Department of Economics

Course name: Intermediate microeconomics
Course code: EC2101
Type of exam: Main
Examiner: Adam Jacobsson
Number of credits: 7,5 credits
Date of exam: Sunday 19 March 2017
Examination time: 5 hours (09:00-14:00)

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

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.**

You may answer in English or in Swedish.

The exam consists of 5 questions. Questions 1-3 are worth 25 points each, question 4 is worth 15 points and question 5 is worth 10 points. The maximum score on the exam is 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.

If you have the course credit you do not answer question 5.

Your results will be made available on your "My Studies" account (www.mitt.su.se) on 7 April at the latest.

Good luck!

Question 1

Kim can consume two goods, x_1 and x_2 , at prices p_1 and p_2 , respectively. Kim's preferences are represented by the following utility function: $u_1(x_1, x_2) = x_1x_2^2$. Kim has an income of m .

- Would the utility function $u_2(x_1, x_2) = 5x_1x_2^2$ still represent Kim's preferences? Motivate your answer! (4 points)
- Derive Kim's Marshallian demand functions for the two goods using the utility function $u_1(x_1, x_2) = x_1x_2^2$. (10 points)
- What are the Marshallian demand functions for the two goods using the utility function $u_3(x_1, x_2) = \frac{1}{8}x_1x_2^2$? (4 points)
- Derive an expression for the marginal rate of substitution between, x_1 and x_2 , for $u_3(x_1, x_2) = \frac{1}{8}x_1x_2^2$. Calculate the MRS for
 - $x_1 = 1$ and $x_2 = 10$.
 - $x_1 = 10$ and $x_2 = 1$.
 Describe in words what the MRS means and relate this to your answers under i) and ii). (4 points)
- Are x_1 and x_2 normal goods? Explain! (3 points)

Question 2

For questions 2a to 2d, consider the two games on strategic form below where the row player is player 1 and the column player is player 2. The payoffs are written in the order of player 1, player 2.

		i)			ii)	
		2			2	
		L	R		L	R
1	T	2, 2	0, 3	1	4, 1	1, 3
	B	3, 0	1, 1		3, 3	2, 1

- Find all the pure strategy Nash equilibria in games i) and ii). (5 points)
- In the games i) and ii), can we find any dominant pure strategies? (5 points)
- Can you find any mixed strategy Nash equilibria in game ii)? (10 points)
- Illustrate one of the mixed strategy Nash equilibria that you found (if any) under c) in a graph that shows the best responses of both players. (5 points)

Question 3

A firm has the production function $f(K, L) = 2K^{1/2} L^{1/2}$, where K denotes capital and L denotes labour. Let r and w denote the prices of capital and labour, respectively. Let p denote the price of the good that is being produced.

- a) Is the technology of the firm associated with decreasing-, constant- or increasing returns to scale? Motivate your answer. (5 points)

In the short run the capital stock is fixed, i.e. $K = \bar{K}$.

- b) State the short-run profit maximization problem. What is the optimal level of labour which maximizes profit in the short run? (10 points)
- c) What is then the short run supply function? (5 points)

In the long run both input factors are variable.

- d) Calculate the technical rate of substitution (TRS). Explain intuitively what it means and illustrate in a graph (hint, you might want to draw an isoquant here. Also, you might want to think about the analogy to the MRS in question 1). (5 points)

Question 4

Mr Magoo owns and drives a car which he will wreck with probability π (and does not wreck with probability $(1 - \pi)$). If Mr Magoo wrecks the car his wealth is reduced from 10 to 3 SEK. Mr Magoo's utility from wealth in each state of the world $i \in \{1, 2\}$ is $u(c_i) = c_i^2$ where c_i is the wealth in state i . In state 1 Mr Magoo wrecks the car and in state 2 he does not.

- a) Write down Mr Magoo's expected utility function. (2 points)
- b) Is Mr Magoo risk averse, risk neutral or a risk lover? Explain your answer. (3 points)
- c) Mr Magoo can choose to buy car insurance which would pay out K in the case of a car wreck. For this insurance contract he would have to pay γK . Assume also that $\pi = \gamma$. Write down Mr Magoo's new expected utility function (including the insurance). What is this particular price level called? (5 points)
- d) How much insurance would Mr Magoo buy? Explain your answer! (5 points)

Question 5

If you have the course credit, do not answer this question.

- a) Assume that workers are either of a high- or a low productivity type and that employers cannot distinguish between the two types when hiring. The workers know their own type. Explain how education could be used as a "signalling" mechanism to overcome the asymmetric information problem in labour markets. (4 points)
- b) Insurance policies are contracts that specify a price that the consumer must pay (the premium) in order to get a certain amount of money to cover some type of loss that occurs stochastically. However, the insurance policy usually does not cover the entire loss. The difference between the total value of the loss and the amount paid out by the insurance policy is called a deductible. Why do we observe deductibles in insurance policies? What type of problems are they intended to compensate for and how? (3 points)
- c) The capital asset pricing model (CAPM) features a characteristic for each asset called the "beta of an asset". What does the beta of an asset mean? How is the beta value of an asset related to the rate of return of the same asset? (3 points)