



Stockholm
University

Department of Economics

Course name: Intermediate Microeconomics
Course code: EC2101
Type of exam: Main
Examiner: Lars Vahtrik
Number of credits: 7,5 credits
Date of exam: Sunday 10 December 2017
Examination time: 5 hours (9:00-14:00)

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

Use one cover sheet per question. 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 Friday 22 December at the latest.

Good luck!

Question 1

Kim has the utility function $U(x_1, x_2) = x_1^{\frac{1}{5}} x_2^{\frac{4}{5}}$

- Set up the Lagrangian and derive an expression for the marginal rate of substitution and calculate the Marshallian demand for both goods. **(9p)**
- Are both goods normal goods to Kim? **(4p)**
- Calculate the price elasticity of demand for both goods at prices $p_1=2$, $p_2=4$ and income $m=150$. Do you expect the elasticity to change with different prices and income? Explain why. **(6p)**
- The monopoly ACME Inc. wants to maximize their revenue from selling good x_1 to Kim. Which quantity should ACME choose to sell to Kim? **(6p)**

Question 2

Consider the following game:

		Player B	
		Left	Right
Player A	Up	4 , 1	0 , 0
	Down	0 , 0	1 , 4

- Find all Nash equilibria in this simultaneous game (including the mixed strategy equilibrium) and illustrate them in a graph showing the best response functions. **(12p)**
- Now assume that player A can choose his/her action before player B and that player B can observe what player A has chosen before B makes his/her choice. Draw the sequential game in extensive form and find the equilibrium (subgame perfect equilibrium). Is there a first mover advantage in this game? **(8p)**
- Write down the proper normal form (two by four) of the sequential game in **b)** and find all Nash equilibria in pure strategies. Explain the relationship between these equilibria and the subgame perfect equilibrium. **(5p)**

Question 3

ACME has the production function $f(x_1, x_2) = x_1^{\frac{1}{2}} x_2^{\frac{1}{2}}$. Both inputs are assumed to be variable.

- a) Derive the inverse demand function for both inputs by setting up the appropriate maximization problem and draw a graph representing the inverse factor demand for x_1 . (9p)
- b) Calculate both factor demands as a function of the optimal level of output y . (6p)
- c) Is it possible to derive the long run supply curve for this technology? Explain why. (10p)

Question 4

Consider an economy with three different assets. the price of one unit is the same for all assets. There is an equal probability of "good times" and "bad times" in this economy and the return of each asset varies over these states according to the following table:

	"Good times"	"Bad times"
Chocolates inc.	15	-5
Porridge inc.	-5	15
Vegetables inc.	9	1

- a) Which asset would be the best asset to buy given that you are only able to buy one unit of one of the assets? Explain why. (6p)
- b) Construct an optimal investment portfolio if you can buy two units in total. Explain why your choice is the optimal choice. (9p)

Question 5

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

Draw a graph illustrating the optimal tradeoff between expected return and risk when choosing an optimal portfolio of risky assets. Write down and explain the optimal condition and relate your expression to the graph. Explain the relationship between this condition and the risk adjusted rate of return. (10p)