



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: Tuesday 13 March 2018
Examination time: 5 hours (09:00-14:00)

Write your exam 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.**

Please answer in English.

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 Ladok account (www.student.ladok.se) within 15 working days from the date of the examination.

Good luck!

...and may the force be with you!

Question 1

Yoda can consume two goods, x_1 and x_2 , at prices p_1 and p_2 , respectively. Yoda's preferences are represented by the following utility function: $u_1(x_1, x_2) = \sqrt{x_1 x_2}$. Yoda has an income of m .

- Would the utility function $u_2(x_1, x_2) = x_1 x_2$ still represent Yoda's preferences? Motivate your answer! (5 points)
- Derive Yoda's Marshallian demand functions for the two goods using the utility function $u_1(x_1, x_2) = \sqrt{x_1 x_2}$ (9 points)
- Given your answer in b), what is Yoda's share of total expenditure spent on x_1 ? (3 points)
- Now assume that $m=10$ and $p_1 = 1$ and $p_2 = 2$. Due to an Imperial blockade, p_1 increases to 2. Using your result in b), what is Yoda's consumption of x_1 and x_2 before and after the blockade? How large is the substitution effect and how large is the income effect for x_1 ? Illustrate in a graph! (5 points)
- Has Yoda's share of expenditure on x_1 changed as an effect of the blockade? (3 points)

Question 2

Mr Vader owns a planet called the "Death star" which has a value of 1 000 000 SEK which also constitutes all of Mr Vader's wealth. Mr Vader has preferences represented by the utility function $u(m) = \sqrt{m}$, where m is the wealth of Mr Vader. Unfortunately, the Vader family has some problems and the rebellious son, Luke, threatens to blow up the planet with probability $\pi = 0,1$. If the planet blows up, Mr Vader loses all his wealth.

- Calculate the expected wealth of Mr Vader. (5 points)
- Calculate the expected utility of Mr Vader. (5 points)

Thankfully, the Imperial Bank offers a planetary insurance policy. If Mr Vader wants to have K SEK paid out from the insurance policy if the planet blows up he has to pay γK where $\gamma = 0,1$.

- How much insurance does Mr Vader Buy? What is his expected wealth given that he buys the insurance? Give an intuitive explanation for his choice of K . (10 points)
- What if Mr Vader's preferences are instead represented by $u(m) = m$, and (due to rebel activity) the price of insurance is increased to $\gamma = 0,2$. How much insurance would Mr Vader then buy? Explain and compare to your answer in c). (5 points)

Question 3

Somehow surprisingly, Luke manages to blow up the Death star and Mr Vader is now very upset and plans to invade the rebel base. The rebels can deploy their forces either on the north or the south side of their base and Vader's Imperial forces has to decide whether to attack from the north or from the south. The two sides do not know the decision of their opponent when they make their choice. If Vader attacks a defended side he will lose while he will win if he attacks an undefended side. The payoffs are illustrated in the payoff matrix below (Vader's payoff is written first, followed by the rebels'):

		The rebels defend	
		North	South
Mr Vader attacks	North	0, 1	1, 0
	South	1, 0	0, 1

- a) Does anyone have a dominant pure strategy? Explain! (5 points)
- b) Can you find any Nash equilibria in pure strategies? (5 points)
- c) Can you find any mixed strategy Nash equilibria? (10 points)
- d) 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 4

Meanwhile, in another part of the Empire, the different planets need to decide on how many space ships, s , they should send out to harvest space fish. A space ship costs 2 SEK and one unit of fish can be sold for a galactic market price of 1 (a constant price). Total fish production is given by: $f(s) = 20\sqrt{s}$. The Imperial senate has a space fish sub-committee which has the task of maximizing Imperial profits and therefore decides how many space ships the planets should build to fish with.

- a) How many ships does the senate decide to build? (4 points)
- b) How large are total profits? (2 points)

Due to political unrest caused by recent rebel activity, the Imperial senate loses its grip on power and now the planets decide individually how many space ships to build and send out fishing.

- c) How many ships will now be fishing? (4 points)
- d) How large are total profits now? (2 points)
- e) Compare your answers in a) and b) to your answers in c) and d) and explain the differences, if any. (3 points)

Question 5

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

- a) Assume that there are good spaceships (plums) and bad spaceships (lemons) in the market for used spaceships. The sellers know what they are selling but the buyers do not know what they are buying. Explain under what circumstances the plums might disappear from the market and suggest one way of dealing with this problem? (4 points)
- b) State the Coase theorem and explain the role of transaction costs. (3 points)
- c) A firm produces widgets according to the production function: $f(k, l) = k^{1/3}l$ where k is capital and l is labour. Does the firm's production function exhibit constant- decreasing- or increasing returns to scale? Explain your answer! (3 points)