Written Exam for the B.Sc. in Economics, Winter 2010/2011

Mikroøkonomi A

Final Exam

10 January 2011

(3-hour closed book exam)

Please note that the language used in your exam paper must correspond to the language of the title for which you registered during exam registration. I.e. if you registered for the English title of the course, you must write your exam paper in English. Likewise, if you registered for the Danish title of the course or if you registered for the English title which was followed by “eksamen på dansk” in brackets, you must write your exam paper in Danish.

If you are in doubt about which title you registered for, please see the print of your exam registration from the students’ self-service system.

Problem 1

Consider a Koopmans economy in which the consumer's initial endowment consists of 24 hours of time (and no food). Time can either be consumed as leisure or used as labor input in a firm whose output is food.
The consumer's preferences can be represented by the utility function $u(x_1, x_2) = x_1 \cdot x_2$, with x_1 being the units of leisure consumed, x_2 being the quantity of food consumed, both non-negative.
The firm has a production function given by $y = \max \{ q - 2, 0\}$, with q being the non-negative quantity of labor input and y being the quantity of food output.

- Illustrate this economy in a diagram
- Find the Pareto-Optimal (Pareto Efficient) allocation (i.e. compute values for production plan and consumption plan).
- Is it possible to implement this allocation in a market equilibrium (i.e. finding a suitable price system)?

Problem 2

Define, discuss, and compare these two concepts:

- Compensating variations (CV)
- Equivalent variations (EV)

Problem 3

Consider a consumer living in a private-ownership and pure-exchange economy. There are two goods, food and housing. Consider a situation in which the consumer is a net seller of housing. Imagine that the price of housing increases (relative to the price of food):

- Will the consumer ever wish to become a net buyer of housing?
- Will the consumer necessarily want to sell more housing than before?
- Will the consumer be worse or better off after the price change?

Problem 4

A consumer has the utility function $u(x_1,x_2) = 2 \cdot x_1^{\frac{1}{2}} + x_2$ (with both quantities being non-negative), good 1 being housing and good 2 being food.

- Solve the utility maximization problem when prices are (p_1,p_2) and the exogenous income is m, all taking on strictly positive values.

Problem 5

Consider an Edgeworth economy with two consumers Agnes and Burt, who have the utility functions $u_A(x_{1A},x_{2A}) = x_{1A}^{a} \cdot x_{2A}^{(1-a)}$ and $u_B(x_{1B},x_{2B}) = x_{1B}^{b} \cdot x_{2B}^{(1-b)}$, with $0 < a < 1$ og $0 < b < 1$, good 1 being food, good 2 being drinks. They have private ownership to bundles (w_{1A},w_{2A}) and (w_{1B},w_{2B}), respectively, with all these quantities being strictly positive.

- Using good 2 as numeraire, find an expression for the Walrasian equilibrium value of the price of good 1 (food)
- Discuss the way in which parameters a and b affect this equilibrium value of the food price

Problem 6

Consider a firm existing in a world of perfect competition.

- Describe how the firm’s demand for an input (a factor of production) is determined
- Is it possible that the firm’s demand for some input increases when the price of that input increases?