Written Exam for the B.Sc. in Economics Summer 2010-RE

Microeconomics A

Final Exam

17 August 2010

(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.

Question 1

a) Consider the statement: *if a quantity tax is put on a commodity produced by a profit maximizing firm then the firm's profit per unit is reduced by the level of the tax* Comment this statement.
b) Assume that a firm has a supply curve that can be described by $S(p) = \gamma + \delta p$ and the market demand this firm is facing is $D(p) = \alpha - \beta p$. Assume that the firm is a *price taker* (i.e. its decisions do not influence the price). Find the market equilibrium and discuss how the equilibrium is influenced by the parameters β and δ in the model.
c) Assume that a quantity tax *t* is put on the commodity. Analyse how this influence the equilibrium and relate the answer to the discussion of the parameters in question b) and your answer in question a).
d) If the tax revenue is paid back (lump sum subsidies) to the producers and consumers relative to their tax burden, are the consumers and producers then affected by the tax – discuss and illustrate.

Question 2

A consumer has monotone increasing, continuous and strictly convex preferences. Consider the following statement:
If the consumer is a net supplier in the market of a good and the price increases then this consumer is better off if he remains a seller.

If you think this statement is true then prove it. If you think it is false then argue why or give a counterexample.

Question 3

Consider an economy of two commodities with private property rights. Show that if a consumer with monotone increasing, continuous and strictly convex preferences is a net buyer in one market then he must be a net supplier in the other market.

Question 4

Describe using the Slutsky equation how we can conclude whether demand increases or decreases following a price increase in an economy with exogenous income. You should especially account for the different types of goods that we can come across. As part of your answer you should also explain/prove why the substitution effect is always negative.

Question 5

James can consume two goods: bread (commodity 1) and butter (commodity 2). James' preferences can be represented by the utility function $u(x_1, x_2) = x_1 x_2 + x_1$.

a) Solve James problem assuming that he has an exogenous income *m* and when the prices are exogenous.
b) If the price on bread changes, what is then the Hicks compensated demand function?
c) Consider a specific case, where *m=100* and prices $(p_1, p_2)=(20,20)$. Since there is a growing nutrition problem in the country, the government has decided to tax butter such that the price increases to 25. How does that influence James' demand? Split the change into income and substitution effects (use the Hicks compensation).
d) How is James welfare measured as the *Compensating variation* influenced?

Question 6

Consider the Edgeworth economy with two goods and two consumers. The consumption possibilities are in $\boldsymbol{R}^2_{++}$**.** The two consumers (Allen and Betty) have preferences that can be described by

$u_A(x_{1A}, x_{2A}) = \alpha_A \ln(x_{1A}) + (1 - \alpha_A) \ln(x_{2A})$ and

$u_B(x_{1B}, x_{2B}) = \alpha_B \ln(x_{1B}) + (1 - \alpha_B) \ln(x_{2B})$

where $\alpha_A = \alpha_B$. The total endowment in the economy is $\omega = (\omega_1, \omega_2)$, where both

$\omega_2 > 0$ and $\omega_1 > 0$.

a) Find the Walras equilibrium in this economy.

There is also a firm in the economy that can transform good 1 to good 2 using the production function $f(q)=q$, where q is the total quantity of input of good 1. Assume that $\omega_A = (15,6)$ and that $\omega_B = (3,6)$. Also normalise the price of good 1 to 1. Allen's share of the firm is γ and Betty's share is $(1-\gamma)$.

b) Find the Walras equilibrium in the case where $\gamma=0.5$

c) Is it possible that Pareto optimal allocation, where Betty gets everything can be implemented as a market equilibrium – how?