Written Exam for the B.Sc. in Economics summer 2013

Microeconomics A

Final Exam

8. August 2013

(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.

This exam question consists of 4 pages in total including this page.

Exercise 1

State for each of the claims below whether they are false or true. Explain.

1) When the firm maximizes profit using a strictly concave production function the value of the marginal product of capital must equal the user cost of capital.
2) The slope of the Hicksian demand curve is always steeper than the Marshallian demand curve.
3) The short run marginal costs curve is always above the long run marginal costs.

Exercise 2

Brian spends his money on housing (good 1) and all other goods (good 2). Brian has preferences for housing and other goods represented by a utility function given by

$$u(x_1, x_2) = 2 \ln x_1 + \ln x_2$$

for every positive amounts of each good. Brian earns each 900 euros each month from his study grant from the government.

The government wishes to help the students to be able to obtain an apartment near their education. They do this by paying a subsidy of 50 per cent on Brians housing expenses. This will decrease the price of housing from 6 euros to 3 euros. Let the price of other goods be 1.

1) What quantity of housing is Hanne's choice *before* the planned subsidy on housing?
2) What quantity of housing is Hanne's choice *after* the subsidy has decreased the price of housing?

The government also considers the alternative of raising the study grant.

3) By what amount of euros should the government raise the study grant leaving Brian as well off as the imposition of the subsidy?
4) What is the deadweight loss from the housing subsidy?

Exercise 3

Consider an economy in which cookies (good 1) and muffins (good 2) are the only goods available. The quantity amount of cookies available in the economy is 10 pounds and muffins is available in the quantity of 20 pounds. There are two consumers, Olivia and John, who both enjoy cookies and muffins, but who have different preferences. Olivia has preferences represented by a utility function $u_O(x_1, x_2) = x_1 + x_2$ and John has preferences represented by the utility function $u_J(x_1, x_2) = \ln x_1 + 3\ln x_2$.

Assume that there is private ownership in the economy, and that Olivia owns 4 pounds of cookies and 10 pounds of muffins. John owns the rest of the total endowment.

1) Show that an allocation in which Olivia obtains the consumption bundle $(x_1, x_2) = (8,14)$ and John the rest is Pareto efficient.
2) Find the demand functions of Olivia and John given their endowments.
3) Find Walrasian equilibrium prices and the corresponding equilibrium allocation
4) Are the allocations in question 1 and 2 Core allocations?

Exercise 4

Consider n producers of pharmaceutical products. In the short run, they have a cost function given by $c(y) = y^2 + 9$ while in the long run, the cost function is $c_{LR}(y) = 6y$.

The aggregate demand for pharmaceuticals is given by the inverse demand function $P(x) = 10 - x$ for every x less than 10 and x is the aggregate amount.

1) Find the short run supply function for the pharmaceutical producers.
2) Derive the short run equilibrium price of pharmaceuticals and the quantity sold for each producer.
3) What is the long run equilibrium price and total supply for pharmaceutical products. Comment.

Exercise 5

Consider an economy with a single consumer, Benny, consuming coconuts (c) and leisure (u). Benny enjoys coconuts and leisure and his preferences on consumption is given by the utility function

$$u(c,u) = \min\{2c, u\}$$

Benny can work no more than 18 hours a day.

Deciding to work *l* hours Benny can acquire $3l$ coconuts.

1) How much does Benny want to work assuming that he wishes to make the best for himself? How many coconuts does he enjoy?

Assume that Benny settles up a firm Benny's Coconuts inc. who hire himself as labour at a rate *w* and pay out any profit left. Benny then buy the coconuts from BC inc. at the price of p.

2) Derive the labour supply of Benny.
3) Find the Walrasian equilibrium of this economy using the price of coconuts as numeraire.