Written Exam for the B.Sc. in Economics autumn 2012-2013

Microeconomics B

Final Exam

Re-exam Winter 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.

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
We can use the Hotelling model of product differentiation to argue both for too much product differentiation and no product differentiation. We can moreover use the model to argue for a positive profit for firms even though we have competition. Explain how the model can be used for this and what are the main arguments to be used to reach these different conclusions. (argue using a model with only two firms).

Question 2
Consider a situation where an employer wants to hire workers to produce an output. Assume that a worker can produce an output y_i, where i refers to two types of workers: H and L being high and low productive workers respectively. Assume that $y_H > y_L$. The price of output is p. We also assume that the two types of workers require a minimum (fixed) wage (r_i) to take the job at the firm. We assume that $r_H > r_L$. Assume that the probability that a worker is of low productivity is q.

a) Discuss how adverse selection can arise in a model like this. You should outline the four different cases that can arise and explain when and how adverse selection can arise.
b) Explain how signalling can be used in this model to overcome the adverse selection problem. Can this always be done? What if the signal influence the productivity of the workers, how may this influence the outcome? (You are not supposed to derive the results, but should include mathematics to support your arguments).

Question 3
Suppose you have a supplier of a consumer good with a supply function $s = \frac{B+p}{4}$, where p is the price on the consumer good in the market. We also have a consumer with a demand function equal to $d = \frac{A-p}{3}$. A and B are parameters of the model.
a) What is the equilibrium price and quantity in this market?

When the consumer good is produced this adds costs for some other consumer in the market. We assume that this additional costs can be expressed as $(2x)^2$; i.e. when the consumer good is produced we have costs (beyond those incurred for the producer) of $(2x)^2$.

b) What is the efficient level of production? Comment on this.
c) A social planner wants to regulate this economy. He is considering regulating using taxes. What tax should the planner introduce in this economy?
d) The planner is also considering setting up a scheme of polluter permits. Explain how this could work, why this is a solution and find the equilibrium permit price in this economy. (In relation to the assumed additional social costs mentioned above, we have assumed that each unit of output produces 2 units of external effect; i.e. the 2x in the external cost function outlined above). Compare the tax and the equilibrium price.

Question 4
Assume that a monopoly firm faces two types of customers with different willingness to pay for the firm's product, but the firm is not able to distinguish between them. The firm can offer a quantity discount.
What are the aspects that the firm must consider in a case like this?

Question 5
Nick and Jill are considering designing/buying a new common garden, which they can both enjoy from the windows in their respective apartments. Their preferences over 'garden' (G_i) and other consumption (x_i) can be represented by the utility functions $u_i(G_i, x_i) = G^{a_i} x_i^{1-a_i}$. Moreover, one unit of garden can be bought by paying one unit of the consumption good. Nick and Jill have exogenous incomes I_i. The income can be used to contribute to purchase of the common garden and the remaining part is used for the general consumption good.

a) How much garden will be bought by Nick and Jill (the total garden is the sum of their individual contribution to the common garden)? It is not possible to contribute with a negative amount.
b) Assume that $a_i=0.5$ for both Nick and Jill. What is the efficient quantity of garden? It differs from the quantity in coming from the answer in a) using these parameter values. Why?
c) What could be done to solve this problem - at least theoretically?

Question 6
Explain why a voting procedure may not be a clever way to make joint decisions in a society.