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

Microeconomics B

Final Exam

17. 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.

Question 1

Consider two monopolies. Monopoly i has the demand function $x_i = D_i(p_1, p_2)$ and the cost function $c(x_i), i = 1,2$, where x_i is the level of its output and p_i its price. Monopoly 1 is the public sector and monopoly 2 is the private sector profit-maximising firm.

The only policy instrument available to influence the behaviour of the private sector firm is the price charged for the output of the public sector firm. Assume that social welfare can be represented as the sum of consumer surplus and profits in the two industries.

a) Show that the optimal second-best price of the public sector firm satisfies

$$m_1 e_{11} + m_2 e_{22} r R_2 / R_1 = 0$$

where $m_i = (p_i - c'_i)/p_i$ is the proportionate deviation of the price from marginal costs in firm i, $e_{ii} = D_{ii} p_i / D_i$ is the own price elasticity of demand for firm i's output, $R_i = p_i D_i$ is expenditure on firms i's output and $r = (dp_2/dp_1)(p_1/p_2)$ is the response elasticity of firm 2's price to changes in the price set by the public firm. (*Hint*: compare the expression above with the optimised welfare function with respect to p_1).

b) Explain and interpret the optimal second best price equation given above.

Question 2

Comment on the following statement:

Short run economic costs must be lower than long run economic costs because long run economic costs include the cost of inputs that are fixed in the short run (and thus are not part of short run cost).

Question 3

Consider the "Microsoft approach" as a strategy to enter the market for PCs, where the Windows operating system is licensed to different PC makers, who then compete with each other, which drives down the price on the PCs.

a) Assume that the aggregate demand function for computers is given by $x = (AN^{\alpha} - p)/\alpha$ where p is the price for a computer. The consumer side of the market is in equilibrium if the network size N is equal to the number of computers sold. Use this to derive the actual demand curve $P(x)$ that takes the network externality fully into account.

b) Suppose that A=100 and α=1. What is the shape of the demand curve from a)? Explain.

c) We say that an equilibrium is *stable* if it does not lie on an upward-sloping part of the demand curve. Explain why. (*Hint:* Suppose that x^* is the equilibrium quantity on the upward sloping part of the demand for some price p^*. Imagine what would happen if slightly more than x^* were bought and what would happen if slightly less than x^* would be bought).

d) Suppose that the supply curve is horizontal at p=2000. What are the equilibria in our model? Which equilibria are stable and which are unstable?

e) Now assume that we begin in an equilibrium where no computers are owned and where the marginal cost of producing computers is 2000. A strategy by the producer is a very aggressive strategy of giving away computers. Explain why this may be a good idea and how many computers should the producer give away?

Question 4

Consider a seller of "lucky chance baskets" (i.e. a closed bag with different "goodies") containing of a combination of quantities of the two products that he is selling. When offered for sale it is announced that the bag contains 25 items. The value of product one is 200 for the seller and 250 for the buyer; the value of product 2 is 100 for the seller and 150 for the buyer.

a) Describe what the potential problem here is and describe which condition that must be satisfied such that an (efficient) market condition is reached. Is it possible for the seller to ensure this?
b) In a slightly more general context than the case described in que. a), how may a seller of such a "hidden" product overcome the problem?

Question 5

a) What lies behind the "Tragedy of the Commons" story?

Let n denote the number hunts (*one hunt* is defined as one hunter going on one hunting trip) in a given hunting area. Each hunt is priced r per hunt, which must be paid irrespective of ownership to the hunting area. The number of ducks shot during a hunting season is $x=f(n)=An^{\alpha}$, where $A>0$ and $0<\alpha<1$ and a duck can be sold on the market for p.

b) Assume that you own the hunting area and you are the only one hunting in the area. How many ducks will you shoot during the season (assume that you are a profit maximiser)?
c) Assume instead that the hunting area is publicly owned and any hunter can hunt during the season. How many ducks will be shot during the season? Explain why the result differs from the answer in b)
d) What is the loss in revenue to any hunter if an additional hunt in the hunting area is undertaken? Assume that one hunter only go one hunt and that an additional hunt means that one more hunter enters.
e) What should an optimal Pigouvian tax per hunt be?

Question 6

Describe how the theory of asymmetric information and adverse selection can explain why some young people voluntarily choose to spend five years at university (e.g. studying economics).