

**Exam 2020-10-22**, 13:00–16:00. Individual open book exam.

I (16p) The following concepts have a different meaning in “everyday language” and in economics. Briefly explain the difference with the help of a contrasting pair of examples.

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|----------------|-----------------|
| (a) Efficiency | (c) Public good |
| (b) Lottery    | (d) Welfare     |

II (20p) Consider the welfare impact of a small policy change in a competitive market. Does it have a definite direction, or could it depend on whether some elasticity is sufficiently high or low; if so in which direction? Do not consider extreme cases (such as zero or infinite elasticity, or non-binding policy). Explain briefly; no need for proofs or graphs.

- (a) Increase of unit subsidy paid to producers, impact on consumer surplus
- (b) Decrease of supply quota, impact on consumer surplus
- (c) Increase in the quantity of price support purchases, impact on producer surplus
- (d) Decrease of price floor, impact on producer surplus
- (e) Increase of proportional tax on buyers, impact on government revenue

III (16p) A cousin finds out that you study economics in a business school. He has a small business and he asks for your thoughts. “I’ve been trying to increase profits by price-cutting. I tried cutting the price by 3%, but was disappointed to see that sales only went up by 2%. What do you think, should I cut the price more?” Give 2–3 sentences of advice.

For the remaining questions you need to show the arguments and steps behind your reasoning, backed up by calculations where relevant.

IV (24p) X Inc produces fuzz for which it faces a yearly demand curve  $Q^D(p) = 140 - 40p$ , where quantity is in tons and price in millions of euros per ton. Last year X invested in a new factory that cost €750 million and is expected to last for another 20 years. The factory has an operating cost of €10 million per year, and a constant marginal cost of €1 million per ton up to a capacity constraint of 100 tons/year. It is owned by investors with an opportunity cost of capital at 5%.

- (a) What price would maximize the profits of X?
- (b) A group of outside investors offers to buy X. What should be the current owners’ reservation price?
- (c) Outside investors believe that they are able to reduce the operating cost immediately by 40% if they reduce the production capacity by half. This capacity reduction entails a one-time modification cost of €30 million. Outside investors have an opportunity cost of capital of 5%. What should be their reservation price for X?

V (24p) Härmä public broadcasting corporation (HäLy) produces high-minded free-to-air live programming for the residents of the Härmä region. It is owned by the three neighboring townships of Itä-Härmä, Keski-Härmä, and Länsi-Härmä. The aggregate demand for live programming by HäLy is  $Q_I^D(p) = 48 - 2p$ ,  $Q_K^D(p) = 31 - p$ , and  $Q_L^D(p) = 48 - 2p$  in the three townships respectively, where the quantity is in hours per day and value in k€/hour. The cost of keeping the station up and running is 190 k€/day. The station can broadcast up to 24 hours per day. The marginal cost of live programming is 15 k€/hour during the day (08-20) and 35 k€/hour during the night (20-08). All costs are shared equally between the owners.

- (a) (12p) What is the efficient quantity of daily broadcasting by HäLy?
- (b) (6p) What is the total surplus in each township if the efficient quantity of broadcasting is produced?
- (c) (3p) Continued from part Va. The marginal cost of public funds is 2 in all Härmä townships. How would taking this into account change the efficient quantity of daily broadcasting?
- (d) (3p) Continued from part Va. It turns out to be possible to broadcast reruns of old live shows at zero marginal cost. These are valued at 4 k€/hour by each of the three townships. Now what is the efficient quantity of daily live broadcasting?