

**Exam 2019-10-24. Calculator policy: same as in Finnish matriculation exams. Notes and other materials are NOT allowed.**

**Multiple choice questions (30p)**

Correct answer +3p, incorrect answer -1p, no answer 0p.

1. As the sole patent holder Axolotl Inc is a monopolist for a vital medicine. Half of the variable cost of producing the medicine is due to an ingredient whose market price falls by 50%. The profit-maximizing response of Axolotl Inc is to cut the price of the medicine if...
  - (a) its demand is elastic.
  - (b) its demand is inelastic.
  - (c) it is a normal good.
  - (d) it is an inferior good.
  - (e) Any of the above.
  
2. A monopolist has constant marginal cost  $MC = 4$  and a sunk cost of 5. It faces aggregate demand  $P^d(q) = 12 - 8q$ . The profit-maximizing price is...
  - (a) 1
  - (b) 2
  - (c) 4
  - (d) 8
  - (e) Production is not profitable at any price, so the monopolist should shut down.
  
3. Continued from question 2. Aggregate demand comes from two groups, urbanites and yokels. At the uniform price both were buying equal amounts, but it turns out that urbanites have more elastic demand. If price customization is possible the price for urbanites should be...
  - (a) lower than the price charged from yokels.
  - (b) the same as the price charged from yokels.
  - (c) higher than the price charged from yokels.
  - (d) The monopolist should ignore the yokels and sell only to urbanites.
  - (e) The information given is not sufficient to choose between the above alternatives.
  
4. A number of countries that share borders along an inland sea meet to decide on policies to clean up the sea. Various alternatives have been proposed. Which of the following is an example of agenda-setting power in action?
  - (a) The decision depends on the order in which proposals are voted on.
  - (b) Countries that benefit more from a clean-up overstate their valuation of the benefits.
  - (c) Countries that benefit less from a clean-up try to free ride on the contributions of others.
  - (d) The decision is hard to reach because countries don't know each others true costs and benefits, so everyone tries to overstate their clean-up costs.
  - (e) All of the above.

5. On most years elderberries cost €10 per basket. A bumper crop increases the harvest by 5%, causing the price to fall to €9 per basket. Price elasticity of demand is about. . .
- (a) -0.2
  - (b) -0.5
  - (c) -1
  - (d) -1.5
  - (e) -2.2
6. Republic of Tropicana eliminates the currently binding price floor on pineapples; from now on the price will be determined in the market. The producer surplus of pineapple farmers. . .
- (a) decreases if pineapples are a normal good.
  - (b) increases if pineapples are a normal good.
  - (c) decreases if the demand for pineapples is sufficiently elastic.
  - (d) increases if the demand for pineapples is sufficiently inelastic.
  - (e) increases if the demand for pineapples is sufficiently elastic.
7. The previously observed investment behavior of Ann and Bob is consistent with having a utility function  $u(v) = \sqrt{v}$  over wealth. Currently their base wealth is zero. A genie offers them a choice between i) a 50-50 gamble for 1 million or nothing and ii) a guaranteed sum of money. The reservation price for choosing the gamble most consistent with their previous behavior is (in millions). . .
- (a) 0.125
  - (b) 0.25
  - (c) 0.414
  - (d) 0.5
  - (e) 0.707
8. In which of the following cases would the pricing of a profit-maximizing monopolist cause no deadweight loss?
- (a) It has zero marginal cost.
  - (b) It faces infinitely elastic demand.
  - (c) It faces unit elastic demand.
  - (d) It is owned by its customers, who are paid back the profits in the form of dividends.
  - (e) It has zero fixed cost.

9. The small village of Lintukoto has 50 households, each of which values the common New Year's fireworks by  $q^d(p) = 10 - 2p$ , where  $p$  is in euros and quantity in the number of rocket explosions. The cost of one rocket is €10. The efficient size of the firework display (in number of explosions) is . . .
- (a) 0
  - (b) 5
  - (c) 9
  - (d) 12
  - (e) 20
10. The market for turnips in Northland experiences a permanent positive supply shock. The demand for turnips is more elastic in the long run than in the short run. After the shock the price of turnips will. . .
- (a) first increase, then decrease but stay above the initial level.
  - (b) first increase, then decrease below the initial level.
  - (c) first decrease, then increase above the initial level.
  - (d) first decrease, then increase but stay below the initial level.
  - (e) first decrease, then decrease even more.

I (12p) Provide a brief explanation (1–3 sentences) for the following concept in Economics. You can use an example (real or hypothetical) to support your explanation. The goal is to make the concept intelligible for a reader who has not studied microeconomics.

- (a) Natural monopoly
- (b) Complements (goods)
- (c) Income elasticity of demand
- (d) Marginal cost of public funds

II (14p) The Organization of Vehicle Dealers (OVD) is campaigning for the elimination of the vehicle tax. Currently the tax on purchases of new vehicles amounts to 50% of the consumer price. OVD argues that, while it is impossible to accurately predict the long-run effects of a tax reform, given that the competition between dealers is fierce, the simplest and most reasonable assumption is that it would lower consumer prices by about 50%. Explain why OVD's argument is unreasonable.

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

III (24p) Acme Inc is considering entering the Bulvanian market. This would involve setting up a local distribution chain, at a cost of €30m. The demand for Acme's ointment in Bulvania is  $Q^d(p) = 40 - 4p$  millions of cans, where  $p$  is in euros. Marginal cost is constant at 3 €/can. In addition, the local government is expected to levy from Acme a tax of 1€ for every can sold. If Acme were to withdraw from the market prior to selling any cans it would recover two thirds of the set-up cost.

- (a) (16p) If Acme were to enter how should it price its cans? Should it enter?
- (b) (8p) There turns out to be uncertainty over whether Acme's ointment will be classified as a health product (which are tax free) or a beverage (taxed at 2 €/can). Both possibilities are considered equally likely, and the only way to find out before setting up the distribution chain would be to hire the well-connected consulting company XPols. How much should Acme be willing to pay, at most, for the services of XPols?

IV (20p) The City of Potrzebie has a Metro system and 200k commuters. The monthly total benefit of each commuter is  $TB_i(q) = 20q - 0.25q^2$  (€) if Metros run at a frequency of  $q$  trains per hour. There are also 100k Potrzebians who derive no benefit from the Metro. The maintenance cost of the system is 12 m€, and in addition the cost of providing a month of train service at  $q$  per hour is  $2q$  m€. All values in monthly present values.

- (a) (12p) What would be the efficient frequency of Metro train service in Potrzebie?
- (b) (4p) Suppose Metro travel is priced so that the variable cost of providing train service is exactly covered (by uniform pricing). What would be the frequency of service?
- (c) (4p) As in part IVb, but now also the maintenance cost must be covered by the revenue from users, so that the Metro system breaks even.