

Exam 2. Individual closed-book exam. Calculators are allowed.

Multiple choice questions (24p)

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

1. A cloud service firm has a decent idea about the distribution of customer types by their valuations for its services; it plans to sell to many types of customers but has no ability to identify customer types at the point of sale. It has set a monthly subscription fee, and a usage fee proportional to the CPU-time used by the subscriber. Its own marginal cost of providing services is wholly based on CPU-time, which it buys from another firm at a constant hourly rate. If the pricing maximizes profits then it must be the case that...

- (a) Highest valuation customers get no consumer surplus
- (b) Subscription fee equals the marginal cost of CPU-time
- (c) Subscription fee exceeds the marginal cost of CPU-time
- (d) Usage fee equals the marginal cost of CPU-time
- (e) Usage fee exceeds the marginal cost of CPU-time

2. A fishmonger is salt-curing whole salmons for the holiday season. While most of its customers traditionally buy just one salt-cured salmon, the fishmonger senses an opening for selling a bundle of two to some customers. If there are two equally common customer types with the below reservation values then how should the fishmonger price a bundle of two salmons? Marginal cost is €50/salmon.

	€	1st	2nd
Normies		150	100
Aficionados		180	140

- (a) €250
- (b) €280
- (c) €290
- (d) €300
- (e) €320
- (f) There is nothing to be gained by selling a 2-pack (at a price lower than two 1-packs)

3. Row House and Column Terrace are neighboring pubs. They are concurrently planning major renovations, where the choice of interiors will determine which customer segment they are better able to attract. The resulting profits would be:

		Column	
		€m	
Row	Cheapskates	0,0	1,3
	Showoffs	3,1	0,0

In the symmetric Nash equilibrium strategy a pub targets Cheapskates with probability...

- (a) 0%
- (b) 25%
- (c) 33%
- (d) 50%
- (e) 67%
- (f) 75%

4. Firms in an oligopolistic industry have for many years achieved price moderation via implicit collusion. Which of the following would be a threat to continued price moderation?
- (a) Adverse selection
 - (b) Increase in discount rates
 - (c) Increase in fixed costs
 - (d) Increase in marginal costs
 - (e) Moral hazard
 - (f) Signaling
5. A pure strategy can be dominated for a player even if that player has no dominant strategy. However, this is only possible if...
- (a) the game has at least three players.
 - (b) the game has at most three players.
 - (c) the player has at least three possible actions.
 - (d) the player has at most three possible actions.
 - (e) other players have at least three possible actions.
6. Which one of the factors is part of the economics of agglomeration?
- (a) Lower commuting costs.
 - (b) Higher liquidity in markets that require a pairwise match.
 - (c) Higher variety of economic activity that can meet the minimum efficient scale.
 - (d) More opportunities for learning spillovers.
 - (e) All of the above.
7. Acme has hired a new line manager Jill and is now designing an incentive contract for her. What might be observable but not verifiable?
- (a) Jill's reservation value for high effort
 - (b) The quality of Jill's managerial decisions
 - (c) The level of performance bonuses actually paid by Acme
 - (d) The level of performance bonuses promised by Acme
 - (e) All of the above
8. Bidders in a procurement auction have gathered at the city hall. Only quality-certified producers have been allowed in. The auctioneer uses a digital display that shows a number in euros that starts at zero and keeps increasing, by €1000 every two seconds. The auction ends when any bidder first raises their hand; they win the contract and obtain the currently displayed price. In economics this type of an auction is known as the...
- (a) all-pay auction.
 - (b) Dutch auction.
 - (c) English auction.
 - (d) first-price auction.
 - (e) Polish auction.
 - (f) second-price auction.

I (9p) 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) Empty threat
- (b) Installed base
- (c) Vertical differentiation

II (16p) Bonk Realtors has traditionally derived its revenue from brokerage fees. Last year the whiz kids at Bonk's data analytics team created a predictive model of house prices using Bonk's vast array of proprietary historical data on house characteristics and sales. They convinced the CEO of Bonk to enter the business of house flipping. Thus Bonk began to buy houses that were offered for brokering at an asking price below Bonk's predicted price, with the hope of selling them later at a profit. Usually Bonk was able to acquire these apparently undervalued houses, but sometimes another house-flipper would make a better offer to the seller. In sum, the new strategy resulted in a loss: the average resale price of a house bought by Bonk was in fact lower than the price it had paid. Yet there was nothing wrong with the predictive model, it continued to be on average correct about the eventual resale price of houses in the region.

What was Bonk's mistake?

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

III (24p) Many drivers in Lintukoto use studded tires in the winter for reasons of safety and comfort. The demand for studded tires is $P^D(q) = 1000 - 20q$. However, their use also causes emissions of fine particles that pollute the otherwise pristine air of Lintukoto. The resulting total damage is estimated to be $C(q) = 6q^2$. (q in thousands of tire sets, prices and costs in euros). Any amount of studded tires can be imported at 200 euros per set.

- (a) How many studded tire sets are consumed in Lintukoto? Then how large is the external cost imposed by the buyer of a studded tire set?
- (b) Describe a tax on studded tire sets that would maximize the total surplus that the population of Lintukoto obtains from studded tires.

IV (27p) The government of Ultima Thule has just reformed its system of public health centers. In the new system private companies operate health centers and citizens choose one to be their personal service provider for a year at a time. The government compensates certified companies based on the number of customers, €5k/customer per year. Quality of care is strictly regulated, and the expected cost of serving any customer is €4k/year. Customers expect a yearly travel cost of 50 €/km to the health center. Quality is the same at every center so all citizens choose their nearest one. The geography of Ultima Thule is well approximated by a line that is 120 km long, with its 120k inhabitants evenly distributed along its length. The fixed cost of operating a health center is €25m/year.

- (a) In the short run there are only two certified health care companies, and both can open only one health center. What are the locations and profits in equilibrium?
- (b) Years later the health care market in Ultima Thule has reached a long-run equilibrium. There are n competing health centers located at the midpoints of their customer segments, each consisting of a fraction $1/n$ of the population, and n is as large as possible while consistent with non-negative profits. How many health centers there are, and what are their profits?
- (c) How does total welfare change between the short and the long run?