

Retake Examination Fall 2022

You have three hours to complete the examination. The six questions have equal weight and are designed to take 30 minutes each.

1. Determine if the following claims are true or false. Explain the terms in italics and justify each answer you give with at most three sentences.
 - (a) If the price of a good fluctuates more than the quantity sold when the supply curve shifts, we conclude that demand is *inelastic*.
 - (b) In a competitive market, all firms produce up to the point where their *marginal cost* equals price and therefore they earn the same profit.
 - (c) Ann and Bob like apples and oranges, but Ann likes apples better than oranges and Bob likes oranges better than apples. Then in any *Pareto-efficient* allocation, either Ann has only apples or Bob has only oranges.
 - (d) If a farmer works on a farm that she owns and therefore gets all the production from the farm, she chooses to work longer hours than she would if she were sharecropping on the same farm, i.e. if she had to pay 50% of the production to the owner of the farm.
 - (e) If a two-player game with two actions has two *Nash equilibria*, then neither of the players has a *dominant strategy*.
2. Two countries A and B are in a conflict situation. Each country chooses simultaneously one of two possible strategies: either be aggressive (Hawk) in the conflict or adopt a peaceful attitude (Dove). If both countries are aggressive and play Hawk, a war results. If both are peaceful and play Dove, a compromise solution is reached. If one country plays Hawk while the other plays Dove, the aggressive country playing Hawk wins the conflict and gets its most desired outcome.
 - (a) Draw the game matrix for this game with payoff numbers that reflect the preferences of both countries where winning the conflict is the best outcome and the compromise is better than losing the conflict and losing the conflict is better than war.
 - (b) Does the game have dominant strategy equilibria or Nash equilibria?
 - (c) How does your analysis of the game change if the leader of country A has the option of publicly manipulating (so that this is observed in both countries) her own country's preferences so that losing the conflict is seen as a worse alternative than war?
3. A yoga studio opens a site in a small town. As the only yoga studio in its market, it would have market power, i.e. to sell larger quantities, it would have to set lower prices.
 - (a) The demand curve for memberships at the studio is $P = 45 - \frac{1}{10}Q$ for $Q \leq 300$ and $P = 0$ for $Q > 300$ where Q denotes number of memberships and P the price. Draw the demand curve for memberships at the in the (Q, P) co-ordinates (Q on horizontal axis). How many memberships can be sold at $P = 20$?

- (b) The fixed cost of running the studio is 700. A yoga instructor costs 300 to hire and each instructor can serve up to 50 members. Draw the cost curve for the studio and draw also the marginal cost and the average cost curve for the studio. Is it possible to operate the studio profitably?
 - (c) What is the marginal revenue from an added membership?
 - (d) How many instructors should be hired and what is the optimal membership price?
4. Consider a competitive market where firms can produce quantity q using a technology whose cost function is given by $C(q) = 250 + 10q^2$, for $q > 0$, $C(0) = 0$.
- (a) What is the fixed cost of the technology, what is the marginal cost?
 - (b) What is the efficient scale of production (i.e. the quantity minimizing the average cost) for each firm?
 - (c) The demand curve for the market is given by $P = 1000 - 5Q$, where Q denotes the total quantity demanded. What is the long-run equilibrium price for the market? How many firms enter?
 - (d) How does the number of entering firms depend on the fixed cost (increasing or decreasing in the fixed cost?) How does it depend on the marginal cost?
5. Consider a model of trade between two countries, Domestic (D) and Foreign (F). Manufacturing labor is cheaper in F than in D and as a result, the equilibrium price of large appliances is EUR 80 lower in F than in D if there is no foreign trade. All appliances regardless of the country where they are produced are considered to be equally good by all buyers (no home bias).
- (a) Draw the demand and supply diagrams for the two countries in two graphs that allows you to compare the price levels (as in the lecture notes). Assume that the two countries start trading, but the cost of transporting goods is EUR 60 per appliance. Consider the resulting equilibrium prices in the two countries after allowing free trade. Explain how the prices are different if the buyers in D pay the transportation cost versus if the producers pay the cost to get to the market in D.
 - (b) Suppose another country (S) exactly similar to D joins in the free trade area. The cost of transportation between any two countries is EUR 60. What happens to equilibrium prices? What can you say about the producer and consumer surplus in (D) as a result of (S) joining the free trade area.
6. A fisherman is selling fish to a local restaurant at price 15 EUR per kilo. The marginal cost of catching fish is 10 EUR per kilo. The restaurant is the only fish restaurant in town and has therefore market power. Suppose that the demand for fish (in kilos) sold at the restaurant is $P = 70 - Q$. The personnel cost of preparing and serving the fish is 25 EUR per kilo.
- (a) What is the marginal cost of preparing a fish meal (in kilos) for the restaurant? What is the profit maximizing quantity and price of meals in the restaurant? What is the profit of the restaurant assuming no fixed costs?
 - (b) What is the profit to the fisherman from selling the fish to the restaurant?
 - (c) The restaurant owner makes the following proposal to the fisherman. I will pay you a fixed amount F in addition to your cost of 10 EUR per kilo. Is it possible to find a payment F and a new sales quantity of fish so that both the restaurant owner and the fisherman are better off than in the original situation?