31E11100 - Microeconomics: Pricing

Exam, October 19, 2022

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Please answer the questions below. Answer shortly but justify your answers and explain accurately what you are doing. If you are confused about some question statement, please explain clearly what you assume when answering.

The maximum total points is 40 (which makes 40% of the total grade of the course). There is no need for a calculator.

1. (12 points) Answer the following questions verbally. Give short answers and try to be as accurate as possible.

   (a) Discuss the problem of a monopolist that produces a durable good over time. What makes dynamic price discrimination difficult for the monopolist? What kind of a commitment problem is there, and how could the monopolist solve it?

   (b) Describe the practice of third-degree price discrimination and discuss its welfare effects. How do you expect improvements in technologies that enable sellers to identify buyer types to affect revenues and consumer welfare?

   (c) There is substantial price dispersion for homogenous products in many real markets. List some potential explanations for this finding. Does price dispersion necessarily imply that some firms are making higher profits than others? How would you expect higher price dispersion to affect the willingness of consumers to pay for price information?

2. (12 points) A TV operator considers how to sell packages consisting of several TV channels to its customers. Assume that the operator has three channels available. Suppose that each buyer has either a high valuation $v^H = 6$ or a low valuation $v^L = 4$ for each of the channels,

and the total value of a package to a buyer is the sum of valuations for individual channels. These valuations are private information to the buyer. For each channel and each buyer, the probability of high valuation is $\frac{1}{2}$ and probability of a low valuation is $\frac{1}{2}$. Assume that the valuations are statistically independent across buyers and across the channels.

(a) Assume that the monopolist sells the channels individually, i.e. sets a price for each channel and allows the buyers to choose the channels they want. How does the monopolist set the optimal prices? What is the expected profit per channel? What is the expected consumer surplus?

(b) Suppose that the monopolist sells all three channels together. What is the distribution of valuations that the buyers have for this package? What is the optimal price for the package? What is the expected profit per channel? What is the expected consumer surplus?

(c) Suppose that the number of channels is large (for example 100). What would be the best way for the seller to sell the channels? You do not have to arrive at an exact optimal solution, but explain qualitatively the nature of the solution and its welfare properties.

3. (16 points) A seller sells an indivisible object and there are N potential buyers. The valuation of buyer i is denoted by v_i, and the valuations are statistically independently drawn from a uniform distribution over the unit interval $[0, 1]$.

(a) Assume that the seller uses a second-price auction to sell the object. Formalize this auction format as a game and explain how the bidders should bid in such an auction.

(b) What is the expected revenue of the seller? What is the expected surplus of the buyers? (if you have trouble doing this in the case

of N players, then do it for $N = 2$).

(c) Explain what is meaint by revenue equivalence theorem and discuss its implications in the present context. Show how you can use the revenue-equivalence theorem to derive the equilibrium bidding strategies for the buyers in a first-price auction.

(d) Let us go back to the second-price auction format. Suppose that buyer 1 can alternatively buy an identical object from another seller at price p, where $0 < p < 1$. In other words, if buyer 1 does not win the auction, he simply buys the same object elsewhere (he only wants to get one object, so in case he wins the auction he will not buy from the other seller). How should buyer 1 bid in the auction? How should other buyers bid? Is it a good or bad thing to the seller and the other buyers that one buyer has an outside option? Explain.