(Student's Name: 1 point)

Industrial Organization

Final Exam

Problem	1	2	3	4	5	6	7	Σ
Points								

Description: The exams consists of 2 analytical questions and 5 (semi) math questions. You should explain your answers in all problems. In the analytical questions you should show the ability to apply models covered in class to real world problems. Be brief, precise and to-the-point: *things that are not relevant to the problem will not receive credit*. Two extra pages can be found at the back. Next to every problem you can see the amount of points it's worth (they sum up to **99**). Be smart about your choice of problems. Good luck!

July 3, 2019

Analytical Questions (35 points)

Problem №1 *(23 points) Lyft* and *Über* are two major ride-hailing services in the US. This question will ask you to think about the competition between the two. Consider the following edited excerpt from an article published in the The Economist on April 27, 2019:

> [*Lyft* and *Uber*'s] losses are in the spotlight. In a filing released [...] Uber says it has lost $7.9bn since 2009. Lyft, which listed last month, lost $2.9bn in seven years. [...] Uber's name recognition may help. Historically, taxi firms have benefited from strong brands. London's black taxis, for instance, attract users despite high fares and relative scarcity. In an ideal world for Uber, brand awareness would mean customers went straight to its app rather than that of a rival. [...] The trouble is, as competition increases, ride-hailing becomes a commodity business. Customers care little whether they ride with Uber or Lyft, as long as it gets them from a to b. [...] Likewise, the ride-hailing firms do not own their cars: their drivers do, and so have no reason to be loyal.

a (5) *Based on the information provided in the excerpt, which model studied in class is best-suited to analyze the competition between Über and Lyft? Comment on how the assumptions of the model match the reality and how the predictions of the model match the reality.*

b (5) *Extrapolate the insights from the model you chose to the competition between the firms in the market for drivers, where both serve as buyers. What do you expect the equilibrium outcome to be in that market?*

c (5) *In the language of models covered in class, explain how a strong brand can help Über be more profitable?*

d (8) *Both companies are working to develop a driver-less taxi, in order to stop paying the drivers and cut costs. Predict what is going to happen to profits and prices if Lyft develops the technology first, and compare the outcome with the situation in which both companies develop the technology at the same time.*

Problem №2 *(12 points)* Consider an excerpt from the section of the *Horizontal Merger Guidelines* dedicated to assessing the competitive harm in industries with homogeneous products.

> In markets involving relatively undifferentiated products, the Agencies may evaluate whether the merged firm will find it profitable unilaterally to suppress output and elevate the market price. A firm may leave capacity idle, refrain from building or obtaining capacity that would have been obtained absent the merger, or eliminate pre-existing production capabilities. [...]
>
> A unilateral output suppression strategy is more likely to be profitable when (1) the merged firm's market share is relatively high; (2) the share of the merged firm's output already committed for sale at prices unaffected by the output suppression is relatively low; (3) the margin on the suppressed output is relatively low; (4) the supply responses of rivals are relatively small; and (5) the market elasticity of demand is relatively low.

Explain why (1) and any other condition of your choice makes the unilateral output suppression strategy more profitable for merging firms.

Math Questions (64 points)

Problem №3 *(12 points)* Consider a Cournot competition under demand $P(Q) = a - Q$, where $a = 11$. The market is a duopoly. Firm number 1 has $MC_1 = 1$, and firm 2 has $MC_2 = 3$.

a (4) *Suppose that firm 2 decided to produce 4 units of the good. How much should firm 1 produce?*

b (8) *Now consider the equilibrium in the market. Firm 1 receives an offer to run an ad that would increase a (in the demand function) by 3 units. How much is firm 1 willing to pay for such service?*

Problem №4 *(12 points)* Consider a game between the antitrust regulator and a group of firms. The firms can choose to collude or to compete (they are one player and make a joint decision). If the firms collude, they earn the monopoly profit, and if they compete, they *each* get the competition profit (so, as a group they get twice that). The regulator can choose to investigate the firms or not. Investigation costs 2, but if firms collude, the regulator collects triple the monopoly profit in fines. No investigation gives zero to the regulator.

a (5) *Suppose that firms have no production costs, and that they compete as in Bertrand under the demand* $D(p) = 4 - p$*. What are the competitive profits and monopoly profits?*

b (7) *Fill out the matrix of the game. If the game has any equilibria, find them.*

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Problem №5 *(16 points)* Consider a Bertrand model with demand $D(p) = 12/p^2$. There are 3 firms in the market, with marginal costs $MC_1 = 0.98$, $MC_2 = 1$, $MC_3 = 1.02$.

a (4) *Find the market power of firm 1 in equilibrium. How does it compare to the market power this firm would have, were it the only producer in the market?*

b (12) *Firms 1 and 2 announce a merger, and the DoJ wants to review it. The market is well defined. Complete the review of this merger following the Horizontal Merger Guidelines. Would the regulator be able to successfully challenge the merger? (More space on the next page)*

Problem №5 (*Continuation*)

Problem №6 *(14 points)* Consider a Hotelling model with quadratic transportation costs. The product is beer, and different brands differ in the level of alcohol content $x \in [0, 1]$. There are 4 firms. F1 sells a brand located at $x = 0$. F2 sells $x = 0.45$, F3 sells $x = 0.6$, and F4 sells $x = 1$. Firms 2 and 4 announce a merger.

a (7) *For this particular case, explain how the government would go about defining the relevant antitrust market. What are the possible market definitions it can employ?*

b (7) *Will the regulator conclude that the merger will have strong anticompetitive effects?*

Problem №7 *(10 points)* There are 2 firms in the market with demand $P(Q) = 1 - Q$. Both firms have $MC = 0.2$. Firm 1 is run by a manager who maximizes the profit of the firm (as usual). Firm 2 is run by a manager, whose contract prescribes her to maximize $TR - xTC$, where $x \geq 0$ is a parameter chosen by the shareholders. Other than that, the model is a standard Cournot: managers simultaneously choose quantities, and the price is then given by the demand. What is the level of x that maximizes the profit of the shareholders?

Problem №__

Problem №__