Economics 121: FINAL EXAM

<u>GENERAL INSTRUCTIONS</u>: Print your name on the front of each blue book that you use. Please write clearly. The exam has three parts with some choice. All together there are 150 points. Point assignments are given in the instructions for each part.

- I. <u>TRUE or FALSE or UNCERTAIN and EXPLAIN</u>: Choose <u>7 of the following 10</u> statements, decide whether each is true or false or uncertain, and then explain the reasoning behind your answer. *Be sure to state any additional assumptions you need to arrive at your conclusion*. Each is worth 6 points for a total of 42 for this part.
- 1. The Lerner Index increases as the number of symmetric Cournot oligopolists increases.
- 2. The presence of strong scope economies in two stages of production is a pro-competitive reason for vertical integration.
- 3. All else equal, it should be more difficult to enter the cellular telephone service industry when consumers are allowed to keep their phone numbers when they switched carriers compared to when they must change numbers.
- 4. A producer might rationally refuse to become a member of a cartel even if the cartel successfully deters "chiseling."
- 5. The "merger paradox" may not occur when the products of merging and non-merging firms are differentiated.
- 6. In the "chain store paradox," potential entrants in the separate markets choose not to enter because the chain store threat in one market makes its threat credible in other markets.
- 7. Because of the cost characteristics of information goods such as computer software, the Areeda-Turner test will almost never indicate predation.
- 8. Technical standards enable an industry to capture network externalities and to adopt the most efficient product technology.
- 9. The <u>more</u> firms in a Cournot oligopoly, the <u>more</u> they will spend on cost-reducing R&D, both individually and as a group.
- 10. In an industry where the incumbent has a strong incentive to pre-empt entrants by adopting a new technology, competition as envisioned by Schumpeter will not materialize.

II. <u>MULTI PART QUESTIONS</u>: Answer all of the following 4 multi-part questions. While some parts of these questions may call for a narrative, do not write a long essay. Points for each part are given in [square brackets]. This part is worth 80 points.

- 1. Consider the standard Dixit model of strategic entry deterrence: a single incumbent, threatened by a single potential entrant facing fixed entry costs, irreversibly invests in capacity, with the two firms engaging in quantity competition should entry occur.
 - a)[3] Inscribe the best response curve of the potential entrant into a diagram that represents the quantity choices of the two firms, and indicate the entrant's breakeven quantity with a "B."
 - b)[3] Using this same quantity diagram, plot and label the best-response curve of the incumbent *for a given level of capacity investment*.
 - c)[3] Starting with a new quantity diagram, carefully depict the Stackelberg equilibrium (label as "S").
 - d)[3] Using a separate quantity diagram, illustrate the case of "blockaded entry."
 - e)[3] Using yet another quantity diagram, illustrate the case of "ineffectively impeded entry."
- 2. Consider the below two-player, one-shot game, and answer each of the following questions:
 - a) [3] Explain why the pure strategy of "Cooperate" for both players is not a Nash equilibrium for the one-shot game.
 - b) [4] Identify any and all pure-strategy Nash equilibria of the game, and any and all Pareto efficient outcomes.

- c) [3] Now suppose that the game is repeated an infinite number of times. Describe the standard "trigger strategy" adopted by each of the two firms in for this repeated game.
- d) [5] Assuming the firms play trigger strategies, determine whether Firm 2 will be deterred from deviating when the discount factor is $\delta = 0.9$.
- e) [3] In general, for which of the two firms is it more difficult to keep from deviating? Carefully explain.

Firm 2					
Firm 1		Co	operate		Cheat
	Cooperate		25		35
		25		-1	
	Cheat		-1		5
		30		20	

- 3. For each of the following vertical practices, give reasons why the practice: (i) may realize vertical economies, and (ii) may harm competition in one or both of the vertical markets. Be sure to address both of these issues BEFORE going on to the next industry practice.
 - a)[7] McDonald's forces independent franchisees to purchase all of their hamburger from the corporation and yet charges them <u>more</u> than it charges stores that are wholly owned by the company.
 - b)[7] In addition to designing and building its home video game consoles, Sega develops all the games for its system, refusing the license its technology to independent game makers.
 - c)[7] Major beer brewers assign exclusive, non-overlapping territories to distributors of their brand.
- 4. Sony (firm 1) and Samsung (firm 2) both design, manufacture and sell a version of a portable DVD player. The two products are differentiated, and the demand for them is not symmetric:

$$D_1(p_1, p_2) = 1 - p_1 + p_2/2$$

 $D_2(p_2, p_1) = 1 - p_2 + 3p_1$

where D_1 and D_2 are quantities demanded of the two products, and p_1 and p_2 are their respective prices. All costs of the two firms are fixed and sunk over the time they compete.

- a)[5] Verify that Sony's best response to Samsung's price is $p_1 = r_1(p_2) = \frac{1}{2}(1 + \frac{p_2}{2})$ and that Samsung's best response to Sony's price is $p_2 = r_2(p_1) = \frac{1}{2}(1 + 3p_1)$. Plot the two best response functions is a price diagram, being certain to label all points and lines.
- b)[5] Compute the Bertrand-Nash equilibrium prices when the firms set their prices simultaneously, and compute the associated profits for each of the two firms.
- c)[6] Now suppose that Sony is a <u>price leader</u>, setting its price first while Samsung <u>follows</u> taking Sony's price as given. Compute the equilibrium price for the two firms.
- d)[3] Would you expect Sony's profits to be higher or lower when it leads compared to when the firms move simultaneously? Explain your answer.
- e)[7] Calculate the profits for Samsung when it is a follower, and compare those profits to the profit level when Sony and Samsung set prices simultaneously. Provide intuition for your results.

III. <u>INDUSTRY STUDIES</u>: Answer each of the following 2 questions. For each one, please select just <u>ONE of the THREE industries</u> that are listed below the question, and then answer the question for that industry. Each of the questions is worth 14 points for a total of 28 points.

- Choose *one of the three* industries and describe how <u>product differentiation</u> was used as a means of competition among the established firms, and also how it could have the effect of erecting barriers to new entrants into the industry: (a) Automobiles; (b) Breakfast Cereals; (c) Pharmaceuticals.
- Choose *one of the three* industries and describe <u>one practice</u> used by incumbent firms that has the effect of excluding rivals from the industry. Explain how this practice had the effect of excluding rivals and also how it could nevertheless promote efficiency in the selected industry: (a) Breakfast Cereals, (b) PC Software, (c) Pharmaceuticals.