

Economics 121
MIDTERM EXAM

GENERAL INSTRUCTIONS: Write your name and your TA's name on the front cover of each of **TWO BLUE BOOKS**. The exam has 3 parts. Put Part I and Question II.1 in one blue book, and Questions II.2 and Part III in a second. The exam is worth a maximum of 100 points. Point assignments are given in the instructions for each part. You are encouraged to check your calculations on scratch paper but be certain to put all of your answers in the bluebooks.

I. TRUE or FALSE or UNCERTAIN and EXPLAIN: Choose just 4 of the following 7 statements, decide whether each is true or false or uncertain, and then explain the reasoning behind your answer in a few sentences; provide any assumptions you may think necessary to draw your conclusion. Each question is worth 7 points for a total of 28 points. Only the first 5 that appear in your bluebook will be graded.

1. For output greater than 1, the total cost function $C(Q) = \frac{1}{2} + Q + \frac{1}{2} Q^2$ has the property that $s > 1$.
2. If production of a good exhibits learning by doing, then a scope economy arises between the product produced at different points in time.
3. A potential entrant may find it profitable to enter a Cournot oligopoly even when it has higher cost than all of the incumbent firms at every output level.
4. In a free-entry equilibrium, too many differentiated products will be supplied because each one will be produced in an amount less than its minimum efficient scale.
5. In a Cournot oligopoly, if suddenly and unexpectedly the market demand became more price inelastic, then the industry Lerner Index will rise if the industry HHI does not change.
6. If consumers take into account future sales of a good that experiences positive network externalities, the market will never face the "chicken-and-egg problem."
7. A dominant firm's residual demand curve becomes less price elastic as more firms enter the competitive fringe.

II. MULTI-PART QUESTIONS: For each of the following two questions, answer all parts. The point assignment for each subpart is given in [square brackets]. Together, they are worth 50 points.

1. [18] Advertising is a key weapon in "the cola wars." Suppose that Coke and Pepsi may choose a small (S), medium (M), or large (L) advertising budget. Their profits are given in the payoff matrix on the next page, where the lower left number in each cell is Coke's profit, and the upper right is Pepsi's.
 - a) [3] Does Coke have any dominant strategies? Does Pepsi? Explain why they are dominant.
 - b) [5] Does Coke have any dominated strategies? Does Pepsi? If so, eliminate any and all of those *dominated* strategies, and decide if there are any more dominated strategies for either firm. Be sure to explain why they are dominated.
 - c) [5] Find any and all Nash equilibria in advertising levels and for each one determine whether it is also Pareto efficient and explain why.
 - d) [5] Suppose that Coke chooses its advertising budget first, and Pepsi follows. What is the new equilibrium? Is Pepsi harmed by assuming the role of the follower? Explain.

		PEPSI		
		S	M	L
COKE	S	$4\frac{1}{2}$	3	2
	M	$\frac{1}{2}$	0	1
	L	0	1	$\frac{1}{2}$
		-1	8	5
		0	3	3

+++++ Start Your Second Blue Book +++++

2. [28] Consider the simple Hotelling model on the interval in which a monopolist owns two stores, one at each of the endpoints of Main Street, *i.e.*, at $z_1 = 0$ and $z_2 = 1$. Suppose, to begin with, that the cost of the product sold at the two stores is the same, $c_1 = c_2 = c > 0$, but that the monopolist may set different prices, p_1 and p_2 . Assume throughout that $t < \frac{1}{3}(V - c)$.
 - a) [5] Draw a diagram illustrating the Hotelling town being sure to label all points and lines. In your diagram, be sure to indicate the “effective” (or “delivered”) prices for both stores (as seen by the various customers located along the line) and give algebraic expressions for those prices.
 - b) [3] Derive the location of the “marginal consumer” as: $z = (p_2 - p_1 + t)/2t$, *assuming V is large enough and p_1, p_2 and t are small enough so that everyone in town makes a purchase.*
 - c) [6] Now let costs at the two stores differ: $c_1 < c_2$, $t < \frac{1}{3}(V - c_2) < \frac{1}{3}(V - c_1)$ Draw the Hotelling diagram again for this case, showing effective prices which will maximize the monopolist’s profits from the two stores. (Hint: choose $z = \frac{1}{2} + (c_2 - c_1)/4t$) Indicate in your diagram the profit derived from each of the two stores.
 - d) [6] Continue to assume that costs differ at the two stores, but let transportation cost t fall to zero. What happens to the monopoly prices? Does the monopolist fall victim to the “Bertrand Paradox” when setting these two prices? Explain why or why not. Would your answer change if the two stores were owned by different firms, *i.e.*, duopolists? Explain.
 - e) [4] Suppose, finally, that the location of the two stores could change. Discuss the profit incentives of moving one or both stores away from the extreme end of the Hotelling line when a monopolist owns both stores, and compare to the case when they are separately owned.

III. INDUSTRY STUDIES: Answer each of the following questions about the three industries in the first half of the course, *i.e.*, the beer, auto and breakfast cereals industries in the U.S. Point assignment is given in square brackets. This section has a total of 30 points.

1. [10] Briefly compare the time pattern of concentration in the beer and the breakfast cereal industries over the 20th century, *i.e.*, through the 1900s.
2. [10] Choose *either* the beer or the auto industry (but not both!), describe empirical evidence of scale economies in production and indicate two likely sources of scale economies.
3. [10] Now, choose *either* the auto or the breakfast cereal industry (but not both!), and give one example of a *significant competitive entry threat* into that industry. Describe how the incumbents responded to this threat and the success of the entrants and incumbents strategies.