

FINAL EXAMINATION
ECONOMICS FOR BUSINESS
(Econ 815)

May 7, 2001

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Instructions: There are two parts to this examination, weighted 40 points and 60 points, respectively. Write legibly and think carefully about your answers. You may find that graphical and/or mathematical analysis will assist you in answering some of these questions.

I. Short Answer (40 points). Answer 4 (and only 4) of the following 6 questions.

1. There are 4 identical firms in a market. Each firm has cost function of the form $C(q) = 3.5q_i$, for $i = 1, 2, 3, 4$. The market demand function is given by $Q = 100P^{-2}$. What is the price that prevails in equilibrium in this market?
2. Price Discrimination. Let the market demand function be given by $Q = 24 - P$ and the cost function be given by $C(Q) = xQ$, where $x > 0$.
 - a) Suppose that a monopolist that practices first-degree price discrimination and is able to prevent resale earns a total of \$72 in profits? What is the value of x ?
 - b) Suppose that the monopolist practices first-degree price discrimination but is unable to prevent resale. What are the monopolist's profits and the level of consumers' surplus under these conditions?
3. The CEO of Staples Discount Office Supplies claims in a recent Wall Street Journal Article that prices will be lower if the FTC approves the merger of his company with Office Depot. Let the inverse demand function be given by $P(Q) = 24 - Q$. The pre-merger cost function is given by $C(Q) = 16Q$ and the post-merger cost function is given by $C(Q) = 16\alpha Q$, where $\alpha \leq 1$. Assume that the competitive outcome prevails pre-merger and the monopoly outcome prevails post-merger. Determine the value(s) of α that must prevail post-merger in order for the CEO's statement to be credible.
4. Let the inverse market demand function be given by $P = 24 - (q + Q)$, where q is the output of the competitive fringe and Q is the output of the dominant firm. Suppose the dominant firm's cost function is given by $C(Q) = 4Q$ and the entrant's cost function is given by $C(q) = 8q$. What is the limit level of output, Q^L , and the corresponding limit price, P^L ?
5. The market demand function is given by $Q = 24 - 2P$, where Q is quantity demanded and P is price. The cost function is given by $C(Q) = 4Q$. What is the deadweight loss from monopoly?
6. Two firms want to merge. The Department of Justice approves the merger on the condition that the consolidated firm post-merger not raise prices above the level that prevailed pre-

merger. If the two firms agree to these conditions and proceed with the merger, what can the Department of Justice infer about the economic welfare effects of this merger?

II. Problems (60 points). Answer 2 (and only 2) of the following 3 questions.

1. [Merger Analysis] The Department of Justice recently approved a merger between American Airlines and TWA. Senator Kitt Bond (R- Missouri) endorsed this merger. In his opinion, it would lead to greater efficiencies and more reliable airline service in St. Louis. He also recognized, however, that it would also lead to a higher degree of market concentration at St. Louis' Lambert Field. Let the demand for air travel out of St. Louis be given by $Q = 32 - 2P + r$, where Q is quantity demanded, P is price and r is a measure of service reliability. The pre-merger cost function is $C(Q) = 8Q$ and the post-merger cost function is $C(Q) = 8\alpha Q$, where $\alpha \leq 1$. Assume that $r = 4$ pre-merger.
 - a) Suppose that the market for air travel is competitive in St. Louis prior to the merger. Determine the price, quantity and consumers' surplus that prevails in equilibrium.
 - b) Suppose that the market is a monopoly following the merger and $\alpha = 0.75$. What values of r must prevail in equilibrium in order for consumers to be no worse off from this merger.
 - c) Suppose that reliability improves by 300% (i.e., by a factor of 3) post-merger and that the market for air travel in St. Louis is a monopoly following the merger between American and TWA. For what values of α will consumers be no worse off from this merger?
 - d) What do your findings suggest about the likelihood that the merger between American and TWA will benefit consumers?

2. [Cournot Oligopoly] Let inverse market demand be given by $P = 24 - Q$, where P is price and $Q = q_1 + q_2$. The cost function for firm 1 is given by $C(q_1) = 4q_1$ and the cost function for firm 2 is given by $C(q_2) = 8q_2$.
 - a) Compute the reaction functions for firm 1 and firm 2.
 - b) Determine the equilibrium level of output, price and consumers' surplus.
 - c) Suppose that these two firms wish to merge. The Department of Justice will allow them to merge only if it believes that price will be no higher post-merger. The post-merger cost function is of the form $C(Q) = xQ$. Determine the value(s) of x for which the Justice Department will deny this merger.

3. [Price Discrimination] A monopolist serves a market with an aggregate demand function given by $Q = 36 - 3P$. The monopolist's cost function is given by $C(Q) = 2Q$.
 - a) How much profit can the monopolist generate with first-degree price discrimination if resale can be prevented? What is the associated deadweight loss relative to the competitive level of output?

- b) Suppose that the monopolist can partition its market into two separate submarkets. The demand function for submarket 1 is given by $Q_1 = 20 - 2P_1$ and the demand function for submarket 2 is given by $Q_2 = 16 - P_2$. What prices would this monopolist set if she practices third degree price discrimination? What is the level of profits that would be realized if resale can be prevented? What level of profits would the monopolist realize if resale cannot be prevented?
- c) Suppose that this monopolist must incur up-front entry costs of $\$S$ before it enters this market. What inference can you draw about the value of S if the monopolist enters the market if allowed to practice third-degree price discrimination but does not enter the market if constrained to uniform monopoly pricing? [Assume that first degree price discrimination is not an option here.]