

NATIONAL UNIVERSITY OF SINGAPORE

EC3322 Industrial Organization I

Semester 2, 2009/2010

FINAL EXAMINATION

April 29, 2010

Time Allowed: 2 hours

INSTRUCTIONS TO CANDIDATES

1. This examination paper comprises **FOUR (4)** printed pages, including this page.
2. This examination consists of **SEVEN (7)** questions. Answer **ALL** questions.
3. This is a **CLOSED** book examination. Calculators are permitted.
4. The total points for this exam is **100**.
5. Write your answers in the answer books provided **ONLY**.
6. You are not allowed to take away this question booklet from the examination hall.

Section I.

For each question, clearly write the question number and your answer in the answer booklet.

1. (5 points) For each of the following examples, indicate whether first-degree, second-degree, or third-degree price discrimination is taking place.
 - (a) (1 point) The publishers of the *Journal of Price Discrimination* charge a subscription price of \$75 per year to individuals and \$300 per year to libraries.
 - (b) (1 point) The U.S government auctions off leases on tracts of land in the Gulf of Mexico. Oil companies bid for the right to explore each tract of land and to extract oil.
 - (c) (1 point) Ye Old Country Club charges golfers \$12 to play the first 9 holes on a given day, \$9 to play an additional 9 holes, and \$6 to play 9 more holes.
 - (d) (1 point) The telephone company charges you \$0.10 per minute to make a long-distance call from Monday to Saturday and \$0.05 per minute on Sunday.
 - (e) (1 point) You can buy one computer disk for \$10, a pack of three for \$27, or a pack of 10 for \$75.
2. (5 points) Which of the following factors (there may or may not be more than one) makes collusion easier to sustain?
 - (a) Lower discount factors.
 - (b) Fewer firms.
 - (c) Price-matching agreements.
 - (d) Infinitely repeated interactions (that is, the firms play an infinitely repeated game).

3. (5 points) Suppose that a firm owns two plants. The cost function of each plant is given by $c(q) = 10q$. That is, the marginal cost of output in each plant for all levels of output is constant and equal to 10. How should the firm allocate output across the two plants in order to minimize costs?
- (a) Produce all output in one plant.
 - (b) Split production equally across the two plants.
 - (c) It does not matter how the firm allocates output.
 - (d) None of the above.
4. (5 points) GE and Honeywell proposed a merger in 2000. This merger was blocked by the EU Competition Commission. Why was it blocked?
- (a) The EU Competition Commission believed that the merger would have raised the cost of GE and Honeywell's rivals.
 - (b) The EU Competition Commission believed that the merger would have set off a wave of copy-cat mergers.
 - (c) The EU Competition Commission believed that the cost-savings resulting from the merger would not have been large enough to keep the retail price from increasing.
 - (d) All of the above.

Section II.

Answer each of the following questions. Show your workings.

5. (20 points total) The demand for a pharmaceutical company's antiviral drug in Europe is $Q_E = 80 - p_E$, and in Africa it is $Q_A = \alpha 80 - p_A$, where $0 < \alpha < 1$. The marginal cost of producing the drug is \$20. There are no fixed costs.
- (a) (5 points) Suppose initially that the company can charge a different price in each market. What prices does it charge, and what are its profits?
 - (b) (15 points) Now suppose that due to international pressure the pharmaceutical company cannot charge two different prices in these two markets. Under a uniform pricing policy, for what values of α will the company serve both markets (instead of just one)? **Note:** you do not need to use a graph to answer this question.

6. (30 points total) Consider the standard Hotelling spatial location model on the interval $[0, 1]$. A firm's product characteristics is measured by its location $x \in [0, 1]$. There are two firms and their cost function is $C(q) = 2q$ (constant marginal costs). Consumers are uniformly distributed along the interval. Each consumer purchases one unit of the product. The payoff is $V = 4 - p - d^2$ if he/she purchases a good located d units away at price p . The total number of consumers is normalized to 30. Firms compete in prices.
- (a) (15 points) Suppose that firm 1 has already set up its shop at $x = 0$, the left end of the interval. Consider the following game. In the first stage, firm 2 decides whether to enter or not, and decides where to locate its shop if it enters. Firm 2 can either set up at $x = 0$ (the same location as firm 1) or at $x = 1$. If firm 2 decides to enter, it needs to pay the setup costs 13. In the second stage, firms that are in the market compete in prices and consumers make their choices. What is the equilibrium outcome of the game? Does firm 2 enter the market? If so, where does it locate its shop (at $x = 0$ or at $x = 1$)?
- (b) (15 points) If firm 1 has two shops, one at each end of the interval, would firm 2 enter the market? If so, where would it locate its shop (at $x = 0$ or at $x = 1$)?
7. (30 points total) Suppose that the downstream market for widgets is characterized by the inverse demand curve $p = 100 - Q$. Widget retailing is controlled by the monopolist WR Inc., which obtains widgets from the wholesaler WW Inc., at a wholesale price of w_w per widget. WW Inc. obtains the widgets from the monopoly manufacturer WM Inc. at a manufacturing price of w_m per widget. WM Inc. incurs marginal costs of \$10 per unit in making widgets. WW Inc. and WR Inc. each incur marginal costs of \$5 in addition to the price that they have to pay for widgets.
- (a) (20 points) What is the equilibrium quantity of widgets sold? What is the equilibrium widget price for consumers, p , the equilibrium wholesale price w_w , and the equilibrium manufacturing price w_m ? What is the profit earned by each firm?
- (b) (10 points) Show that vertical integration of all three firms increases profits and benefits consumers.

- END OF EXAM -