

Econ 100B (Grossman)—Winter 2010
Midterm 2—Answers to free-response questions
February 18, 2010

Blue-book – 25 out of 50 pts. (2 qns., 12 pts. each + 1)

*Answer these questions in your blue-book. Show your work and intermediate steps for partial credit. Points are split equally across all sub-parts. Your score will **only** be based on the marks in your blue-book. You will not receive any credit for anything written on your exam paper. You will receive 1 point for correctly writing your name, perm number, version (A,B,C, or D), and TA's name on your blue-book.*

1. Recall Natch.com from the multiple choice part, specifically

- The desperate customer's demand for profiles is $p_d = 40 - 2q_d$
- The not-desperate customer's demand is $p_n = 20 - 2q_n$
- There is exactly one of each kind of customer
- The marginal cost of providing a profile is zero

(a) Under the pricing scheme from multiple-choice question 6—where the company sells the two packages of profiles—what are the company's profits?

Answer: Total profits are 300.

(b) What would the company's profits be if it engaged in uniform pricing (charged a single, per unit price)? How does this compare to your answer from part (a)?

Answer: Optimal uniform price is 15, Q is 15, so profits are 225. The packaging scheme yields 75 more dollars of profits.

(c) Now suppose that the information that the customers provide in their profile does provide the company with some information. Specifically, it is not enough to allow the company to perfectly price discriminate, but it does allow the company to observe whether or not the customer is desperate. What will its profits be if it sells profiles individually, but charges different prices to the desperate and non-desperate customers (that is, it engages in multi-market price discrimination)?

Answer: $MR_n = MR_d = 0$ implies $q_n = 5$, $p_n = 10$, and $\pi_n = 50$; $q_d = 10$, $p_d = 20$, $\pi_d = 200$; $\Pi = 250$, a modest improvement over uniform pricing.

(d) Which of the two non-uniform pricing schemes is better for Natch.com? Why is this surprising? (Hint: What is the role of information?) What is the explanation for this? (Hint: How is this similar to a two-part tariff?)

Answer: The package scheme is better. This is surprising because in the multi-market case, we assumed that the company had and used information (observing the type of each customer) that it was not assumed to have in the packaging-scheme case, and yet its profits are no higher. We should note, however, that with the ability to identify customers' types, the company could still do better than multi-market price discrimination. It could achieve higher profits by selling packages of 10 and 20 profiles, but since it can now identify customers, make the small package available only to the non-desperate customer. This will allow it to achieve the ideal (perfect-p.d.) profits of

300 by capturing all consumer surplus. Effectively what it is doing is to charge a two-part tariff ($p = mc = 0$; fee = entire CS), while discriminating b/w the two types.

2. Recall the duopolists with $MC = 1$ (and no fixed costs) and demand $p = 2 - 2Q$ from multiple-choice question 8.

- (a) Find the Cournot equilibrium quantity for each firm, the resulting market price, and the profits for each firm..

Answer: $q_1 = q_2 = 1/6$, $p = 4/3$ and $\pi_1 = \pi_2 = 1/18$

- (b) Find the Stackelberg equilibrium quantities for each firm, and the price, and the profits for each firm supposing that Firm 1 is the industry leader.

Answer: $q_1 = 1/4$, $q_2 = 1/8$, $p = 5/4$, and $\pi_1 = 1/16$, $\pi_2 = 1/32$

- (c) Suppose that Firm 2 figures out a way lower its marginal cost to $MC_2 = 0$. How does this affect the Cournot equilibrium quantities, price, and profits?

Answer: $q_1 = 0$, $q_2 = 1/2$, $p = 1$, $\pi_1 = 0$ and $\pi_2 = 1/2$

- (d) How does this affect the Stackelberg equilibrium (with Firm 1 still as the leader) quantities, price, and profits?

Answer: The answers are the same as for Cournot.