Econ 100B (Grossman)—Winter 2011
Midterm 2—Version A
February 17, 2011

Instructions: This is a closed-book, closed-notes exam. No calculators or electronic devices are allowed. Please turn off and put away all phones and other electronic devices. There are 8 multiple-choice questions and two free-response questions. Answer as many as you can in the time allowed. I do not expect everyone to be able to answer all questions. If you get stuck on something, I suggest moving on and coming back later when/if you have time. If you have a question, please raise your hand. Good luck!

Multiple choice – 25 out of 50 pts. (8 qns., 3 pts. each + 1)

Answer these questions on your Scantron. Your score will only be based on the marks on your Scantron. You will not receive any credit for anything written on your exam paper. You will receive 1 extra point for correctly writing your name, perm number, version (A, B, C, or D), and TA’s name on your Scantron. Exams without the version marked will be assigned the average score for all four versions.

1. Bristol owns the only liquor store in Talkeetna, Alaska. If the demand for bottles of Belvedere Vodka in Talkeetna is given by \( q = 200 - 2p \) and Bristol faces constant marginal cost of 40, what price should she set to maximize profits?
   (a) \( p = 40 \)
   (b) \( p = 80 \)
   (c) \( p = 70 \)
   (d) \( p = 60 \)

2. (continued from above) The governor of Alaska decides to help Bristol’s company, so she imposes a $20 per bottle subsidy on vodka. How does consumer surplus change?
   (a) Increase by 500
   (b) Increase by 700
   (c) Decrease by 500
   (d) Decrease by 700

3. A monopolist faces inverse demand \( p = 6 - q \) and has \( MC = q \). What are its profits if it can perfectly price discriminate?
   (a) 12
   (b) 36
   (c) 9
   (d) 6

4. The Oila Vista resort is the only place in the country where you can play luxury golf while dodging tar balls. It maximizes its profits in the local market by charging \( p_l = 18 \) for an hour of golf, and it estimates that the elasticity of demand in the local market is \( \epsilon = -9/8 \). It wants you to advise them on how to use multi-market price discrimination to make the most money off of their out-of-town customers, who can be identified by driver’s license. Assuming that their marginal cost is constant and that the inverse demand of visiting customers is \( p_v = 42 - 2q_v \), what price should the resort charge out-of-town guests?
   (a) \( p_v = 20 \)
   (b) \( p_v = 24 \)
   (c) \( p_v = 18 \)
   (d) \( p_v = 22 \)
5. Fouad’s cafe sells yogurt for $5 and granola for $3. Customers are only interested buying one yogurt, one granola, or both. In a typical hour, he’ll have one person buying both the yogurt and granola, three people buying only the yogurt and three other people buying only the granola. He surveys his customers and finds that the people buying only the yogurt would buy granola if it cost only $2 and the people only buying the granola would buy the yogurt if it only cost $3. If he were to start selling yogurt and granola together (in addition to selling them separately at the original prices) what is the optimal price of the bundle? You can assume that the cost of producing a good or creating a bundle is zero.

(a) $7
(b) $5
(c) $8
(d) $6

6. Two firms, both with $MC = 2$, compete as Stackelberg duopolists. Market demand is $p = 4 - Q$, where $Q = q_1 + q_2$. What is the equilibrium price?

(a) $p = 2$
(b) $p = 8/3$
(c) $p = 5/2$
(d) $p = 7/4$

7. Two Cournot duopolists compete in a market with inverse demand given by $p(Q) = 10 - 2Q$, where $Q = q_1 + q_2$. Both firms face constant marginal costs but, Firm 1 has marginal cost of $2$ and Firm 2 has marginal cost of $4$. Which expression gives Firm 1’s optimal output given $q_2$?

(a) $q_1^*(q_2) = \frac{3}{2} - \frac{1}{2}q_2$
(b) $q_1^*(q_2) = 4 - q_2$
(c) $q_1^*(q_2) = 2 - \frac{1}{2}q_2$
(d) $q_1^*(q_2) = \frac{3}{2} - q_2$

8. Firms 1 and 2 are Bertrand Duopolists. Firm 1 has $MC_1 = 1$ and Firm 2 has $MC_2 = 2.01$. The demand for their product is $p = 7 - Q$, where $Q$ is the total quantity demanded. What are the profits of each firm in equilibrium. Assume that prices can only be set to the nearest cent (e.g. $5.68$ is allowed, but $5.6873723$ is not.

(a) $\pi_1 = 5$ and $\pi_2 = 0$
(b) $\pi_1 = 0$ and $\pi_2 = 0$
(c) $\pi_1 = 4.5$ and $\pi_2 = 4.5$
(d) $\pi_1 = 9$ and $\pi_2 = 2.97$
1. A monopolist sells exclusively to Freya, whose demand is given by \( p = 15 - 2q \) and has \( MC = q \) (and no fixed cost).

(a) Find the profit maximizing price, \( p \), and quantity, \( q \).

(b) What are the monopolist's profits, the consumer surplus, and the deadweight loss?

(c) If the monopolist used a two-part tariff, instead of a uniform price, what would be the optimal per-unit price, \( p \), fee, \( f \), and quantity, \( q \).

(d) What are the profits, consumer surplus, and deadweight loss under the two-part tariff? Very briefly discuss how your answers are similar or different to those for the uniform-pricing scheme.

2. Two firms compete as duopolists, face market demand given by \( P = 4 - Q \), and both have \( MC = 1 \).

(a) Find the market price, \( p \), and total industry quantity, \( Q \), predicted by the Bertrand model of duopoly.

(b) Find the market price, \( p \), and total industry quantity, \( Q \), predicted by the Cournot model of duopoly.

(c) State whether the overall welfare predicted in the Bertrand model is higher, lower, or the same as that predicted by Cournot, with a very brief explanation.

(d) Now suppose a third firm enters the market. It is identical to the other two firms in all respects. What is the new price, \( p \), and total quantity, \( Q \) predicted by Bertrand model?

(e) What is the new price, \( p \), and total quantity, \( Q \), predicted by the Cournot model?

(f) State whether the change in overall welfare in response to the new competitor that is predicted by the Bertrand model is greater, smaller, or the same as that predicted by Cournot, with a very brief explanation.