
Second Quiz, Econ 100B, May 2006

You will not need a scantron. Fill in all your answers on this sheet. For each true-false or multiple choice question, a correct answer is worth 5 points, an answer left blank is worth 2 points. Blank answers in the fill-in-the-blanks section are worth 0.

True-False Section

- 1 A monopsonist's market power enables him to hire labor at a marginal cost that is lower than the wage rate. **False**
- 2 A coal producer has a monopoly on coal. A different monopoly controls the railroad that takes the coal to market. Each monopolist chooses prices to maximize its profits. If the coal monopolist buys the railroad then it will increase its profits by raising the market price of coal. **False**

Multiple Choice Section

Circle the correct answer.

- 3 A monopolist faces the inverse demand function described by $p = 50 - 4q$ where q is output. The monopolist has no fixed cost and his marginal cost is 5 at all levels of output. Which of the following expresses the monopolist's profits as a function of his output?
- a) $50 - 4q - 5$
 - b) $50 - 8q$
 - c) $50q - 4q^2 - 5q$ **Correct Answer**
 - d) $50q - 4q^2 - 5$
 - e) None of the above.

Fill-in-the-blanks Section

4 (30 points) The demand curve for bean sprouts is given by the equation $P = 190 - 5Y$. Every firm in the industry has a total cost function $C(Y) = 10Y$.

- a) If the industry is perfectly competitive, the total quantity sold will be

36 units and the price will be **\$10**

b) Suppose that the industry has just two firms and they operate as Cournot duopolists. Write an equation for the reaction function of Firm

1, expressing Firm 1's output as a function of the output of firm 2. $Y_1 = 18 - (Y_2/2)$

c) Find the Cournot equilibrium output for each of the two firms. $Y_1 =$

$Y_2 = 12$ What is the Cournot equilibrium price? **70**

d) If the two Cournot duopolists decided to collude and split the profits equally between themselves, how much total output would they produce?

18 units . What would be the price? **100**

e) Suppose that one firm acts as a Stackelberg leader and the other as the follower. How much would the leader produce? **18 units** How much would the follower produce? **9 units**.

5 (10 points) Victoria and Albert are roommates. They each have two possible strategies. One is to be noisy and the other is to be quiet. Each likes to make noise but each is bothered by the other's noise. The payoff matrix for the game that they play is given below

Quiet or Noisy

		Victoria	
		Quiet	Noisy
Albert	Quiet	5, 5	1, 8
	Noisy	8, 1	3, 3

a) What is Albert's payoff if he is quiet and Victoria is noisy? **1**

What is Victoria's payoff if she is noisy and Albert is quiet? **8**

b) How many Nash equilibria does this game have? **1** Which (if any) of the outcomes of this game are Nash equilibria? **Both are noisy is the only Nash equilibrium.**

6 (15 points) Malcolm Mush has written a smarmy new self-help book. His publisher estimates that demand for this book in the U.S. is $Q_1 = 102,000 - 1,000P_1$ where P_1 is the price in the U.S. and the demand for the book in England is $Q_2 = 52,000 - 1000P_2$ where P_2 is the price of the book in England (measured in U.S. dollars). The publisher's costs include \$100,000 for typesetting and editing, a \$1 royalty to the author for every book sold, and \$1 production and handling cost for each book sold.

a) Assuming that books sold in England can not be resold in the US, what price should the publisher charge in the US? **\$52** What price should the publisher charge in England? **\$27**

b) What is the price elasticity of demand in the US when the publisher charges the profit maximizing price in the US. ? **-1.04** What is the

price elasticity of demand in England when the publisher charges the profit maximizing price in England? **\$-1.08**

c) Suppose that Malcolm Mush had negotiated a royalty of \$11 per book sold instead of just \$1 per book sold. How would this affect the profit maximizing price for the publisher to charge in each country? **Price would be \$5 higher in each country.**

7 (20 points) Stringbean Hollow is a long narrow town that stretches for 20 miles along the highway. Mario's Pizza is the only pizza store in town and it is located in the exact middle of town, 10 miles from either end. The population is uniformly distributed along the highway with a density of 50 families per mile. Each family in Stringbean Hollow will consume 1 pizza per week if the total cost of a pizza, including the cost of delivery is \$15 or less. Nobody will buy a pizza from Mario if the cost, including delivery, is greater than \$15. The marginal cost to Mario of producing a pizza is \$5. Mario also has fixed costs of \$1000 per week. The cost to Mario of delivering a pizza to a customer is \$1 per mile of distance from Mario's store to the customer's house. Customers are not allowed to pick up pizzas themselves.

a) Suppose that Mario sets a price of \$12 for a pizza and in addition, he charges \$1 a mile for delivering the pizza. How many pizzas will he sell per week? (Don't forget that Mario has customers living in both

directions from his store.) **300 pizzas** Let $D(p)$ be the number of pizzas that Mario will sell if he charges price p for a pizza plus \$1 per mile for delivery. Write an equation for the demand function,

$$D(p). \quad D(p) = 1500 - 100P$$

b) If Mario charges \$1 per mile for delivery, what price should he charge to maximize his profits? (Hint: Notice that the revenue he gets from his delivery charges exactly offsets his delivery costs.) **\$10** How many

pizzas will he sell per week? **500** What are his weekly profits?

\$1500

c) Suppose that Mario decides instead to offer "free delivery" to every family in town. He sets a price for a pizza and will deliver to everyone in town, regardless of how far away they live. How many pizzas will he sell per week if he sets the price at \$10 with free delivery? **1000**

pizzas . How many pizzas will he sell per week if he sets the price

at \$15 with free delivery? **1000 pizzas** Given that he offers free delivery, what is the profit maximizing price for him to charge for a pizza.

\$15

d) Which will result in higher profits for Mario, charging \$1 per mile for delivery, or setting a fixed price and offering free delivery? Explain **Free delivery will give him higher profits. This enables him to act as a perfectly discriminating monopolist, collecting the entire willingness to pay from every consumer. Since the most distant consumer lives 10 miles away, the cost to Mario of supplying a pizza to every consumer is less than the price \$15 that he charges.**

8 (15 points) Gargantuan Enterprises is a large firm located in Pantagruel, which is a company town. There is no other industry in Pantagruel and the labor supply equation is $W = 5 + (L/5)$ where W is the daily wage rate and L is the number of workers employed. Gargantuan sells handmade goods whose only input is labor. The production function is $Q = 20L$ where Q is daily output and L is the number of workers used each day.

(a) Write an expression for Gargantuan's daily expenditure on labor as a function of its daily output, Q . **Labor cost = $WL = (5 + (Q/100)) Q/20 = Q/4 + (Q^2/2000)$**

(b) Write an expression for the marginal cost of producing an extra unit of output per day. **$1/4 + Q/1000$**

(c) Suppose that Gargantuan is a competitor in the final goods market and can sell as many units as it wishes at a price of 10.25 per unit. How many units or output per day should Gargantuan produce in order to maximize its profits? **10,000**