

The Ohio State University
Department of Economics
Final Examination

Econ 501.02
Winter 2007
Prof. James Peck

Directions: *Answer all questions, show all work, and label all graphs.*

1. (10 points) True or false, and explain:

If a firm is producing the most output that its technology will allow it to produce with the inputs it has, then the firm is producing that output at minimum cost.

2. (10 points) True or false, and explain:

In a perfectly competitive industry, it is possible for a firm to receive negative economic profits in the short run equilibrium, but not in the long run equilibrium.

3. (10 points)

Explain how the elasticity of demand influences the size of the deadweight loss associated with a per-unit tax. Will the deadweight loss be higher for a good in which the demand is highly elastic or highly inelastic?

4. (10 points)

At the local (monopoly) country club, the members are avid golfers who also like to do business deals at the golf course. Members typically play golf 5 times a year for dealmaking and 25 times a year for fun. They value a fun round of golf at \$100 and a dealmaking round of golf at \$1000. The country club's marginal cost of providing a round of golf is \$20. Explain how the country club can effectively price discriminate by charging a yearly membership fee in addition to the fee for each round of golf. What would be the membership fee and what would be the fee for each round? (Note: there is more than one correct answer.)

5. (30 points)

Suppose the market for X-Box controllers is perfectly competitive, and all firms have the production function,

$$x = \frac{1}{2}K^{1/2}L^{1/2},$$

where x is the quantity of X-Box controllers produced by one firm, K is the capital input, and L is the labor input. The market demand curve for X-Box controllers is given by

$$X^d = 24,000 - 500p_x.$$

The price of labor is nine, $w = 9$, and the price of capital is four, $r = 4$.

- (a) Calculate each firm's long run total cost function (total cost as a function of x).
- (b) Calculate the long run equilibrium values of p_x and X^d .
- (c) If we are in long run and short run equilibrium, and a firm is producing 300 X-Boxes, what is the equation for its short run supply curve? (Assume that capital is the fixed input in the short run.)

6. (30 points)

Robin and Phil are rival ticket scalpers for the big game. They know that the market demand curve for tickets is given by

$$X^d = 1200 - 10p_x,$$

where X^d is the number of tickets demanded and p_x is the price charged by both sellers. There are no costs other than the cost of acquiring the tickets. Robin is able to acquire as many tickets as she wants at a "cost" of \$20 per ticket, and Phil is able to acquire as many tickets as he wants at a "cost" of \$40 per ticket. Because the quantity of tickets to acquire must be chosen before gameday, we can reasonably assume that *this market is characterized by (Cournot) quantity competition.*

- (a) *Find the Cournot-Nash equilibrium quantities chosen by Robin and Phil.*
- (b) *In the Cournot-Nash equilibrium, what will be the price, and what will be each seller's profit?*
- (c) *What quantities would Robin and Phil acquire in order to maximize total social surplus (the sum of consumer surplus and producer surplus)?*

Note: If you get stuck on (a) or (b), you can still answer (c).