

Economics 335 Final Exam
Spring 2002
(25 points)

NAME: _____

1. (2 points) Suppose that a firm in a perfectly competitive market has the following production function: $f(x_1, x_2) = 3x_1 + x_2 - 0.2x_1^2 - 0.1x_2^2$, where x_1 and x_2 are input quantities. The price for the firm's output is \$10.00, the price for the first input, x_1 , is \$2.00 and the price for the second input, x_2 , is \$1.50. How much of each input should the firm purchase in order to maximize its profits?

2. (2 points) Consider the cost function $C(q) = F + q + 0.25q^2$, where F is a fixed cost and q is the quantity produced. At what value of q is the (total) average cost of production minimized?

3. (2 points) Competitive markets do not allocate resources efficiently when there are externalities present. Explain why this is the case.

4. (5 points) Suppose that there was a single hog packing plant operating in a market. This firm is the only buyer of hogs and the only seller of processed pork products. The firm is thus a monopsonist in the purchase of live hogs and a monopolist in the sale of processed pork. For simplicity assume that there is no waste from processing live hogs into processed pork products. Thus we can define the quantity of hogs and the quantity of processed pork products simply as q . The inverse demand for pork (from consumers) is $P(q) = 100 - q$. The total cost of slaughtering and processing pork is $c(q) = 100 + 0.25q^2$, and the inverse supply of live hogs in the region is given by $w(q) = 2 + 0.5q$, where $w(q)$ is the price that growers must be paid for them to supply q units.

Calculate (i) the profit maximizing quantity for the packing firm, (ii) the profits of the packing firm, (iii) the price paid to live hog growers, (iv) the price in the consumer market for processed pork, (v) the socially efficient quantity of hogs/pork, and (vi) the dead weight loss.

HINTS: Parts (v) and (vi) are more difficult, do not use up too much of your time trying to solve them. And, if you have no idea how to proceed, describe in words how you might solve this problem.

5. (2 points) Suppose that there is a single incumbent firm in a market. The incumbent currently enjoys a monopoly. Another firm is contemplating entry. This firm, the potential entrant, must build a production facility before production begins, and this will take time. The incumbent has an advantage; because it is active in the market, it observes the true strength of the consumer demand. The potential entrant on the other hand has imperfect information about consumer demand. The only way that the potential entrant can learn about the true strength of consumer demand is by observing the incumbent's price and sales choices.

The incumbent has decided to produce more than the profit maximizing quantity in order to deter further entry into its market. Explain how this strategy might deter entry in this setting, and describe the conditions under which it is an optimal strategy for the incumbent to pursue (in other words, carefully describe the benefit and cost of pursuing the strategy).

6. (2 points) Explain why price discrimination is not possible when consumers are able to resell the product that is being sold under discriminatory pricing.

7. (2 points) Explain why a Cournot Duopolist has an incentive to reduce its own output quantity when its rival's output quantity increases.

8. (2 points) Suppose that US Government imposes a tax on the use of fertilizer used in agriculture production. What effect will this have on the value of land in Iowa?

9. (2 points) Consider the following game which is known as the Battle of the Sexes. A married couple wants to go on a date on a Friday night. They decided on Thursday that they will attend either a hockey game or an art opening but did not finalize their plans as to which event they would attend. Above all, they want to be together but the woman would prefer to see the art opening and the man would prefer to attend the hockey game. It is now Friday and each must decide which event to attend. The problem is that the phone lines are down (use your imagination) and the couple is unable to communicate in order to finalize their plans. The following matrix describes the game.

		Woman	
		Hockey Game	Art Opening
Man	Hockey Game	3,2	1,0
	Art Opening	0,1	2,3

Do the players of this game have a dominant strategy? _____ If so what is it? _____.

Does this game have a Nash equilibrium? _____ If so, what is it (or what are they)?

10. (2 points) Suppose there are three firms operating in a market with no further threat of entry. Explain why (i) these firms have an incentive to collude, and (ii) why collusive agreements are unstable.

11. (2 points) Iowa state legislators have decided to raise tuition in order to raise revenues at ISU. Basic economics suggests that an increase in price (tuition) will cause a reduction in demand (enrollment), which could reduce revenues for the university. Explain how a tuition hike can increase revenues at ISU.