
Please answer the three questions! The exam has a maximum of 20 (twenty) points.
This is an in-class closed book exam.
Don't forget to write your name and Student ID number on all the answer sheets.
You have 3 hours (maximum limit) to finish this exam.
I should have your grades then ready next Monday. Good luck!

Question 1. (6 points)

a) (2 points) A monopolist faces the inverse demand curve

$$p = a - \frac{bQ}{\alpha + 1}$$

where α is the level of advertising, P is the price, Q is quantity, and a and b are demand parameters. Its marginal cost of production are constant and equal to w.

(i) Show graphically as well as analytically what happens to price, quantity, revenue and production costs if the firm raises its level of advertising from $\alpha=0$ to $\alpha=1$.

(ii) Under what conditions is advertising by the monopolist profitable?

b) (2 points) For goods of uncertain quality, so as long as either the seller or the buyer can determine the quality prior to the sale, there will be efficient consumption. Is the previous statement correct?

c) (2 points) In markets with more firms, when there are search costs for consumers, the prices can be higher than in markets with a smaller number of firms. Is the previous statement correct?

Question 2 (6 points)

a) (2 points) Briefly, why is vertical integration preferred to vertical separation for productive activities that require the use of relation-specific investments?

b) Multiple dealerships with exclusive territories is the focus of this exercise. Suppose there is a single manufacturer of a certain good that has marginal cost of production c and sells the good to N dealers at the same wholesale price w. These N dealers then distribute the product and sell it to final consumers at price p and provide services, s, that increase the sales of the product. Each of these distributors is an exclusive dealer over a certain territory and faces a local demand

$$q = (a - bp)s^d$$

where a, b and d are demand parameters that are identical to all retailers and $0<d<1$.

Suppose retailers choose p and s to maximize their profits. Each unit of services provided costs them $1. The dealers have no additional costs other than the service costs and the wholesale price they have to pay to the manufacturer.

(i) (2 points) What level of s and p does each retailer choose given w?

(ii) (1 point) What w does the manufacturer chose for d=1/2?

(iii) (1 point) For general d, given that the derived demand faced by the manufacturers is given by

$$q(w) = \frac{a - bw}{2}\left(\frac{d(a-bw)^2}{4b}\right)^{\frac{d}{1-d}}$$

please show how the optimal w changes with increases in d? (Hint. From the manufacturing profit maximizing FOC you get optimal w as a function of d…)

Question 3. (8 points)
In a case against Alcoa, the United States' courts considered whether Alcoa had monopolized the market of aluminum by acquiring scarce bauxite (aluminum ore) deposits and avoiding, by doing so, the entry of potential competitors. Suppose Alcoa is the only established producer (incumbent) as a result of its ownership of a bauxite deposit. There is another single firm that is a potential entrant in the production of aluminum.
Suppose further that demand of aluminum, in millions of tons per year, is given by $X=100 - 0.1\,P$, where P is the price of aluminum in dollars per ton.
Each bauxite deposit has the capacity to produce 100 million tons per year indefinitely at a cost of $100 per ton.
Assume that at a date t=0 a single new bauxite deposit is discovered and is sold to the highest bidder. Geologists are certain that this is the only new bauxite deposit that will ever be discovered. The purpose of this exercise in the end is to determine who is likely to bid the highest for the deposit, Alcoa or the entrant.
Assume that bidding occurs at time t=0.

a) (1 point) What is Alcoa's monopoly profit at time t= -1, before the new deposit is discovered? Is Alcoa producing below capacity?

b) (1 point) If Alcoa bids "B_a" and wins what are its Present Value of Profits of winning, that you can denote by π^w ? (If you have not solved a) denote monopoly profit by M).

c) (1 point) Assume that there are no other entry costs besides the bid. Assume that if the entrant wins and enters they will compete in a Nash-Cournot game. In each

period, what are Alcoa's and the entrant's duopoly profits, assuming that the entrant has access to the same technology as Alcoa?

d) (1 point) What are the entrant's Present Value of Profits if he bids "B_e", wins and enters? (If you have not solved c) denote each firm's duopoly profits as D)

e) (1 point) At least how much should Alcoa's bid be to overbid the entrant and win the deposit? (If you do not have numerical values, write it in terms of M and/or D)

f) (1 point) What do you conclude: does or does not Alcoa want to win the bid and deter entry? Note that B_a=0 is equivalent to not deterring, that is, to accommodating.

g) (2 point) If the two firms would be competing in prices instead of quantities, explain why the incumbent Alcoa always wins the bid and acquires the bauxite deposit.