UNIVERSITY OF LONDON

279 0099 ZA

BSc degrees and Diplomas for Graduates in Economics, Management, Finance and the Social Sciences, the Diploma in Economics and Access Route for Students in the External Programme

Industrial Economics

Tuesday, 30 May 2006 : 2.30pm to 5.30pm

Candidates should answer **FOUR** of the following **EIGHT** questions. All questions carry equal marks.

1. Consider the following model of a vertical relationship between a buyer and a seller. There are two periods and the two parties can, if they wish, trade one unit of an indivisible good in period 2. Let v denote the value of the good to the buyer, c the production cost, and p the trading price. Assume that $c < 1/2$. Both c and v are commonly known at the beginning of period 2. The seller can invest in period 1 to increase the value of the good to the buyer (for instance, he can spend on R&D to increase the quality of the product). In particular, $v(I) = 3I - I^2/2$. The level of investment I cannot be specified in a contract because it is not verifiable and therefore such a contract would not be enforceable in court.

    (a) What is the efficient level of investment?

    (b) In the absence of any contract, what is the level of investment chosen by the seller if the ex post surplus is to be divided equally between the two parties? Explain why this level is not efficient.

    (c) Suppose that the parties sign a contract which gives to the *seller* the right to choose the trading price in period 2 (i.e. after the investment has been made). What will be the level of I chosen by the seller? Explain the intuition for this result.

2. Untel and Cyrox are two firms that provide computer chips. Market demand is given by $P = 120 - 20Q$, where Q is the total quantity (in millions) of chips bought. Both firms have a constant marginal cost. However, Untel can produce the chips more cheaply than can Cyrox. Marginal cost at Untel is £20, while at Cyrox it is £40.

    (a) The two firms agree to form a cartel. What will be the profit-maximising output in total? How much will be produced at each firm? What will be the profit earned by each?

    (b) Suppose the cartel broke down and Bertrand competition emerged after the breakdown. What would output be at each firm? What would be the industry price? What would be the profit of each firm?

    (c) Reconsider question (b), but assume Cournot competition instead of Bertrand competition.

    (d) Comment in general on the effect of cost asymmetries between firms on cartel stability.

3. Assume a franchise is to be auctioned off. Market demand is $Q = 100–P$, where Q is the quantity of the good demanded when the price is P. Suppose there are just two firms competing for this franchise. Firm 1's cost function is $C_1 = 100+q_1$ and firm 2's cost function is $C_2 = 12q_2$. The franchise is auctioned off using an auction where the firm offering the lowest price per unit of service wins the franchise.

    (a) Who will win the franchise and what will the winning bid be?

    (b) Now suppose the government decides to issue the franchise to the firm that offers the largest lump sum fee to the government. An English auction is used where the firm offering the largest payment to the government wins the franchise. The franchise owner is then free to charge any price per unit. Who will win the franchise and what will the winning franchise fee be?

4. Two firms, one in Great Britain and the other in France, act as Cournot competitors in supplying mussels to Belgium. The demand for mussels in Belgium is $p = 100 – 2Q$. Marginal production costs for both firms (including shipping) are 25.

    (a) Calculate the Cournot equilibrium in Belgium and the profits of the two firms on their exports.

    (b) Now the French government agrees to subsidise French mussel producers at a level of s per unit. Recalculate the Cournot equilibrium. What is the optimal subsidy that the French should introduce?

    (c) What happens if the British government decides to do the same?

5. What are the main similarities and differences between models of "horizontal" and "vertical" product differentiation? Give examples and discuss the implications in terms of expected market structure.

6. "Vertical restraints can be used to increase efficiency in a market, but they may also restrict competition." Discuss, with reference to theory as well as any relevant empirical evidence.

7. An industry is made of an upstream monopolist and by two different downstream firms, 1 and 2, that buy from the monopolist an essential input. Downstream firms have a unit cost $c_1 = 0.1$ and $c_2 = 0.2$ on top of the unit price they have to pay to the monopolist. Final demand is given by $p = 1 - q_1 - q_2$. Consider the following game: first the monopolist sets the unit input price, then downstream firms compete in quantities.

   (a) Solve the game when the upstream monopolist cannot price discriminate between the two downstream firms.

   (b) Show that if the monopolist can price discriminate (i.e. set two different input prices for the two downstream firms), then the monopolist's profits are increased, consumer surplus is unaffected but overall welfare is decreased. Explain your results.

   (c) What would you conclude on the effects on a ban on price discrimination? How would your conclusions change if the monopolist can set two-part input prices?

8. "Price-cap regulation is more efficient than rate of return regulation". Discuss this statement, with reference to an economic analysis of the links between type of regulation, incentives of regulated firms to reduce costs, allocative efficiency, and productive efficiency.

END OF PAPER