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UNIVERSITY OF LONDON

279 0099 ZB

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.

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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. Answer both parts:
 - (a) Consider a market with two quantity-setting firms producing a homogeneous product. The inverse demand function is given by $p = 1 - q_1 - q_2$ and the two firms have constant marginal costs c_1 and c_2 such that $c_1 + c_2 = 2c$, where c is a constant. Compute the Cournot-Nash equilibrium. Then show that as the two firms become more asymmetric (i.e. c_i moves away from c), total industry profit increases. Finally, compute an index of concentration in this market and show that it increases as the two firms become more asymmetric.
 - (b) A researcher has estimated a model of industry profitability using cross-industry data and has found a positive coefficient on the concentration variable. He claims that the results show that higher concentration leads to higher industry profit. What is the theoretical basis for this claim? Do you agree with this conclusion? What would your advice be to a policy maker worried about the high level of concentration in many industries?

3. Discuss how tacit collusion between firms may be sustainable as an equilibrium when firms interact repeatedly. Explain how this analysis may help clarify some of the conditions facilitating or hindering collusion. What do you think are the policy implications of the analysis?

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4. Answer both parts:
- (a) There are two consumers willing to buy a product. Consumer 1 values the product at £1000 if he can obtain it this year and only £500 if he has to wait until next year. Consumer 2 values the product at £100 whether she buys now or waits to buy until next year (ignore discounting). Assume the seller can only set a single price each year, and that the firm wants to sell to consumer 1 this year and to consumer 2 next year. What are the highest prices the firm can set in each year?
 - (b) In 2005 Ford UK introduced policy a promising to reimburse customers who bought immediately for any price cut they might introduce in the following year. What effect would this policy have on Ford's profitability?
5. Suppose two operators offer differentiated services and compete in the telecommunications market. Using reaction curves, analyse how a price cap imposed on one of the two firms affects the equilibrium. Discuss, in general, the advantages and disadvantages of price cap regulation.
6. 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?

7. Suppose there are three identical firms thinking about entering a market in which there is no incumbent firm. There is a small but positive cost of entry F . The product is homogeneous, with inverse demand $p = 1 - Q$, where Q is aggregate quantity. Unit cost is zero.
- (a) Suppose the firms compete in prices if they enter. Determine the number of firms that enter, and compute the equilibrium price and profits per firm.
 - (b) Suppose that firms compete in quantities if they enter. Determine the number of firms that enter, and compute the equilibrium price and profits per firm.
 - (c) How does the equilibrium in (b) change if $F = 1/10$?
 - (d) Comment more generally, and with reference to empirical evidence, on how the equilibrium level of concentration depends on the size of the sunk cost and the intensity of price competition.
8. Explain the rationale for government policy toward research and development in the form of (i) a patent system, and (ii) R&D subsidies. Then discuss the advantages and disadvantages of these policies, with reference to any relevant empirical evidence.

END OF PAPER

