EC2084 Finalist

UNIVERSITY OF WARWICK

Summer Examinations 2018/19

Industrial Economics 1: Market Structure

Time Allowed: 2 hours.

Answer **ALL THREE** questions from **Section A** (20 marks each), and **FIVE** out of **SIX** questions from **Section B** (40 marks in total). Answer Section A questions in one booklet and Section B questions in a separate booklet.

Approved pocket calculators are allowed.

Read carefully the instructions on the answer book provided and make sure that the particulars required are entered on each answer book. If you answer more questions than are required and do not indicate which answers should be ignored, we will mark the requisite number of answers in the order in which they appear in the answer book(s): answers beyond that number will not be considered.

Section A: Answer ALL THREE questions

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1. Two firms, Firm 1 and Firm 2, compete in quantities. Demand for Firm 1 is:

$$p_1 = 120 - q_2 - 2*q_1,$$

while demand for Firm 2 is:

$$p_2 = 120 - q_1 - 2*q_2.$$

For simplicity, let us assume that firms have zero costs.

(a) Suppose firms compete for one period. What is the equilibrium? Please explain. **(6 marks)**

(b) Suppose firms have the objective to maximise joint profits (i.e., the sum of their profits). What is the optimal choice of q_1 and q_2? Please explain. **(6 marks)**

(c) Now suppose that firms interact for an infinite number of periods and try to sustain a collusive scheme. What strategy could they adopt? Describe a collusive equilibrium and explain under what condition(s) it can be sustained. You should also assume that firms discount future profits with discount factor δ. **(8 marks)**

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2. Consider a cinema, operating as a monopolist. Suppose that there is a unit mass of consumers, with taste parameter θ uniformly distributed between zero and one, $0 \leq \theta \leq 1$. We are going to consider two possible scenarios regarding consumers' preferences. In scenario A, if a consumer of type θ goes to the cinema, he has utility equal to $\theta - p$, where p is the price of the ticket. The utility is zero otherwise. Assume the cinema has zero costs, for simplicity.

(a) Derive the demand for the cinema in scenario A. **(3 marks)**

(b) What is the profit-maximising price for the cinema in scenario A? **(3 marks)**

Now we consider a different scenario (scenario B): we still assume there is a unit mass of consumers, with taste parameter θ uniformly distributed between zero and one, $0 \leq \theta \leq 1$. In scenario B, consumers prefer the cinema not to be too crowded. In particular, if a fraction α of consumers goes to the cinema, a consumer of type θ has utility $(1-\alpha) * (\theta) - p$ if he goes to the cinema, and zero otherwise. Assume the cinema has zero costs.

(c) Derive the demand for the cinema in scenario B. **(7 marks)**

(d) What is the profit-maximising price for the cinema in scenario B? **(3 marks)**

(e) In which scenario, A or B, does the cinema make higher profits? Explain. **(4 marks)**

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3. Consider a market with only one Incumbent (player I), which might face competition from a potential entrant (player E). Market demand is given by $Q=1-P$, where P is equal to the minimum of p^I and p^E. In other words, we assume all demand goes to the firm with the lower price when the firms' prices differ. Moreover, we assume that when both firms set the same price, all the demand goes to Player E. Production costs are assumed to be zero. However, if player E enters the market, he has to pay an entry cost $F = 1/5$. Finally, you can assume that the potential entrant will enter only if it expects to make positive profits.
The timing of the game is as follows: first, player I decides p^I. Then, the potential entrant observes p^I and decides whether to enter and, if it enters, it decides its price p^E.

(a) Consider player E. Conditional on entering, what price will it set? (Hint: the answer is a function of the observed p^I) **(6 marks)**

(b) What is/are the equilibrium/equilibria of the game? Explain. **(7 marks)**

(c) Consider the following alternative timing: first, player E decides whether to enter. After observing E's decision, player I decides its price p^I. Finally, if player E decided to enter in the first stage, he observes p^I and chooses p^E. What is/are the equilibrium/equilibria of this game? **(7 marks)**

Section B: Answer FIVE questions.
Please use a separate booklet.

In each case, decide whether the statement is **True**, **False**, or **Uncertain**. Explain the reason for your answer (**one or two sentences**). Most or all of the credit will be given for the explanation.

4. In perfectly competitive markets, firms make positive profits. **(8 marks)**

5. Consider a firm with an upstream division producing computer chips, and a downstream division producing computers. Initially, at time 1, there is no outside market for the firm's chips. The firm sets the transfer price optimally at P=200. This results in production of 300 computers. Later, at time 2, an outside market develops for the firm's chips. The market is willing to pay 100 for the firm's chips. Suppose the transfer price is set optimally at time 2.
The firm's downstream division will produce more computers at time 2. **(8 marks)**

6. A new firm just started production. If its manager expects costs to reduce in time due to economies of learning, it should increase the quantity produced in the present period, to have lower costs in the future. **(8 marks)**

7. If firms expect to compete on prices, they prefer to design products with the highest possible differentiation. **(8 marks)**

8. A firm competing in quantities might have a strategic advantage if it underinvests in capacity. **(8 marks)**

9. Consider the Cournot model of competition. A policy maker interested in total welfare might want to increase the cost of entry for potential entrants. **(8 marks)**