EC2083 – NON FINALIST

UNIVERSITY OF WARWICK

Summer Examinations 2015/2016

Industrial Economics 1: Market Structure

Time Allowed: 1.5 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.

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 THREE Questions

1. Consider a market operated by three firms. The three firms engage in Cournot competition. Market demand is $p(Q)=20-2Q$ where Q is total industry output, $Q=q_1+q_2+q_3$. The marginal production costs are given by: $c_1=c_2=2$ and $c_3=0$.

   (a) Derive the equilibrium price, and the output and profits of each firm**. (5 marks)**

   (b) Suppose two of the three firms, firm 1 and 2, merge to form a company called firm A. After the merger, firm A becomes the Stackelberg leader (first mover), with the remaining competitor, firm 3, being the follower. Compute the price, each firm's output, and profits of each firm in the Stackelberg equilibrium**. (5 marks)**

   (c) Is this merger profitable? What about firm 3's profits before and after the merger? (**4 marks**)

   (d) Suppose instead that after the merger, firm A and firm 3 engage in Cournot competition. Compute the price, each firm's output, and profits of each firm. Is this merger profitable? (**6 marks**)

(continued)

2. Firms A and B both have a marginal cost of production of 4. The products they make are not perfect substitutes. The demand functions faced by each firm are as follows:

$q_A = 18 - 2p_A + p_B$
$q_B = 16 - 3p_B + p_A$

(a) If the firms engage in Bertrand competition, what are the outputs, prices and profits? **(5 marks)**

(b) What are the collusive outputs, prices and profits? That is, find the outcome that maximizes total profits. **(5 marks)**

(c) Find the optimal defection quantities, prices, and profits for each firm (from the collusive solution in part b)? **(5 marks)**

(d) Is collusion sustainable in an infinitely-repeated version of the game? If so, for what discount factors? **(5 marks)**

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3. Mou Team and Pep Team are two rival teams that have their stadiums placed at the two extremes of an avenue of 1 km in length. Mou Team has its stadium at the extreme A and Pep Team at the extreme B. There are 10,000 people (which you can normalize to 1) living along the avenue, that are uniformly distributed. In addition, 1,000 people (which you can normalize to 0.1) live at the extreme A and 3,000 people (which you can normalize to 0.3) live at the other extreme B. The entire population is so fond of football that on Sundays everybody goes to one of the stadiums. The choice of stadium depends on the ticket prices set by the teams and the distance to each stadium. Transportation costs are such that a person at a distance of x km to stadium A has a transportation cost of x. The marginal cost is zero for both stadiums. Answer the following questions:

(a) Find the indifferent consumer and demand of each stadium. **(5 marks)**

(b) Calculate the prices, the demand and the profits of each stadium in equilibrium. Do the stadiums obtain the same profits? Why? **(10 marks)**

(c) Suppose that the Football League requires the two teams to set the same prices but the teams can freely choose the location of their stadiums. Would the teams change the location of the stadiums (if they could relocate at no cost)? Where would the teams locate their stadiums? Explain your answer. **(5 marks)**

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Section B: Answer FIVE Questions

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4. Answer **5 of the following 6 questions**. In each case, decide whether the statement is
    True, **False**, or **Uncertain**. Explain the reason for your answer (**two sentences or less**).
    Most or all of the credit will be given for the explanation. **(8 MARKS EACH)**

    (a) Suppose Apple guarantees early purchasers of the iPhone 6S money back if the
         price later falls (for example, if the price falls from £500 to £450, the early
         purchasers will get a refund of £50). This is a policy that is beneficial to consumers.

    (b) A computer manufacturer consists of an upstream division which makes chips and a
         downstream division which assembles computers. Suppose the market price for
         chips is £10. The optimal transfer price for chips is less than £10.

    (c) In the Cournot Model with entry, too few firms enter (relative to the efficient
         number).

    (d) Suppose a 2004 Toyota Camry is worth £6,000 on January 1, 2016 and a 2002
         Toyota Camry is worth £4,000 on January 1, 2016. For the purposes of the
         question, assume the design of the Camry did not change between 2002 and 2004.
         Assuming a 5% interest rate, a good estimate of the user cost of capital of the 2004
         Camry for one year is £2,300.

    (e) Suppose, in 2015, the UK supermarket industry consists of 3 firms with the
         following market shares: Tesco (60%), Sainsbury (20%), and Waitrose (20%). In
         2016, the market shares change as follows: Tesco (50%), Sainsbury (40%), and
         Waitrose (10%). According to the Herfindahl index, the market concentration rose
         between 2015 and 2016.

    (f)   In the product-positioning model, the "direct effect" reduces product differentiation.