NATIONAL UNIVERSITY OF SINGAPORE

EC3322: Industrial Organization I

Semester 2, AY 2013/14

Time Allowed: 2 hours

MATRICULATION/REGISTRATION NUMBER: _____

TUTORIAL GROUP OR DAY AND TIME: _____

INSTRUCTIONS TO STUDENTS

1. Write your matriculation/registration number only. **Do not write your name.**
2. This exam contains **SEVEN (7)** questions and comprises **FOURTEEN (14)** printed pages.
3. Answer **ALL** questions.
4. Write your answers in the answer boxes provided for each question.
5. This is a **CLOSED** BOOK examination.
6. Calculators are **NOT** allowed.
7. The total marks for this exam is **100**.

Questions 1 and 2 are multiple-choice questions. Circle your answer to each question in the answer box below.

1. (7 marks) Suppose that inframarginal consumers value increases in quality more than the marginal consumer does. How much quality does the monopolist provide compared to a social planner?

   (a) a monopolist provides more quality than a social planner does

   (b) a monopolist provides less quality than a social planner does

   (c) it depends on whether the monopolist sets price or quantity

2. (8 marks) The relationship between a fast-food franchise such as McDonalds and its franchisees can best be described by

   (a) price discrimination

   (b) tying

   (c) horizontal differentiation

   (d) vertical differentiation

   (e) economies of scope

Questions 3 and 4 are short-answer questions. In the answer box below provide your answer and a *brief* explanation. Your answers should be related to the topics we discussed in class.

3. (10 marks) Often manufacturers void a product's warranty if the product is bought in countries in which it was not intended for sale. Why might they do this?

4. (10 marks) I went to a used car dealership last weekend to buy a car and the first question the salesman asks was how much I was willing to pay. Why would he ask this?

5. (15 marks total) The demand curve for a good is $P = 90 - Q$. The marginal cost is $MC(Q) = Q$ for $Q \leq 40$ and infinite for $Q > 40$. That is, the maximum quantity that can be supplied to this market is $Q = 40$.

   (a) (5 marks) What is the monopoly price and quantity?

   (b) (5 marks) What is the deadweight loss associated with the solution in (a)?

   (c) (5 marks) Draw a graph of your answer indicating the monopoly price and output and the deadweight loss, if any.

6. (15 marks total) N consumers are uniformly located on the line $[0, 1]$. Firm 1 is located at 0. Firm 2 plans to enter the market. The market price is regulated and thus fixed at p (assume that p is low enough so that every consumer buys the product). Marginal cost is 0.

   In period 1, firm 2 decides where to locate by choosing a location k. Choosing a location away from firm 1 is costly for firm 2: for each unit of differentiation firm 2 incurs a cost of 2 (so locating at k costs $2k$). In period 2, consumers decide whether to buy from firm 1 or firm 2. If a consumer buys from a firm at a distance d from their location, the consumer's total cost of the product is $p + d^2$.

   (a) (10 marks) Suppose firm 2 locates at k. What is each firm's demand? What are profits?

   (b) (5 marks) Where does firm 2 locate? Explain.

7. (35 marks total) Consider a market with two firms selling a homogeneous product with market demand $P = 16 - Q$. By investing in a technology a firm lowers its marginal cost to 1. Otherwise marginal cost is 4. The fixed cost of the investment is F. Firm 1 makes its investment decision first. Firm 2 observes firm 1's investment decision, then decides whether to invest. Finally, in the third period, the firms chose quantities simultaneously in a Cournot game.

   Find the Subgame Perfect Nash Equilibrium investment decisions and quantities. Hint: the firms' choices will depend on the value of F.