EC3322
Industrial Organization I
Semester 1, 2012-2013
Midterm
October 4, 2012

MATRICULATION/REGISTRATION NUMBER: _____

TUTORIAL GROUP: _____

Instructions

1. Do NOT start reading the questions until you are told to do so.
2. Write your matriculation number and your tutorial group number (or time and day) in the space provided above RIGHT NOW. Do not write your name on the exam.
3. This exam will last 75 minutes.
4. There are a total of 12 pages, including this front page.
5. This exam consists of SIX (6) questions. Answer ALL SIX questions. You must include your work in order to receive full marks.
6. Write your answers in the answer boxes provided for each question.
7. Include all work and derivations that you wish to be graded in the space provided after each question.
8. You MAY NOT use calculators. If you have a calculator on your desk, you will receive a 10 mark penalty.

Questions 1 and 2 are True-False questions. In the answer boxes below, circle your answer to each question and provide a *brief* explanation for full credit.

1. (5 points) Consider an industry that consists of a large number of identical firms. In the long run competitive equilibrium, a firm's marginal cost must equal its average cost.
2. (5 points) Third-degree price discrimination can lower a monopolist's profits compared to uniform pricing.

1. True or False (circle one) Explanation:
2. True or False (circle one) Explanation:

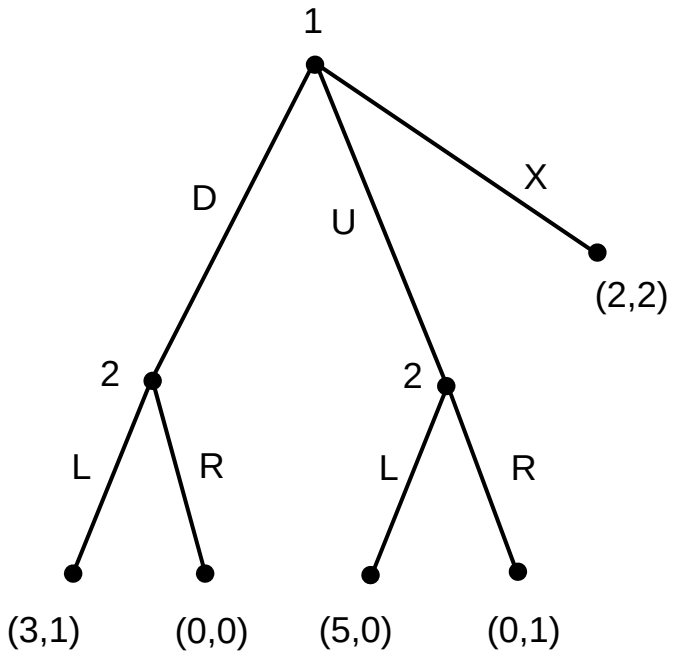
3. (20 points total) The inverse demand curve for bottled water is

$$P = 30 - Q,$$

where Q is total market output and P is market price. Two firms have complete control of the supply of bottled water and both have zero costs. Find the Cournot-Nash equilibrium, price, and firm profits.

3. Write your answers in this box.
Cournot-Nash equilibrium:
p* = π^* =

4. (20 points total) Consider the following game in extensive form.



(a) (10 points) Find the normal form representation of this game.

(b) (10 points) Find all pure strategy Nash equilibrium or equilibria (there could be one or more).

4. Write your answers in this box.

(a) normal form:

(b) Nash equilibrium (or equilibria):

5. (25 points total) Suppose a government-protected monopoly enjoys sole access to a market for a homogeneous product with demand given by

$$Q = 100 - P$$

and with marginal cost $MC = 20$. The reason that the monopoly can continue to be a monopoly is because its public relations firm has generated (false) studies that persuade the government that competition increases costs. In exchange for their studies, the monopolist pays \$20 per unit of output to the public relations firm.

(a) (5 points) Calculate the prices and quantities under monopoly and competition.

(b) (5 points) Calculate total surplus under monopoly and competition. Find the difference in the surpluses. The difference is the social cost of monopoly.

(c) See page 9.

There is space for your work on the next page.

5. Write your answers to (a) and (b) in this box.

(a) monopoly: $P_M^* =$ $Q_M^* =$

perfect competition: $P_{PC}^* =$ $Q_{PC}^* =$

(b) monopoly: $TS_M =$

perfect competition: $TS_{PC} =$

Social cost =

(c) (15 points) The social cost of this monopoly can be separated into two types of cost: the cost of rent seeking (that is, the cost of maintaining its monopoly) and the usual deadweight loss due to output restriction. Carefully draw and label a graph of the perfectly competitive outcome, the monopoly outcome, and the two types of social costs. Also, calculate each type of social cost.

5. (c) Draw your graph in this box.

Social cost due to rent seeking =

Social cost due to restricting output =

6. (25 points total) Suppose a firm, which we will refer to as the "supplying firm," supplies two offices with a photocopying machine. The demand of each office is known to the supplying firm. Office 1 has weekly demand of $Q = 10 - P$, where Q is the number of copies and P is the price per copy. Office 2 has weekly demand $Q = 20 - P$. Assume for simplicity that the cost of paper for the photocopy machine is zero and the cost of supplying the machine is zero.

   Suppose that the supplying firm charges a weekly rental price, R, for the machine along with a per copy price, P.

   (a) (5 points) What is the weekly rental price and the per copy price charged to office 1?

   (b) (5 points) What is the weekly rental price and the per copy price charged to office 2?

   (c) (15 points) Now suppose that there is one type of each office but the supplying firm does not know which office is which. The supplying firm would like to use block pricing in order to second-degree price discriminate. Derive the optimal packages $\{R, Q\}$, where Q is the total number of photocopies the office can make for the fee R. Interpret your results. Be careful!

There is space for your work on the next page.

6. Write your answers in this box.			
(a) R_1^* =	P_1^* =	(b) R_2^* =	P_2^* =
(c) R_1^* =	Q_1^* =	R_2^* =	Q_2^* =
Interpretation:			