CARLETON UNIVERSITY
Department of Economics

ECON 4301 A
Market Structure and Firm Behaviour

2012 Fall

MIDTERM EXAMINATION

The exam is out of 50 marks, with each question being worth 10 marks. You will have 75 minutes to complete the exam so plan your time accordingly. It is strongly recommended that you carefully read through the exam and for each question **think** about what is being asked before you write! If you use a diagram, make sure that you provide adequate documentation.

Write short answers to all **FIVE** questions.

1. Assume that the manufacturing of cellular phones is a perfectly competitive industry. The market demand for cellular phones is $Q^d = (6000 – 50P) / 9$. There are 50 manufacturers of cellular phones and they have the same production costs:

   $TC(q) = q^2 + 10q + 100$ $\quad$ $MC(q) = 2q + 10.$

   a) Show that a firm maximizes profit by producing $q = (P – 10)/2$.
   b) Derive industry supply.
   c) Find the market price and aggregate quantity?
   d) What are the profits of each firm? Will new firms enter? Why?

2. A multiproduct firm's cost function is:

   $$C(Q_1,Q_2) = 75 – 0.25\, Q_1Q_2 + 0.1\, Q_1^2 + 0.2\, Q_2^2$$

   a) Define economies of scope.
   b) Are there economies of scope in producing 10 units of product 1 and 10 units of product 2?

3. A monopolist faces the following demand and cost functions:

   $P(Q) = 250 – Q$ $\quad$ $TC(Q) = (3/2)Q^2$

   a) Calculate the profit maximizing price and quantity?
   b) Define consumer surplus. How much is consumer surplus?
   c) Define producer surplus. How much is producer surplus? [*Drawing a diagram may help*]
   d) Explain what happens to the "missing surplus" under monopoly.

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4. Jeff Davidson owns an amusement park called Curlers' Paradise. "The most curling fun you can have under one roof," is his motto. Since he is well trained in economics, he was able to estimate the following demand and cost functions:

$$P(Q) = 10 - (1/4)Q \qquad TC(Q) = 4Q$$

What is the optimal two-part tariff when there is only one type of individual?

5. Consider the following payoff matrix:

		Player 2 C1	Player 2 C2	Player 2 C3
Player 1	R1	6,4	4,2	2,a
	R2	4,4	b,8	0,4
	R3	c,d	6,4	e,8

a) For what values of *b* does R1 strictly dominate R2?
b) Given that (a) holds, what values of *d* does C1 strictly dominate C2?
c) Define a Nash equilibrium.
d) Given that (a) and (b) hold, find the conditions on *a* and *c* such that (R1,C1) is a Nash equilibrium.

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