Economics 203
Intermediate microeconomics
Instructor: Paul Schure

Practice MT3 (50 marks: 1 minute per mark)

Question 1 Short-answer questions (10 marks).

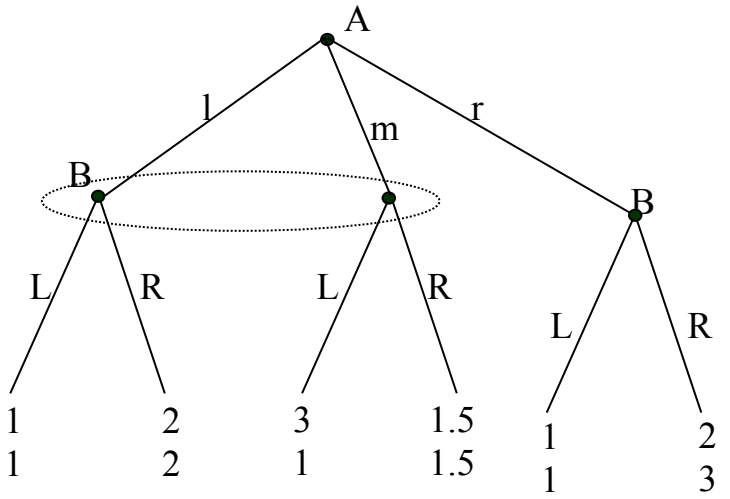
(a) (1) Give two real-world examples of second-degree price discrimination, and (2) two real-world examples of third-degree price discrimination.
   (1) discount vouchers; buy two get the third for free; utility bill with a fixed charge and variable charge; early-bird discounts; etc, etc.
   (2) charging different prices in different countries; student discounts; UVic tuition for Canadians (low) and international students (high); etc, etc

(b) Price discrimination is not always possible. List three conditions needed to enable sellers to price discriminate.
   (1) seller needs to have market power
   (2) It must be permitted by law
   (3) Arbitrage must be impossible or at least costly
   (4) for effective price discrimination the seller must know the relevant demand function(s), at least locally

Notes: (i) Short-answer questions can also be True/False/Uncertain type questions. (ii) the weight on the S-A questions could be varying from say 20% (like in this practive MT) to up to say 40%.

Question 2 (10 marks)

Consider the extensive form representation of a game between two politicians, A and B. Politician A moves first and chooses her political position: left (l), middle (m), or right (r). Next politician B decides: left (L) or right (R). The top entry of each payoff vector represents A's payoff, the bottom entry B's payoff



(a) Consider the following who statements. Tell me whether they are TRUE, FALSE or UNCERTAIN and clarify why in a single sentence.
   1. This is a game of imperfect information --> TRUE, B cannot distinguish whether A has chosen "l" or "m"
   2. This is a simultaneous-move game --> FALSE, this is a dynamic game. A chooses before B chooses.

(b) Give the strategic form representation of the game above. Clarify your notation for the strategies of A and B with an example.

	B				
A	Strategies	LL	LR	RL	RR
	l	(1,1)	(1,1)	(2,2)	(2,2)
	m	(3,1)	(3,1)	(1.5,1.5)	(1.5,1.5)
	r	(1,1)	(2,3)	(1,1)	(2,3)

A's strategies are obvious. As for B's strategies, for example, LR means: "I move L if you moved either l or m and R if you moved r.

Question 3 (10 marks)

In this question consider the UVic Bookstore, i.e. a monopolist for UVic sweaters with cost function $C(Q) = 0.5Q^2 + 550.$ Here *Q* represents the numbers of sweaters produced and sold.

(a) (1) Formulate this *monopolist's problem* in case demand were given by $Q = 90 - P.$ (2) Compute the monopoly price and quantity.

(1) $\max_Q \{(90-Q)Q - 0.5Q^2 - 550\}$ (2) FOC 90-2Q-Q=0 Hence it follows that Q*=30 and P*=60.

(b) Show the solution to the monopolist's problem in a graph and indicate the consumer surplus, the producer surplus, and, if any, the deadweight loss. Answer: Notice that MR(Q)=90-2Q; MC(Q)=Q, so upward sloping. MR=MC at Q=30. The welfare maximizing quantity is given by P=MC, so Q=45. Indeed MC(45)=45. Graph will now work.

Question 4 (10 marks)

A monopolist sells in Canada and the US. Canadian demand is given by $Q_A = 45 - P_A$ and US demand by $Q_B = 80 - 2P_B$. Production costs are $C(Q) = 0.5Q^2$ and assume there are no transportation or border handling costs for the monopolist.

(a) Compute what are the quantities this monopolist will produce for the Canadian and the US market.

A: The problem is: $\max_{Q_A,Q_B} \{(45-Q_A)Q_A + (40-0.5Q_B)Q_B - 0.5(Q_A+Q_B)^2\}$. The two FOCs are $45 - 2Q_A - (Q_A + Q_B) = 0$ and $40 - Q_B - (Q_A + Q_B) = 0.$ Solve

these FOCs to get $Q_A = 10$ and $Q_B = 15.$ That is, sell 15 units in Canada and 10 in the US.

(b) Define what would be meant by *arbitrage* in this context. What assumptions need to made about the cost of arbitrage in question 4a?
A: In this context, arbitrage would be buying in the US and selling in Canada or the other way around. With $Q_A = 10$ and $Q_B = 15,$ we get $P_A = 35$ and $P_B = 32.50.$ So the cost of arbitrage must exceed $2.50 to enable the solution computed in (a)

Question 5 (5+3+2=10 marks)

A monopolist faces two types of customers. Demand of Type A customers is given by $Q_A = 50 - P_A$ and demand of Type B customers by $Q_B = 80 - 2P_B$. There are equally many of each type of consumer. Assume the monopolist's cost function is given by $C(Q) = 20Q.$

(a) Find the optimal two-part tariff $T(Q) = F + vQ$ that this monopolist could charge for its products.

The marginal cost is 20 here, so v*=20. If v were 20 and F zero, then the CS for A *would* be 0.5*30*(50-20)=450 and that of B would be 0.5*40*(40-20)=400. [use quick graphs if that's helpful!] This shows that the optimal F is F*=400.

(b) For the optimal two part tariff you found in (a), what are (1) the deadweight loss, and (2) the consumer surplus of each consumer.

DW loss =0. There is no deadweight loss (as both consumers buy the efficient quantities b/c the variable fee is set equal to the marginal cost). CS of A is 450-400=50. That of B is 400-400=0.

(c) Give an optimal pricing strategy for this monopolist if perfect price discrimination (= first-degree price discrimination) were possible.

Two part tariffs can do the job here as well. But use two different fixed fees, so charge A the tariff of $T_A(Q) = 450 + 20Q,$ and B $T_B(Q) = 400 + 20Q.$ [By the way, notice that this requires you are somehow able to identify who is A and who is B. This was not needed in (a) above. Also, arbitrage should not be possible, or too expensive, but this is also true in (a).]

This practice MT covered monopoly and game theory pretty well. But it didn't contain a question on oligopoly, while the MT3 of course may have such a question. PS3 had a few good examples.