國立中山大學100學年度碩士班招生考試試題

科目：個體經濟學【經濟所碩士班】

1. Consumer 1 has expenditure function $e_1(p_1, p_2, u_1) = u_1\sqrt{p_1 p_2}$ and consumer 2 has utility function $u_2(x_1, x_2) = x_1^3 x_2^a$. Consumer 1 has income m_1, and consumer 2 has income m_2.(10%)
   a. What are the Marshallian demand functions for each of the goods by each of the consumers? (5%)
   b. For what value of the parameter a will there exist an aggregate demand function that is independent of the distribution of income? (5%)

2. Two firms are involved in duopoly. The demand function is $p = a - q$. The cost function for each firm is $c_i(q_i) = c \cdot q_i, \forall i = 1,2$. Find out the Stackelberg equilibrium with firm 1 as the leader in quantity-setting.(10%)

3. Consider a firm with the production function $y = x_1^a x_2^b$, in which y is output, x_i is input for i =1, 2 and $a, b > 0, a + b < 1$. Denote the output price as p, and the input prices as w_1 and w_2, all of which are determined by the competitive market. Find out the factor demand function for x_1. (10%)

4. What are the first and the second degree price discriminations? Do they both meet the criterion of Pareto efficiency? Why? (10%)

5. Mr. Chen has von Neumann and Morgenstern utility function $u(y) = \sqrt{y}$, in which y is income. A lottery with 60 percent probability winning NT$100 and 40 percent probability winning NT$25 is for sale at the price of NT$70 in the market. Will Mr. Chen buy this lottery? What is the highest price that he will be willing to buy it? (10%)

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6. (15 pts) There are two firms. Firm 1 produce good x in a perfectly competitive market and the price is p. With the production x at a cost $c(x)$, it also imposes a cost $e(x)$ on firm 2. This means that for every unit x produced, a unit of "pollution" is produced with it. Let the profits functions of firm 1 and firm 2 be $px-c(x)$ and $-e(x)$, respectively. This is what we call the problem of **externality**. Consider the following solutions:

   (a) (5 pts) If internalizing the externality is possible, please compare the output level before and after the internalization.

   (b) (5 pts) Please identify the rate of Pigovian tax.

   (c) (5 pts) Now, assume that the pollution can be sold and bought at a unit price r, please show that when the demand and supply of the pollution are equal, the pollution level is the same as the one in case *(a)*. Is r positive or negative? Explain.

7. (20 pts) Please find all Nash equilibria, both pure and mixed, in the following game. Player 1 can play B or S. Player 2 can play B, S or X.

		Player 2		
		B	S	X
Player 1	B	4,2	0,0	0,1
	S	0,0	2,4	1,3

8. (15 pts) The ECFA was signed last summer and the early-harvested items were traded according to the new terms starting from Jan. 1, 2011. Many economists are worried about that the wages in Taiwan will converge to the wage level in mainland China. This is called Factor-Price Equalization which is predicted by the Heckscher-Ohlin model. Please explain why the model has such a prediction. Moreover, please present two reasons that cause this prediction to be inaccurate.