國立臺北大學107學度碩士班一般入學考試試題

系（所）組別：經濟學系

科　　目：個體經濟學

☐可 ☑不可使用計算機

一、（50%）

1. (5%) Consider a profit-maximizing monopolist faces the inverse demand function $P(y)=\alpha-\beta y$ with $\alpha,\beta>0$, and has the total cost function $C(y)=cy$ with $0<c<\alpha$, where y is the output amount. Suppose the government imposes a quantity tax of \$4 per unit of output on this monopolist. Then, the equilibrium price will increase __(1a)__ and the equilibrium quantity will decrease __(1b)__.

2. (5%) Under the set-up of question 1 but with the monopolist operating at an output level with point price elasticity of demand equal to 3. If the government imposes a quantity tax of \$4 per unit of output, then the price will increase __(2)__.

3. (5%) Suppose that a representative firm in a perfectly competitive industry has the production function $f(x_1,x_2)=\min\{x_1,x_2\}^{\alpha}$ with $0<\alpha<1$, where x_1 and x_2 are the amounts of inputs 1 and 2, respectively. Denote w_1 and w_2 the prices of inputs 1 and 2, respectively. Suppose that this firm chooses the amounts of inputs 1 and 2 to minimize its costs for producing y units of output. The long run cost function of this firm is __(3a)__ and the long-run supply function of this firm is __(3b)__.

4. (5%) Consider a representative firm in a perfectly competitive market using three inputs to produce its output: labor (L), capital (K), and material (M). The production function is given by $f(L,K,M)=L^{\frac{1}{3}}K^{\frac{1}{3}}M^{\frac{1}{3}}$. Suppose the unit price of labor, capital, and material are $w=1$, $r=1$, and $m=1$, respectively. Each firm is assumed to solve the cost minimization problem given the capital level $K=1$. The short-run cost function of each firm is __(4a)__ with efficient scale__(4b)__.

5. (5%) As in question 4, the short-run supply function of each firm is __(5a)__ and the market supply function is __(5b)__ if there are 100 identical firms in this industry.

6. (5%) Consider the following two-player game. Player 1 can choose *T*, *M*, or *B*, while player 2 can choose *L*, *C*, or *R*. The payoffs under players' various action profiles are given below.

		Player 2		
		L	C	R
Player 1	T	-1, 3	3, -1	5, 0
	M	3, -1	-1, 3	5, 0
	B	0, 5	0, 5	1000, 4

All the Nash equilibria including the mixed-strategy ones are __(6)__.

7. (5%) There is an industry with three firms, each having zero marginal cost and zero fixed cost. The inverse demand function faced by these three firms is $P(q_1,q_2,q_3)=60-(q_1+q_2+q_3)$. Suppose that these three are Cournot competitors. Then, the Cournot-Nash equilibrium is __(7a)__ with equilibrium profits of three firms __(7b)__.

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8. (5%) Consider the three firms and inverse demand function as assumed in question 7. But now suppose that firm 1 can commit to a certain level of output in advance. Afterwards, firms 2 and 3 will choose their outputs to maximize their profits independently and simultaneously. The subgame perfect Nash equilibrium is ____(8a)____ with equilibrium profits of three firms ____(8b)____.

9. (5%) Mary and Danny are risk averse and von Neumann-Morgenstern expected utility maximizers with utility function $U(w)=w^{\frac{1}{2}}$ at all wealth level $w>0$. Suppose that Mary's wealth is \$10,000 and she may face a 40% chance of losing \$7,500. Danny' wealth is \$1,000,000 and he also faces a 40% chance of losing \$7,500. The certainty equivalent of wealth for Mary, which is the wealth level with certainty providing Mary the same expected utility as the risky bundle, is ____(9a)____. The certainty equivalent of wealth for Danny is ____(9b)____.

10. (5%) Assume that Mary and Danny have the utility function and wealth levels as specified in question 9, and Mary will face the same risky bundle stated in question 9 as well. However, Danny now faces no risk at all. Suppose that Mary offers to pay Danny $R>0$ to bear her risk of losing \$7,500. Mary will pay Danny R whether or not she suffers the loss. If Mary loses \$7,500, Danny must pay her \$7,500. Under the circumstance, the lower bound of R is ____(10a)____ and the upper bound of R is ____(10b)____ so that Mary and Danny will agree this arrangement.

二、（50%）

1. （16%）甲有 6 間房子(X)和 2 筆土地(Y)，乙有現金 10000 萬元，房子市價為 1000 萬，土地市價為 1000 萬，甲和乙的效用函數皆為 $U(X,Y)=X^{\frac{1}{2}}Y^{\frac{1}{2}}$，求
   (1)甲和乙二人對房子的最適消費量與效用水準分別為多少？
   (2)若房子市價下跌為500萬，甲的效用會提高或降低？乙的效用會提高或降低？
   (3)對乙而言，房子市價下跌為500萬時，Hicks定義的X財所得效果和替代效果各為多少？

2. （16%）假設消費者對 X 與 Y 財的效用函數為 $U(X,Y)=Y+12X-X^2/2$，X、Y 財的價格分別為 P_X=2、P_Y=1，預算為 M=30，
   (1)求消費者均衡為何？
   (2)求X財之普通需求函數X(P_X, P_Y, M)。
   (3)求X財之Hicks受補償需求函數。
   (4)求 P_X 由2元降至1元時Slutsky定義的X財替代效果與所得效果。
   (5)若所得M為30元，P_Y=1，求 P_X 由2元降至1元時之補償變量、對等變量以及消費者剩餘的變動為多少？

3. （18%）某甲兩期消費的效用函數為 $U(C_1,C_2)=C_1C_2$，兩期商品價格均為 1 (即 $P_1=P_2=1$)，兩期所得原賦為 $(Y_1,Y_2)=(700,816)$，名目利率為 2%，
   (1)請計算兩期的最適消費組合為多少？某甲於最適選擇點為貸出者還是賒借者？效用為多少？
   (2)假設名目利率自2%上升至36%，請計算新的最適消費選擇點。某甲於新的最適選擇點為貸出者還是賒借者？某甲效用會增加還是減少？
   (3)若兩期所得原賦為$(Y_1,Y_2)=(800,714)$，名目利率自2%上升至36%時，請問某甲第一期消費會增加還是減少？某甲於新的最適選擇點為貸出者還是賒借者？某甲效用會增加還是減少？

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