

# 東吳大學 102 學年度碩士班研究生招生考試試題

第 1 頁，共 2 頁

系級	經濟學系碩士班	考試時間	100 分鐘
科目	個體經濟學	本科總分	100 分

所有非整數答案請表示為小數，並取近似值至小數點後一位。

**Please write all answers in decimals, NOT fractions. And round decimals to the nearest tenth.**

1. A consumer can spend her fixed income of \$60 on two products: food (F) and luxuries (L). The consumer's preferences are represented by the utility function as follows:

$$U = F^{1/2} L^{1/2}.$$

Food sells for \$2 per unit and luxuries sell for \$5 per unit.

- (a) [5 marks] Draw the budget constraint for this consumer.
- (b) [5 marks] Compute the amounts of each good in the consumer's optimal consumption bundle.
- (c) [5 marks] Assume that the government imposes a tax of \$1 to the price of luxury goods. How does it affect the consumption of the individual?
- (d) [10 marks] Under the same conditions as in part (c), compute both the Hicksian substitution effect and Slutsky substitution effect on the luxury goods.

2. Two firms A and B both sell a homogenous product. Denote by  $P$  the price of this product and  $Q$  the aggregate output. The market demand for this product is

$$Q = 100 - P.$$

Both firms have constant unit costs equal to 10. The firms compete in quantities.

- (a) [10 marks] At the Cournot equilibrium, how much does each firm produce and what is the corresponding market price?
- (b) [10 marks] If firm A moves first (i.e. it is a Stackelberg leader), what is the resulting equilibrium? Please compute the output and profits of each firm as well as the market price.
- (c) [5 marks] Suppose the two firms agreed to collude and split monopoly profits equally. Calculate the collusive industry output and price.

3. Consider the following exchange economy with two goods, X and Y and two consumers, A and B. The preferences of the two consumers are represented by the following utility functions:

$$U_A = \log(X_A) + \log(Y_A)$$

$$U_B = X_B + Y_B$$

There are 20 units of good X and 10 units of good Y available in this exchange economy, so that

$$X_A + X_B = 20 \text{ and } Y_A + Y_B = 10.$$

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第 2 頁，共 2 頁

系 級	經濟學系碩士班	考試 時間	100 分鐘
科 目	個體經濟學	本科 總分	100 分

- (a) [10 marks] Draw the contract curve for this economy in the Edgeworth box. What is the equation of this contract curve?
- (b) [5 marks] Suppose that the initial allocation for this economy gives 4 units of good X and 1 unit of good Y to A, and the rest to B. What is the core of this exchange economy?
- (c) [10 marks] Under the same conditions as in part (b), compute the competitive equilibrium of this economy. (You need to determine the relative price of the two goods as well as the quantities of each good consumed by each individual.)
4. Mary has a total wealth of \$4. She may invest the \$4 and receive \$9 if there are good times, but receive only \$1 if there are bad times. Mary estimates that good times happen with a probability 0.5 and bad times with a probability 0.5. Before Mary decides whether or not to invest, she has the opportunity to buy a report that tells her with certainty whether good times or bad times will occur. Mary's utility function is  $U(I)$ , where  $I$  is her income expressed in dollars (\$).
- (a) [5 marks] Assume that Mary is risk-neutral, with  $U(I) = I$ . How much would she be willing to pay for the report?
- (b) [10 marks] Assume that Mary is risk-averse, with  $U(I) = I^{1/2}$ . How much would she be willing to pay for the report?
- (c) [10 marks] Suppose that publisher of the report estimates that there are 25% risk-neutral investors like Mary in part (a) and 75% risk-averse investors like Mary in part (b). If the cost of producing the report is zero, what is the profit maximizing price for the report?

**End of Paper**