

# 國立中山大學 112 學年度

## 碩士班暨碩士在職專班招生考試試題

科目名稱：個體經濟學【經濟所碩士班】

### — 作答注意事項 —

考試時間：100 分鐘

- 考試開始鈴響前不得翻閱試題，並不得書寫、劃記、作答。請先檢查答案卷（卡）之應考證號碼、桌角號碼、應試科目是否正確，如有不同立即請監試人員處理。
- 答案卷限用藍、黑色筆(含鉛筆)書寫、繪圖或標示，可攜帶橡皮擦、無色透明無文字墊板、尺規、修正液（帶）、手錶(未附計算器者)。每人每節限使用一份答案卷，請衡酌作答(不得另攜帶紙張，亦不得使用應考證空白處作為計算紙使用)。
- 答案卡請以 2B 鉛筆劃記，不可使用修正液（帶）塗改，未使用 2B 鉛筆、劃記太輕或污損致光學閱讀機無法辨識答案者，後果由考生自負。
- 答案卷（卡）應保持清潔完整，不得折疊、破壞或塗改應考證號碼及條碼，亦不得書寫考生姓名、應考證號碼或與答案無關之任何文字或符號。
- 可否使用計算機請依試題資訊內標註為準，如「可以」使用，廠牌、功能不拘，唯不得攜帶具有通訊、記憶或收發等功能或其他有礙試場安寧、考試公平之各類器材、物品（如鬧鈴、行動電話、電子字典等）入場。
- 試題及答案卷（卡）請務必繳回，未繳回者該科成績以零分計算。
- 試題採雙面列印，考生應注意試題頁數確實作答。
- 違規者依本校招生考試試場規則及違規處理辦法處理。

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科目名稱：個體經濟學【經濟所碩士班】

題號：403002

※本科目依簡章規定「不可以」使用計算機(混合題)

共 3 頁第 1 頁

Questions 1 and 2 are multiple-choice questions. One point will be deducted for each wrong choice. If the score of the question is below zero or none of the choices are selected, the question will be scored as zero.

## Question 1 (5 points) Multiple-Choice Question

Consider a game of two players. Player 1 has two strategies, T and D, and player 2 has two strategies, L and R. The payoff matrix is in Figure 1.

	L	R
T	a, b	c, d
D	e, f	g, h

Figure 1

Which of the followings is correct? (There may be more than one correct answer.)

- (A) If  $c > a$ , the strategy profile (T, L) cannot be a Nash equilibrium.
- (B) If  $d > b$ , the strategy profile (T, L) cannot be a Nash equilibrium.
- (C) If  $g > a$  and  $h > b$ , the strategy profile (T, L) cannot be a Nash equilibrium.
- (D) Consider the strategy profile (T, L). If the payoffs are such that player 1 wants to deviate from playing T, and player 2 wants to deviate from playing L, then the strategy profile (D, R) must be a Nash equilibrium.
- (E) If  $c = e = g$  and  $d = f = h$ , then the strategy profile (D, R) is a Nash equilibrium.

## Question 2 (5 points) Multiple-Choice Question

In a second-hand car market, there are 100 high-quality cars and 100 low-quality cars that may be sold. There are 200 potential buyers, and each potential buyer will buy at most one car. Each seller values a high-quality car at 3000 dollars and a low-quality car at 1000 dollars. Each buyer values a high-quality car at 3500 dollars and a low-quality car at 1500 dollars. Sellers know the quality of the cars that they sell and have options of not selling their cars. Buyers cannot observe the quality of a car on the market. However, buyers know correctly the ratio of high-quality car and low-quality car that are for sale.

Which of the followings is correct? (There may be more than one correct answer.)

- (A) All the high-quality cars are sold.
- (B) All the low-quality cars are sold.
- (C) The estimated value of a car for sale from a buyer's perspective is 2500 dollars.
- (D) The estimated value of a car for sale from a buyer's perspective is 1500 dollars.
- (E) The price of a car sold on the market is at most 1500 dollars.

## Question 3

Consider a consumer with the budget  $m$ , and there are two goods, good 1 and good 2, that he/she can consume. The consumption of good 1 is  $x_1$ , and the consumption of good 2 is  $x_2$ . The price of good 1 is  $p_1$ , and the price of good 2 is  $p_2$ .

- (A) (10 points) If this consumer's utility function is  $u(x_1, x_2) = x_1 + x_2$ , what are his/her demand functions for each good? (We assume  $p_1 < p_2$  for this question.)
- (B) (10 points) If this consumer's utility function is  $u(x_1, x_2) = \min\{x_1, x_2\}$ , what are his/her demand functions for each good?

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共 3 頁第 2 頁

For the following questions (C) – (F), we assume that this consumer's utility function is  $u(x_1, x_2) = x_1^2 x_2^3$ .

(C) (10 points) Suppose  $p_1 = 2$ ,  $p_2 = 3$ , and  $m = 10$ . What are his/her demand functions for each good?

(D) (10 points) Following question (C), if the price for good 1 is changed to  $p'_1 = 1$ , what is the (Slutsky) substitution effect?

(E) (5 points) Following questions (C) and (D), what is the income effect?

(F) (10 points) Following question (C), suppose the government imposes a quantity tax on good 1, so that consuming  $x_1$  requires paying a tax of  $tx_1$ . Let  $t = 1$ . What is the consumer's optimal consumption bundle?

Question 4 (15 points)

Consider a monopoly firm that produces goods for two separate market, market 1 and market 2. Let the quantity produced for market 1 be  $y_1$  and the quantity produced for market 2 be  $y_2$ . The (inverse) demand function for market 1 is  $p(y_1) = 2 - y_1$ , and the (inverse) demand function for market 2 is  $p(y_2) = 3 - y_2$ . The cost function for production is  $c(y_1, y_2) = (y_1 + y_2)^2$ . For this firm to maximize the profit, what are the optimal productions of  $y_1$  and  $y_2$ .

Question 5

Consider a market where there are an incumbent firm, Firm 1, and a firm that considers entering the market, Firm 2. Both firms produce the identical products.

Denote the amount that Firm 1 produces as  $y_1$ , and denote the amount that Firm 2 produces as  $y_2$ , if Firm 2 enters the market. The cost of production is zero for both firms. The (inverse) demand function of the market is  $p(Y) = 10 - (y_1 + y_2)$ . Firm 2 need to spend a fixed cost  $E = 3$  in order to enter the market.

Firm 2 first decides whether to enter, and Firm 1, after observing Firm 2's decision, chooses whether to fight against Firm 2. If Firm 2 enters, both firms engage in quantity competition in the following way. If Firm 2 enters and Firm 1 does not fight, both firms compete as in the Stackelberg model, where Firm 1 plays the leader and Firm 2 plays the follower. If Firm 2 enters and Firm 1 fights, Firm 1 produces  $y_1 = y'_1 = 7$ , and Firm 2 produces a profit-maximizing amount as a response to Firm 1's production. If Firm 2 does not enter the market, Firm 1 produces the profit-maximizing amount  $y_1 = y^*_1$ . Figure 2 expresses the game tree of above extensive-form game (without specifying the payoffs).

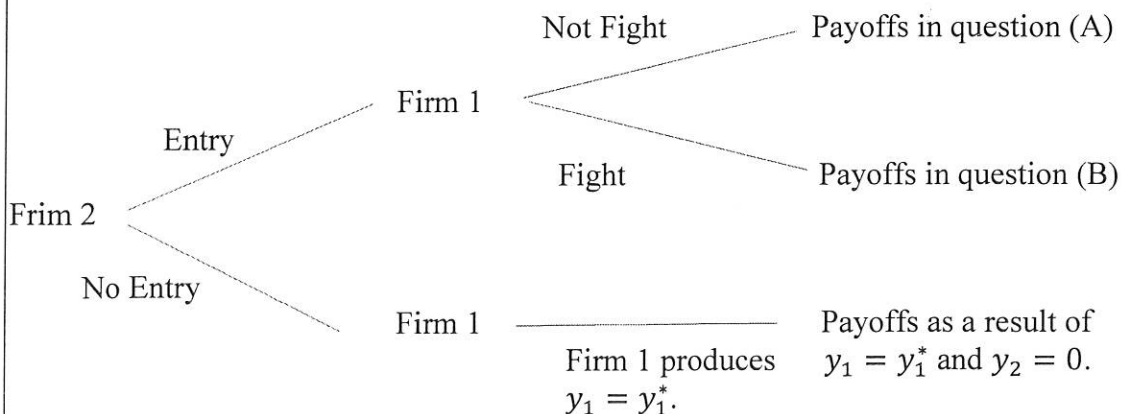


Figure 2

(A) (10 points) Suppose Firm 2 enters and Firm 1 chooses not to fight. Both firm compete as in the Stackelberg model, where Firm 1 is the leader and Firm 2 is the follower. What are the profits for

試題請隨卷繳回，請留意背面是否有題

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共 3 頁 第 3 頁

both firms?

- (B) (5 points) Suppose Firm 2 enters and Firm 1 chooses to fight and produces  $y_1 = y'_1 = 7$ . What are the profits for both firms? (In this question, treat the fixed cost  $E = 3$  as a sunk cost for Firm 2 and find the optimal  $y_2$ , and then calculate the resulting profits for each firm.)
- (C) (5 points) What is the Nash equilibrium of this game?