國立中山大學114學年度
碩士班考試入學招生考試試題

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。
- 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，唯不得攜帶書籍、紙張（應考證不得做計算紙書寫）、具有通訊、記憶、傳輸或收發等功能之相關電子產品或其他有礙試場安寧、考試公平之各類器材入場。
- **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。**

國立中山大學114學年度碩士班考試入學招生考試試題

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(問答申論題)　　

Question 1: There is a consumer with a utility function $u(x,y) = x^{1/3}y^{2/3}$ where x is the consumption on good 1 and y is the consumption on good 2. The price for good 1 is $p_1 = 1$, and the price for good 2 is $p_2 = 2$. The consumer has an income of 10. Suppose the government imposes a tax on the consumption of good 1 so that the consumer needs to pay 0.5 for every unit of consumption for good 1.

(a) What is the optimal consumption of good 1 and good 2 for this consumer? (15 points)
(b) What is the tax collected by the government? (5 points)

Question 2: A person's utility comes from consumption and leisure. He/she has an endowment of 10 units of money. There is an amount of time, which is 24 hours, that he/she can spend on either work or leisure. The wage is 2 units of money per hour, and the price of consumption is 1 unit of money. His/her utility function is $u(C,L) = \sqrt{CL}$, where C is the amount of consumption and L is the amount of leisure. This person needs to decide the amount of time spent between work and leisure in order to maximize his/her utility.

(a) Draw the budget line on a graph where the horizontal axis represents leisure, and the vertical axis represents consumption. (8 points)
(b) What is this person's optimal allocation of time between work and leisure? (10 points) What is his/her utility at this allocation? (2 point)

Question 3: A monopoly firm faces a market that consists of two groups of consumers. The demand function for the first group of consumers is $D_1(p)$, and the demand function for the second group of consumers is $D_2(p)$, where p is the price. If the firm produces Y units of output, then the total cost of production is $5Y$. The firm sets the same price for both groups of consumers.

(a) Suppose $D_1(p) = 40 - p$ and $D_2(p) = 20 - \frac{1}{2}p$. What is the profit-maximizing price? (10 points) What is the quantity sold under this price? (5 points)
(b) Suppose $D_1(p) = 40 - p$ and $D_2(p) = 2 - \frac{1}{2}p$. What is the profit-maximizing price? (10 points) What is the quantity sold under this price? (5 points)

Question 4: Two players play the following extensive-form game. Player 1 first decides to play L_1 or R_1. If he/she plays L_1, the game ends, and if he/she plays R_1, it is player 2's turn. Then, Player 2 decides whether to play L_2 or R_2. If Player 2 plays L_2, the game ends, and if he/she plays R_2, its Player 1's turn. Finally, Player 1 decides whether to play L_3 or R_3. The game tree is shown in Figure 1. In the game tree, the number on the left in a pair of numbers represents Player 1's payoff, and the number on the right in a pair of numbers represents Player 2's payoff.

Use backward induction to find the subgame-perfect Nash equilibrium. (15 points)
Note that you need to provide some brief reasoning on the backward induction to get full credits.

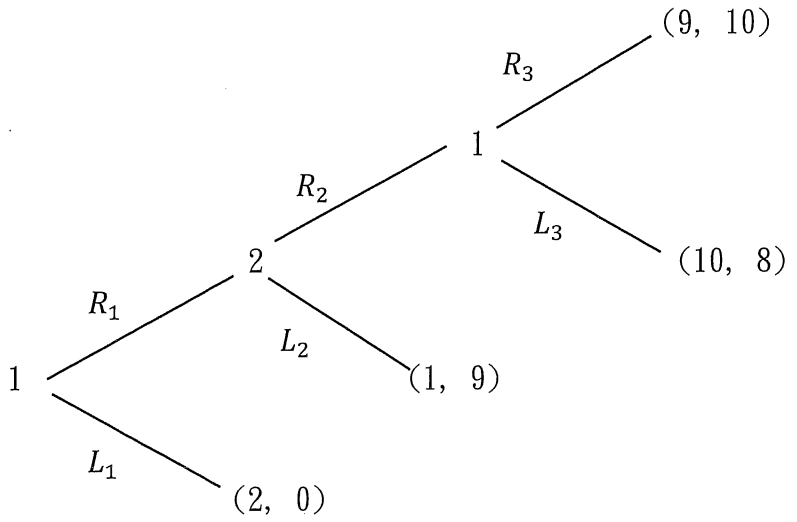

Figure 1: The game tree for Question 4

Question 5: Three players play a simultaneous-move game. Player 1 chooses between *U* and *D*. Player 2 chooses between *L* and *R*. Player 3 chooses between *A* and *B*. Note that all three players make their decisions simultaneously. The payoff matrices are shown in Figure 2. In Figure 2, Player 1 chooses which row to play; Player 2 chooses which column to play; Player 3 chooses which matrix to play. In each cell in the matrices, the number on the left is Player 1's payoff; the number in the middle is Player 2's payoff; the number on the right is Player 3's payoff. (For example, if Player 1 plays U, Player 2 plays L, and Player 3 plays A, then Player 1 gets 3, Player 2 gets 3, and Player 3 gets 10.)

Find all pure-strategy Nash equilibria. You need to provide some brief reasoning on your answer to get the full credits. (15 points)

A

	L	R
U	3, 3, 10	2, 2, 0
D	2, 2, 0	10, 10, 9

B

	L	R
U	2, 5, 9	2, 1, 0
D	1, 2, 0	3, 3, 10

Figure 2: The payoff matrices for Question 5