

# 國立中山大學 106 學年度碩士暨碩士專班招生考試試題

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)

共 2 頁第 1 頁

1. (10pts) The consumer price index (CPI) is known for its upward bias. Please use a graph to explain why a worker would be over-compensated if his/her salary is adjusted by CPI each year? (For instance, the CPI is 5% and the salary is raised by 5% to compensate the worker's loss due to inflation.)
2. (10pts) A Cobb-Douglas production function is stated below:
 
$$q = AL^\alpha K^\beta,$$
 where  $A, \alpha, \beta$  are all positive constants. Please show that this production function exhibits the decrease of marginal productivity on  $L$ . Can this production function exhibit increasing returns to scale? If it can, what condition do we need for that?
3. (10pts) Does profit maximization imply cost minimization? Why or why not? Does cost minimization imply profit maximization? Why or why not?
4. (10pts) OPEC last month decided to cut its oil production by 1.2 million barrels per day starting from 2017. How does this announcement affect the oil production from oil shale in the United States? Can you use a graph to explain the short-run operating decision made by the shale oil producers in the U.S.?
5. (10pts) Consider a small open economy. Suppose the world price of good  $A$  is lower than the domestic equilibrium price under autarky in this economy. Now, the government of this country decides to raise the price of good  $A$  through a tariff to protect the domestic firms that produce good  $A$ . After implementing the tariff, the domestic price of good  $A$  is still lower than the price under autarky. Please use a graph to explain the welfare change on the economy comparing to the social welfare level under free trade. If the government instead uses a quota to achieve the same domestic price level as the one under the tariff, what happen to the welfare level? Please use the same graph to explain.
6. (15pts) A child's action,  $a \geq 0$ , affects both her own private income,  $c(a)$ , and her parents' income,  $p(a)$ , with  $c(a) < p(a)$ . The child is selfish and cares only her income. The parents may transfer some income,  $t$ , to the child. The parents' utility function is  $u_p = \min(p(a) - t, c(a) + t)$ . However, the child is a rotten kid who takes an action firstly. The parents then decide how much to transfer.
  - a) (5pts) Find the equilibrium of this family game;
  - b) (5pts) What happens if  $u_p = \ln(p(a) - t) + \ln(c(a) + t)$ ?
  - c) (5pts) Discuss the implications of the rotten kid's behavior.
7. (10pts) Consider the strategic form game in Figure 1 which shows a form of prisoner's dilemma with  $(D, R)$  being the equilibrium. Find the ranges for  $a$  and  $b$ .

		<i>Player 2</i>	
		<i>L</i>	<i>R</i>
<i>Player 1</i>	<i>U</i>	4, 4	1, 6
	<i>D</i>	5, 2	a, b

Figure 1

背面有題

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8. (5pts) Comment on the argument that Nash equilibrium implies Pareto efficiency.
9. (20pts) Consider the following model of a lake where all members of a community have the right to fish. Assumptions and definitions are given as follows.
- $$q = (\sum_{i=1}^n L_i)^\alpha, \quad q_i = q \cdot \frac{L_i}{\sum_{i=1}^n L_i}, \quad \text{and} \quad \pi_i = p \cdot q_i - w \cdot L_i, \quad 0 < \alpha < 1, i = 1, \dots, n$$
- where  $q$  is the total product of fish,  $L_i$  the labor input of individual  $i$ ,  $q_i$  the product of individual  $i$ ,  $p$  the unit price of fish, and  $w$  the competitive wage rate.
- (5pts) Write down the condition of an individual's optimal decision;
  - (5pts) What is the condition of Pareto efficiency?
  - (5pts) Show that free access leads to overfishing; and
  - (5pts) Design a mechanism which can result in efficiency in the use of public goods, the lake.