

# 國立成功大學

## 115學年度碩士班招生考試試題

編 號：212

系 所：經濟學系

科 目：個體經濟學

日 期：0203

節 次：第 2 節

注 意：1.不可使用計算機  
2.請於答案卷(卡)作答，於  
試題上作答，不予計分。

1. A consumer has utility function  $u(q_1, q_2) = 4q_1 + 5q_2$  and income 600. The initial prices are  $(p_1, p_2) = (1, 1)$ . Now the price of good 1 decreases to 0.5. Find the Hicks substitution effect and income effect. (10%)
2. A consumer has utility function  $u(q_1, q_2) = 8\sqrt{q_1} + 4q_2$  and income  $Y$ . Find the uncompensated demand function for good 1  $q_1(p_1, p_2, Y)$ , where  $p_1, p_2$  are prices of goods 1 and 2, respectively. (10%)
3. A consumer has utility function  $u(q_1, q_2) = 4\sqrt{q_1} + 4q_2$ . The compensated demand function for good 2 is  $h_2(p_1, p_2, u)$ , where  $u$  is the consumer's utility level and  $p_1, p_2$  are prices of goods 1 and 2, respectively. Assume that  $h_2(5, 20, u) > 0$ . Find the range of  $u$ . (10%)
4. A monopoly's Lerner Index is  $\frac{1}{2}$  at its profit-maximizing price  $p^*$  and output  $q^*$ . Assume that the firm's cost function is  $c(q) = q^2 + 16$ . Assume that the demand function  $Q(p)$  has constant demand elasticity and  $Q(1) = 1$ . Find the monopoly's profit-maximizing output  $q^*$ . (10%)
5. Find the elasticity of substitution for production function  $q = L^2K^3$ , where  $L$  and  $K$  are labor and capital inputs, respectively. (10%)
6. Consumers 1 and 2 in a pure exchange economy have the same utility function  $u_i(x_{i1}, x_{i2}) = x_{i1}x_{i2}$ ,  $i = 1, 2$ . Their endowments are  $\omega_1 = (10, 30)$ ,  $\omega_2 = (50, 20)$ . (20%)
  - (1) Find the contract curve. (10%)
  - (2) Find the core. (10%)
7. Let  $X$  be a consumption set and let  $\succeq$  be a preference relation defined on  $X$ . We say  $\succeq$  is continuous if the following condition is satisfied:  
 Suppose that  $x^n, y^n$  are bundles in  $X$  with  $x^n \succeq y^n$  for all  $n = 1, 2, 3, \dots$ . Assume that  $\lim_{n \rightarrow \infty} x^n = x$  and  $\lim_{n \rightarrow \infty} y^n = y$ . Then  $x \succeq y$ .  
 Assume that John's preference relation is convex. Is John's preference relation continuous? Explain your answer. (15%)
8. A consumer spends income  $Y^*$  and obtains the best bundle  $q^* = (q_1^*, q_2^*)$  at price  $p^* = (p_1^*, p_2^*)$ . At bundle  $q^*$ , her utility level is  $u^*$ . Please derive the Slutsky equation  $\varepsilon = \varepsilon^* - \theta\xi$ , where  $\varepsilon$  is the price elasticity of demand at price  $p_1^*$  of her uncompensated demand function  $q_1(p_1, p_2^*, Y^*)$  for good 1,  $\varepsilon^*$  is the price elasticity of demand at price  $p_1^*$  of her compensated demand function  $h_1(p_1, p_2^*, u^*)$  for good 1,  $\theta$  is the share of the budget spent on good 1 and  $\xi$  is the income elasticity of demand for good 1 at  $q^*$  and  $Y^*$ . (15%)