

Final Exam

Date: May 29, 2008

Subject: Advanced Microeconomics I (ECO600E)

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1. True or False (10 points, moderate)

Answer whether each of the following statements is true or false. You DON'T need to explain the reason.

- (a) Suppose a preference relation \succsim on \mathbf{X} is rational. Then, if a set \mathbf{X} is finite, we can always find a utility function $u(\mathbf{x})$ that represents \succsim .
- (b) The absolute value of Slutsky compensation is usually larger, but sometimes strictly smaller than that of compensating variation (CV).

2. Optimization (20 points, easy)

Solve the following maximization problem by using Kuhn-Tucker method. Do Kuhn-Tucker (necessary) conditions lead to a unique solution? If not, how many potential solutions do satisfy the K-T conditions?

$$\begin{aligned} & \max_{x,y} (x-1)^2 + (y-1)^2 \\ & \text{s.t. } x + 2y \leq 1 \\ & x \geq 0, y \geq 0 \end{aligned}$$

3. Consumer Theory (20 points, moderate)

A consumer's utility function is given as

$$u(x, y) = \min(\alpha x, \beta y)$$

where $\alpha, \beta > 0$. Let $p, q > 0$ be the prices for good x and y respectively. Then, answer the following questions.

- (a) Derive the Marshallian demand function.
- (b) Find the indirect utility function.
- (c) Find the (minimum) expenditure function.
- (d) Derive the Hicksian demand function.

4. **General Equilibrium (20 points, challenging)**

Consider an exchange economy. Suppose individuals have the symmetric utility functions and initial endowments which are given as follows.

$$u(x, y) = x^2 + y^2$$
$$(\omega_x, \omega_y) = (1, 1)$$

- (a) Assume there are only two individuals in this economy. Then, draw the Edgworth-box and show the contract curve. Find a general equilibrium (equilibrium price and allocation) if it exists. If there is no equilibrium, explain the reason.
- (b) Suppose there $n(> 2)$ individuals. Then, can we find a general equilibrium? Does the answer depend on n ?