

招生學年度	101	招生類別	碩士班
系所班別	經濟學系碩士班		
科目	個體經濟學		
注意事項	本考科禁止使用掌上型計算機		

1. The demand for a patented AIDS treatment was $P_N = 100 - Q_N$ in North America but $P_S = \alpha 100 - Q_S$ in Sub-Saharan Africa with $\alpha < 1$ since African consumers have smaller income. The marginal cost of producing a unit of treatment is \$20. The transport costs are negligible.

- (1) If the drug manufacturer serves only North America, what are the profits? (5%)
- (2) If the drug manufacturer is to serve both markets while charging the same price in each market, show that α has to be greater than 0.531? (10%)
- (3) If the drug manufacturer is able to price discriminate between the two markets, what prices it should charge in each market? (5%)
- (4) Assume that α is less than 0.531, calculate the social welfare under part (1) and under part (3). (10%)
- (5) Given your answer in part (4), comment on the following statement:
"Third-degree price discrimination reduces total social welfare." (10%)

2. Suppose your cost function is given by:

$$c = 0.04y^3 - 0.9y^2 + (11 - k)y + 5k^2$$

where c is cost, y is output and k is the amount of the fixed input in the short run. Input prices are assumed to be fixed.

- (1) Derive the expressions for the long-run average and marginal costs as functions of output. (5%)
- (2) Demonstrate by algebra that short-run average cost and long-run average cost are tangent to each other only when k is chosen optimally. (5%)

3. Suppose the utility function for goods X and Y is given by

$$U = U(X, Y) = XY + Y$$

- (1) Calculate the uncompensated demand functions for X and Y and describe how the demand curves for X and Y are shifted by (a) changes in income, and (b) changes in the price of the other good. (10%)
- (2) Calculate the expenditure function for X and Y. (5%)
- (3) Use the expenditure function calculated in part (2) to compute the compensated demand functions for X and Y. (5%)

4. Suppose that the uncompensated effect of a one percent rise in the price of coffee beans is to reduce the demand for coffee machine by 15 percent. The following information is provided:

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	coffee beans	coffee machine
α_i	9%	3%
η_y	2	3

- (1) Are coffee beans and coffee machine Hicksian substitutes? Why? (5%)
- (2) How would a rise in coffee machine prices affect the demand for coffee beans?
 (α_i : good i's expenditure share, η_y : income elasticity) (10%)
5. An individual purchases a dozen eggs and must take them home. Although making trips home is costless, there is 50 percent chance that all of the eggs carried on any one trip will be broken during the trip. The individual considers two strategies:
- Strategy 1: Take all 12 eggs in one trip.
- Strategy 2: take two trips with 6 in each trip.
- (1) List the possible outcomes of each strategy and the probabilities of these outcomes. Show that on the average, 6 eggs will remain unbroken after the trip home under either strategy. (5%)
- (2) Develop a graph to show the utility obtainable under each strategy. Which strategy will be preferable? (10%)