國立嘉義大學九十五學年度

運輸與物流工程研究所碩士班招生考試(乙組)試題

科目：經濟學

1. Please compare the differences between Cournot competition and Bertrand competition. (25%)

2. The economists usually use the utility-maximization model to explain individuals' behavior. That is, individuals are assumed to behave as if they maximized utility subject to a budget constraint. The utility-maximization model with two products x_1 and x_2 can be expressed as the following mathematical model:

$$\begin{aligned} \text{Max} \quad & U(x_1, x_2) \\ \text{s.t.} \quad & p_1 x_1 + p_2 x_2 \le B \\ & x_i \ge 0 \end{aligned}$$

where

$U(\cdot)$: consumer's utility function

p_i: unit price of product i

B: budget

Based on the utility maximization concept, one can determine the demand function for product i.

Given that the price of one unit of product 1 is \$3, the available budget is \$20, and the consumer's utility function is $U(x_1, x_2) = 4x_1 x_2$. Assume products are infinitely divisible. Please derive the demand function for product 1. (25%)

3. If the demand curve for a good is given by D(p) = 12- 2*p, what price (p) will maximize revenue? At what value of price is the elasticity of demand equal to -1? Are these two values of price the same? If so, why? (25%)

4. Suppose that the customer has a demand function for orange juice of the form

$$x = 10 + \frac{m}{p}$$

where

x: the consumption of orange juice

p: unit price of orange juice

m: income

Originally, his income is \$120 per week and the price of orange juice is \$3 per unit. Now suppose that the price of orange juice falls to \$2 per unit. Please calculate the substitution effect and the income effect. (25%)