國立中興大學

110 學年度

碩士班考試入學招生

試　　題

學系：行銷學系

科目名稱：經濟學

國立中興大學110學年度碩士班招生考試試題

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本科目可以使用計算機　　本科目試題共 2 頁

1. (20 points) The inverse demand curve for product X is given by:

$$P_X = 25 - 0.005Q + 0.15P_Y,$$

where P_X represents price in dollars per unit, Q represents rate of sales in pounds per week, and P_Y represents selling price of another product Y in dollars per unit. The inverse supply curve of product X is given by: $P_X = 5 + 0.004Q$.

a. Determine the equilibrium price and sales of X. Let $P_Y = \$10$.
b. Determine whether X and Y are substitutes or complements.

2. (20 points) The demand curve for the new computer game, Rock and Roll Trivia, is given as follows:

$$Q = 200 - 5P - 0.1Pc - 0.5Pd + 0.2A - I$$

where P is the price of the game
Pc is the price of a computer
Pd is the price of a diskette
A is the level of advertising
I is the level of income
Q is the quantity sold

a. Suppose P = 10, Pc = 100, Pd = 2, A = 5, and I = 50. How many games will be sold?
b. Suppose P = 10, Pc = 100, Pd = 2, A = 5, and I = 50. What is the price elasticity of demand?

3. (20 points) Davy Metal Company produces brass fittings. Davy's engineers estimate the production function represented below as relevant for their long-run capital-labor decisions.

$$Q = 500L^{0.6}K^{0.8},$$

where Q = annual output measured in pounds,
L = labor measured in person hours,
K = capital measured in machine hours.

The marginal products of labor and capital are:

$$MP_L = 300L^{-0.4}K^{0.8} \qquad MP_K = 400L^{0.6}K^{-0.2}$$

Davy's employees are relatively highly skilled and earn $15 per hour. The firm estimates a rental charge of $50 per hour on capital. Davy forecasts annual costs of $500,000 per year, measured in real dollars.

a. Determine the firm's optimal capital-labor ratio, given the information above.
b. How much capital and labor should the firm employ, given the $500,000 budget? Calculate the firm's output.

4. (20 points) Conigan Box Company produces cardboard boxes that are sold in bundles of 1000 boxes. The market is highly competitive, with boxes currently selling for $100 per thousand. Conigan's total and marginal cost curves are:

$TC = 3{,}000{,}000 + 0.001Q^2$

$MC = 0.002Q$

where Q is measured in thousand box bundles per year.

   a. Calculate Conigan's profit maximizing quantity. Is the firm earning a profit?
   b. Analyze Conigan's position in terms of the shutdown condition. Should Conigan operate or shut down in the shortrun?

5. (10 points) Suppose there are seven firms in a market where the three largest firms supply 20% of the market-clearing quantity and the other four firms supply 10% of the market-clearing quantity. What is the five-firm concentration ratio (i.e., the share of total sales controlled by the five largest firms in the market)?

6. (10 points) Assume an endogenous growth model with a production function of the form $Y = F(K, AN)$ and where $y=2k$. If the savings rate is $s = 0.06$, the rate of population growth is $n = 0.05$, and the rate of depreciation is $d = 0.04$. What is the growth rate of real output per capita?