

ECONOMICS

Master Program Entrance Exam. of Dept. of Transportation and Communication Management, National Cheng Kung University

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Question 1. (25 points) Georgia always eats hot dogs in a bun together with 1 oz. of mustard. Each hot dog eaten in this way provides 15 units of utility and free disposal of surplus amounts of any one good is assumed.

(a) (10%) Explain the nature of Georgia's preference and write down her utility function. Draw the map of the indifference curve that gives her 15 units of utility. (Hint: It should be a 3-dimension map).

(b) (8%) Suppose that hot dogs cost \$1, buns cost \$0.4, and mustard costs \$0.1 per ounce and Georgia has income of I . What are the optimal amounts of these three items? Show how her maximum utility can be represented by income I .

(c) (7%) How should your answer to part (b) change if the price of hot dogs rose to \$1.5?

Question 2. (25 points) A steel company produces a harmful chemical in its production process. This harmful chemical is placed in barrels and buried in a landfill. The firm's production process is given by $q = 5KH$, where q = the tons of steel produced, H = the barrels of harmful chemical produced, and K = the machine hours of capital employed. The firm currently faces no regulation. Without regulation, it costs the firm \$15 to bury each barrel of the chemical. The cost of capital is \$60 per hour. The operating budget for the firm is \$120,000 per year.

(a) (3%) What is the firm's optimal ratio of the harmful chemical to capital?

(b) (7%) Given the firm's operating budget, how much capital and how much of the harmful chemical should the firm use?

(c) (8%) The EPA (Environmental Protection Agency) now imposes a \$15 effluent fee per barrel of harmful chemical that is buried. If the firm wants to maintain the same level of output after the imposition of the fees, how much capital and harmful chemical should the firm use (in order to minimize its operating cost)?

(d) (7%) How much will the firm pay in effluent fees?

Question 3. (25 points) Consider a monopolist who produces two goods, 1 and 2. (For instance, Microsoft Corp. produces Windows 2000 and Internet Explorer browser 5.0). The average costs of good 1 and good 2 are \$20 and \$30, respectively. There are 4 potential consumers for his products. The

(背面仍有題目,請繼續作答)

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valuations (v_1, v_2) for good 1 and good 2 of each consumer are as follows: $(\$10, \$90)$, $(\$45, \$55)$, $(\$60, \$40)$, $(\$90, \$10)$. Each consumer wants to buy *at most* one unit of each good. The consumers view the two goods to be perfect substitutes. That is, the valuation of the bundle which consists of one unit of good 1 and good 2 is the sum of the valuations of one unit of each good. For example, the 2nd consumer is willing to pay \$45 for one unit of good 1, \$55 for one unit of good 2, and \$100 ($=\$45 + \55) for the bundle which consists of one unit of good 1 and good 2. Consider the following two marketing strategies of the monopolists: the pure components strategy and pure bundling strategy.

(a) (10%) The pure components strategy: selling the two products separately. That is, the monopolist sets the prices p_1 and p_2 for product 1 and product 2, separately. What are the profit-maximizing prices p_1 and p_2 ?

(b) (10%) The pure bundling strategy: selling the two products together. That is, the monopolist sets the price p_B only for the bundle. What is the profit-maximizing price p_B ?

(c) (5%) Compare the maximum profits in part (a) and (b). Which one is the optimal marketing strategy of the monopolist?

(Hint: Draw first the preference graph where v_1 is on the horizontal axes and v_2 is on the vertical axes, and start your thinking from here.)

Question 4. (25 points) When the economies of Indonesia, Korea, Thailand, Malaya, and the Philippines entered into recession in 1997, the International Monetary Fund (IMF) made loans but only on condition that the recipients of the loans increased interest rates, raised taxes, and cut government expenditures. Please answer the following questions in words (and in a graph if necessary).

(a) (2%) Would you describe the IMF prescription as a feedback-rule policy (Keynesian activism) or a fixed-rule policy (Monetarism)?

(b) (8%) What do you predict the effects of the IMF policies would be?

(c) (8%) Do you have any criticisms of the IMF policies? What would you have required these countries to do? Why?

(d) (7%) Briefly explain the reasons that caused the 1997 south-eastern Asian economic crises.