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國立臺灣大學 108 學年度碩士班招生考試試題

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1. (15%)

(a) A firm has a production function given by $f(x_1, x_2, x_3, x_4) = \min\{2x_1 + x_2, x_3 + 2x_4\}$. What is the cost function for this technology? What is the conditional demand function for factor 1 and 2 as a function of factor prices (w_1, w_2, w_3, w_4) and output y?

(b) A firm has a production function given by $f(x_1, x_2) = \min\{2x_1 + x_2, x_1 + 2x_2\}$. What is the cost function for this technology? What is the conditional demand function for factor 1 and 2 as a function of factor prices (w_1, w_2) and output y?

(c) A firm uses 4 inputs to produce 1 output. The production function is $f(x_1, x_2, x_3, x_4) = \min\{x_1, x_2\} + \min\{x_3, x_4\}$. What is the vector of conditional factor demands to produce i unit of output when the factor price vector is w = (1,2,3,4)? What is the cost function? What kind of returns to scale does this technology exhibit?

2. (20%)

(a) A firm has a cost function $c(y) = \begin{cases} y^2 + 1 & if \ y > 0 \\ 0 & if \ y = 0 \end{cases}$

Let p be the price of output, and let the factor prices be fixed. If p = 2 how much will the firm produce? If p = 1 how much will the firm produce? What is the profit function of this firm?

(b) Compute the cost function for the technology
$$v(y) = \{(x_1, x_2, x_3): x_1 + \min(x_2, x_3) \geq 3y\}$$

3. (15%) Person A has a utility function of $u_A(x_1, x_2) = x_1 + x_2$ and person B has a utility function of $u_B(x_1, x_2) = \max(x_1, x_2)$. Agent A and agent B have identical endowments of (1/2,1/2).

(a) Illustrate this situation in an Edgeworth box diagram.

(b) What is the equilibrium relationship between p_1 and p_2?

(c) What is the equilibrium allocation?

4. (30%) 中美貿易戰愈演愈烈。2018 年四月，美國川普為了減少美中貿易赤字，對部分中國進口產品施以 10%~25%的關稅。同時，川普大輻減稅刺激經濟，特別是希望能吸引美企將生產從中國移回美國生產。然而，直到 2018 年底，美國每月對中國的貿易赤字，逐月攀升，而非減少。請用 IS-LM model 說明，為美國沒減少對中逆差，反而加劇(10%)?除此之外, 請說明貿易保護政策長期而言對本國的消費和就業有何影響(10%)?請從 economic identity 推導出，美國要減少美中貿易赤字的根本辦法，是提升儲蓄率 (10%)。

見背面

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5. (10%) 中國 2018 年的人均收入是 9900 美元，即將躍出中等收入陷阱，向 OECD 國家人均收入收斂。然而，中國在 1979 年的人均收入是 155 美元，比非洲國家窮。請用 Solow model 解釋中國這四十年來的經濟成長奇蹟。

6. (10%) 目前美國的 GDP 約是 20 兆美元，中國的 GDP 約是 12 兆美元。美國的 GDP 成長率約 2%，中國的 GDP 成長率約 6%，照此發展下去，約需幾年，中國將成為世界最大經濟體？

試題隨卷繳回