

國立成功大學

113學年度碩士班招生考試試題

編 號：325

系 所：經濟學系

科 目：個體經濟學

日 期：0201

節 次：第 2 節

備 註：不可使用計算機

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

一、簡答題：(90 分，每題 6 分。計算過程不列入計分，不用寫出計算過程，只要寫出答案即可。請標示題號並將答案依題號次序寫在答案卷上)

1. Emma has a perfect substitutes preference \succeq . She is indifferent between bundles (10,6) and (5,16). Find a utility function $u(x, y)$ representing \succeq .
2. A market has only two consumers. Consumer 1's demand function is $Q_1(p) = 120 - 2p$ and consumer 2's demand function is $Q_2(p) = 100 - p$. The market's total demand function is $Q(p)$. Find $Q(70)$.
3. David has a utility function $u(q_1, q_2) = \sqrt{q_1 q_2}$. He has income 300 and the prices of goods 1 and 2 are $(p_1, p_2) = (3, 5)$. Find David's best bundle.
4. Sophia has a utility function $u(q_1, q_2) = 2\sqrt{q_1} + q_2$. Her income is Y and the prices of goods 1 and 2 are $(p_1, p_2) = (2, 10)$. Her best consumption quantity of good 2 is 0. Find the range of possible values for Y .
5. John has utility function $u(q_1, q_2) = (q_1 + 8)(q_2 + 15)$. John spends all of his income and his optimal bundle is (40,0). The price of good 1 is 5. The price of good 2 is p . Find the range of possible values for p .
6. Sophia has utility function $u(q_1, q_2) = \min(7q_1, 9q_2)$. Find her expenditure function $E(p_1, p_2, u)$, where u is the utility level.
7. A firm has production function $f(L, K) = LK + L$. The wage rate is 3 per hour and the rental rate of a unit of capital is 5. In the short run, the capital is fixed at $\bar{K} = 9$. Find the short run cost function $C(q)$.
8. John has a utility function $u(q_1, q_2) = \sqrt{q_1 q_2}$. He has income 12 and the prices of goods 1 and 2 are $(p_1, p_2) = (1, 1)$. Assume that the price of good 1 rises to 2. Find the Hicks substitution effect.
9. Emma has a utility function $u(q_1, q_2) = 2\sqrt{q_1} + 2\sqrt{q_2}$. Her income is Y and the prices of goods 1 and 2 are p_1 and p_2 , respectively. The uncompensated demand function for good 1 is $q_1(p_1, p_2, Y)$. Find $q_1(p_1, 1, Y)$.
10. In a Cournot model of duopoly, the market inverse demand function is $p = 80 - Q$. Firm 1 has constant marginal cost $MC = 4$ and firm 2 has constant marginal cost $MC = 6$. What is the Nash equilibrium?
11. A firm has production function $f(L, K)$. The wage rate is 30 per hour and the rental rate of a unit of capital is 5. In the short run, the capital is fixed at $\bar{K} = 18$ and the firm has constant marginal cost $MC = 15$. Find $\frac{d}{dL} f(L, 18)$.
12. In the long run, a competitive firm has the cost function $C(q) = 2\sqrt{2}q^2$. The firm has supply function $S(p)$. Find $S(12\sqrt{2})$.
13. A consumer has a utility function $u(q_1, q_2) = q_1^a q_2^b$, where $a, b > 0$. The compensated demand function for good 1 is $H(p_1, p_2, u)$, where u is the utility level. Find $\frac{\partial H}{\partial p_1} \frac{p_1}{H}$.
14. John has a convex preference and he consumes goods 1 and 2 with prices (p_1, p_2) . John's compensated demand function for good 1 is $\frac{u}{3}$ where u is the utility level. We have known that, at $p_2 = 2$, the uncompensated demand function for good 1 is $\frac{Y}{p_1+3}$ where Y is John's income. Suppose that John spends

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his total income, Y , to consume his best bundle at prices $(p_1, p_2) = (1, 2)$ and he obtains utility u . Suppose that the price of good 1 rises from 1 to 2 and the total effect is -5 . Find John's compensating variation CV.

15. In a two-person pure exchange economy with goods 1 and 2, David has endowment $(1, 0)$ and Emma has endowment $(0, 1)$. They have the same utility function $u(q_1, q_2) = \sqrt{q_1 q_2}$. Find the aggregate excess demand function for good 1.

二、計算證明題：(10 分，計算證明過程列入計分，請標示題號並將計算證明過程寫在答案卷上)

A firm has production function $f(L, K) = L + K$. Find the elasticity of substitution of the isoquant $q = L + K$.