

國立成功大學
110學年度碩士班招生考試試題

編 號：347

系 所：經濟學系

科 目：個體經濟學

日 期：0202

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。

1. (15%) Consider an ultimatum game between player A and B. Player A moves first by proposing a way to split \$100 between the two before B determines whether to accept. The two split the money as proposed if B accepts; otherwise both obtain nothing. Suppose B's utility function is $u(M_B) = M_B$ and will prefer to accept if she is indifferent between to accept or not to.
 - a. (5%) Suppose A's utility function is $u(M_A) = M_A + kM_B$ where $0 < k < 1$. In words, A cares not only his own welfare but also B's. Find the way the two will split \$100.
 - b. (5%) Instead if A's utility function is $u(M_A) = \min(M_A, kM_B)$ where $0 < k < 1$, find again the way the two will split \$100.
 - c. (5%) Alternatively if A's utility function is $u(M_A) = M_A M_B^k$ where $0 < k < 1$, find again the way the two will split \$100.

2. (15%) Suppose medical masks are sold in a perfectly competitive market where its market demand is $Q = 240 - 2P$. Suppose each firm produces with the same cost function as $C(q) = 50 + 2q^2$ when its output level is q .
 - a. (5%) Suppose originally this market is in its long run equilibrium, find the equilibrium price.
 - b. (5%) Suppose the market experiences an increase in its market demand due to Covid-19. Find its short-run equilibrium price.
 - c. (5%) Aiming to increase the supply more quickly, suppose the government subsidizes each producer \$18 to cover part of their cost on machinery. Find again the eventual long-run equilibrium price after the increase in demand.

3. (20%) Consider a monopoly seller who is also a monopsony from which it hires labors. The firm produces with production function $Q = L^{1/2}$. Suppose the demand in the output market it faces is $Q = 16P^{-2}$ if the price is P while the supply in the labor market is $L = 2w$ if the wage rate is w .
 - a. (5%) Find the amount of labor it will hire.
 - b. (5%) If the firm acts as a competitive seller in the output market but remains a monopsony in the labor market, find again the amount of labor it will hire.
 - c. (5%) If the firm acts as a competitive buyer in the labor market but remains a monopoly in the output market, find again the amount of labor it will hire.
 - d. (5%) If the firm acts as a competitive seller in the output market and a competitive buyer in the labor market, find again the amount of labor it will hire.

4. (15%) Consider a monopolist facing the market demand $Q = 100 - P$ while producing with a constant marginal cost of c per unit.
- (10%) Instead of directly finding a price, suppose the monopoly searches for a markup ratio, k , of its marginal cost, c , so that its price is kc in order to maximize its profit, find its optimal k .
 - (5%) Verify how the optimal k will change in response to the rise in c .
5. (15%) Consider the production function of the firm as $Q = [\alpha L^\rho + (1 - \alpha)K^\rho]^{\frac{1}{\rho}}$ where $0 < \alpha < 1$ and $\rho > -1$. The firm is a competitive buyer in both input markets facing the price of L and K as w and r separately.
- (5%) Verify if the technology is constant, increasing, or decreasing returns to scale.
 - (5%) Verify if its isoquant is convex to the origin.
 - (5%) Derive its coefficient of elasticity of substitution.
6. (20%) Consider a duopoly where each firm produces with the cost function $c(q) = 500 + 20q + q^2$ when its output level is q . Suppose the market demand is $Q = 200 - P$.
- (10%) Find the output level of each firm at the Nash equilibrium when they engage in quantity competition.
 - (10%) Find the deadweight loss caused by the duopoly when firms compete in quantity.