系級	經濟學系碩士班	考試時間	100 分鐘
科目	經濟學	本科總分	100 分

※一律作答於答案卷上(題上作答不予計分)；並務必標明題號，依序作答。

1. Consider a model in which an individual lives only two periods. An individual's lifetime utility function is $\ln c_0 + 0.9\ln c_1$, where c_0 and c_1 are his consumption in first and second period. Suppose he receives an income of \$ 15,000 in period 1 and an income of \$ 4,400 in period 2. The private interest rate is 10 percent per period, and the person can borrow or lend money at this rate. Assume also that the person intends to consume all of his income over his lifetime (that is, he won't leave any money for his heirs).

   (a) State the intertemporal budget constraint. (5%)

   (b) What is the individual's optimal consumption in each period? (10%)

   (c) Now assume there is a Social Security program that takes \$ 3,000 from the individual in the first period and pays him this amount with interest in the second period. What is the impact of this system on the person's saving? (5%)

   (d) What happens to the slope of the budget constraint if the interest rate rises to 20 percent? (5%)

2. Consider a competitive firm who hires labor L with wages w and rents capital K with rental rates r to produce goods Y with the technology: $Y = F(K,L) = K^{\alpha} L^{1-\alpha}$. The firm seeks to maximize its profit. Derive the optimal conditions for the firm. (10%)

3. For a particular competitive firm, the minimum value of average variable cost (AVC) is \$3.5. The minimum value of short run average total cost (SATC) is \$4.5 and is reached when 60 units of output are produced. The minimum value of long run average total cost (LATC) is \$4 and is reached when 50 units of output are produced. Suppose the market demand is $Q^d = 7000 - 500P$ and the market supply is $Q^s = 4000 + 250P$.

   (a) What will the firm do in the short run if the price of its product is \$3? (5%)

   (b) What is the equilibrium market price? Is it long run or short run equilibrium? (5%)

   (c) How many firms will be in the market in the long-run equilibrium? (5%)

4. An economic has the per-worker production function $y_t = 3k_t^{0.5}$ where y_t is output per worker and k_t is the capital-labor ratio. The depreciation rate is 0.1, and the population growth rate is 0.05. Suppose saving rate is 0.3,

   (a) what are the steady-state values of the capital-labor ratio, output per worker, and consumption per worker? (15%)

   (b) What is the golden rule saving rate? (5%)

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5. Consider the following economy:

Desired consumption $\quad C^d = 1275 + 0.5(Y - T) - 200r$.

Desired investment $\quad I^d = 900 - 200r$.

Real money demand $\quad L = 0.5Y - 200(r + \pi^e)$.

Full-employment output $\quad \bar{Y} = 4600$.

Expected inflation $\quad \pi^e = 0$.

(a) Suppose that $T = G = 450$ and that $M = 9000$. Find an equation describing the IS curve. (Hint: Set desired national saving and desired investment equal, and solve for the relationship for between r and Y, given P.) (5%)

(b) Find an equation for the aggregate demand curve. (Hint: Use the IS and LM equations to find a relationship between Y and P.) (5%)

(c) What are the short-run general equilibrium values of output, consumption, investment, and the real interest rate when the price level is fixed at 5? (10%)

(d) What are the long-run general equilibrium values of output, consumption, investment, the real interest rate, and price level? (10%)