

科目：經濟學 適用：財金所

編號：351

考生注意：

1. 依次序作答，只要標明題號，不必抄題。
2. 答案必須寫在答案卷上，否則不予計分。
3. 限用藍、黑色筆作答；試題須隨卷繳回。

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注意事項：Students should write down the detailed computations or explanations in order to get the points.

1. 解釋名詞(每一小題 3%)

- a. Von Neumann-Morgenstern Utility Function
- b. Arrow-Pratt measure of Relative Risk Aversion
- c. The First Theorem of Welfare Economics
- d. Walras' Law
- e. Nash Equilibrium

2. 設市場只有 x 及 y 二物品，效用函數(utility function)為 $U(x, y) = 2x^{0.4}y^{0.6}$ ， y 之價格為 $P_y = 1$ ，

所得為 $I = 600$ ，

- a. (5%) x 之價格為 $P_x = 2$ ，問效用最大時的 x 及 y 消費量為何？
- b. (5%) x 的需求函數為何
- c. (5%) 現行公司 x 產品定價為 3 元，你認為公司降價可以增加收入嗎？證明之

3. (5%) 採取第三級價格歧視下的廠商下，其獨占廠商之成本函數為

$$TC = 50 + 40(Q_1 + Q_2)$$

市場一及二的需求函數(demand function)分別為

$$P_1 = 80 - 2.5Q_1$$

$$P_2 = 70 - 1.5Q_2$$

求該廠商在市場一與市場二所銷售之金額和數量？

4. (5%) 若效用函數為 $U = C_1^{\frac{1}{2}} + \frac{1}{1+\rho} C_2^{\frac{1}{2}}$ ，其中 $\rho = 0.25$ 。令兩期消費價格均為 1，兩期所得為

$Y_1 = 200$ ， $Y_2 = 250$ ，則利率 6% 時，此人在第一期借入或貸出金額多少？

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5. 假設在效用最大下並考慮完財富等相關因素後，得到邊際效用方程式如下：

$$u'(C_t) = E_t[\beta R_t u'(C_{t+1})], \quad t = 1, 2, \dots$$

其中： C_t 表示在 t 時點的消費

$u'(\cdot)$ 表示效用的一階微分

$E_t(\cdot)$ 表示在 t 時點的期望值

β 表示時間偏好率

$$R_t = \frac{p_{t+1} + d_{t+1}}{p_t}, \quad p_t \text{ 為股票在 } t \text{ 時點的價格，} d_t \text{ 為在 } t \text{ 時點的股利。}$$

請回答以下問題：

a. (5%) 由以上方程式證明

$$p_t = E_t\left[\sum_{j=1}^{\infty} \beta^j \frac{u'(C_{t+j})}{u'(C_t)} d_{t+j}\right]$$

b. (5%) 令效用函數在 t 時點為 $u(C_t) = \ln C_t$ ，另一方面， d_t 為 Markov 序列(即 $E_t(d_{t+j}) = d_t$)，

證明並解釋下式： $p_t = \frac{\beta}{1-\beta} d_t$

6. (6%) Kevin Wang is paid \$3,000 every 30 days. His salary is deposited directly in his bank. He spends all his money at a constant rate over the 30 days and must pay cash. He can (1) withdraw all of the money at once; (2) withdraw half at once and the rest after 15 days; (3) withdraw one-third at once, one-third after 10 days, and one-third at 20 days; or (4) make any number of evenly spaced withdrawals. Each withdrawal costs him \$2 in terms of time and inconvenience. For each day that Kevin has a dollar in the bank, he gets .03 cents (.0003 per dollar) in interest. Thus, if he withdraws half of his money immediately and half in 15 days, he has \$1,500 in the bank for 15 days and earns \$6.75 interest.

(a) How many withdrawals per month lead to the largest net earnings?

(b) If Kevin chooses this number, what will be his average amount of cash on hand over the 30 days?

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7. (10%) Assume that a large open economy with a floating exchange rate is described in the short run by the equations: $C = 0.5(Y - T)$; $T = 1,000$; $I = 1,500 - 250r$; $G = 1,500$; $NX = 1,000 - 250e$

$$C + I + G + NX = Y; M/P = 0.5Y - 500r; M = 1,000; CF = 500 - 250r; NX = CF$$

The last two equations specify that CF , net capital outflow, decreases with r , the interest rate, and that NX , the net exports, is equal to net capital outflow. NX is also related to the exchange rate, e , and falls when e appreciates. The price level (P) is fixed at 1.0. Calculate short-run equilibrium values of Y , r , C , I , CF , NX , e , private saving, public saving, and foreign saving that is defined here as minus NX .

For the following three questions, be sure to label: i. the axes; ii. the curves; iii. the initial equilibrium levels; iv. the direction the curves shift; and v. the new short-run equilibrium.

8. (10%) Suppose that technological change is not labor-augmenting, but affects only capital. Use the Solow growth model with depreciation rate (δ), saving rate (s), population growth rate (n), and technological progress rate (g) to **explain and graphically illustrate** the impact of the slower rate of technological change that increases the rate at which capital wears out on the steady-state capital-labor ratio and the steady-state level of output per worker.

9. (14%) In early 1994, Mexico was adhering to a fixed-exchange-rate system. Use the Mundell-Fleming model to **explain and illustrate graphically** the short-run impact on the exchange rate and level of output of increased country risk caused by the Chiapas uprising and the assassination of presidential candidate Colosio.

10. (10%) Economic expansion throughout the rest of the world raises the world interest rate. Use the Mundell-Fleming model to **explain and illustrate graphically** the impact of an increase in the world interest rate on the exchange rate and level of output in a small open economy with a floating-exchange-rate system.