

科目：總體經濟學 適用：經濟所

編號：331

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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1. (25 points) Consider the production function:

$$Y = AK^\alpha N^\beta, \quad (1)$$

where Y is total output, K is capital, N is labor force, and A is total factor productivity. The growth accounting equation can be expressed as:

$$g_Y = g_A + \alpha g_K + \beta g_N, \quad (2)$$

where g denotes the growth rate.

- a. (5 points) Derive equation (2) from equation (1).
 - b. (5 points) Give two factors which may cause the Solow residual (g_A) to change.
 - c. (5 points) Let $k = K/N$, what is g_k at the steady state in the Solow growth model?
 - d. (5 points) Continuously given the situation in part (c), what is the Golden Rule k ? Draw a plausible diagram to explain your answer.
 - e. (5 points) How does the production function in an endogenous growth model differ from the function in the Solow model?
2. (15 points) Due to a change in the regulatory structure of a small open economy, the desired capital stock becomes higher for both private investment and government investment. Increased government investment spending is financed by borrowing, not by higher taxes. If both desired investment and government spending rise at the same time, will there be "twin deficits"? Draw a plausible diagram to explain your answer.
3. (10 points) Equilibrium in the asset market occurs when the quantity of money supplied equals the quantity of money demanded. Use this condition to analyze the relationship between the inflation and the growth rate of the nominal money supply.

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4. (30 points) According to the Keynesian model, what is the effect of each of the following on output, real interest rate, employment and the price level? Distinguish between short-run and long-run. Please use the diagrams of IS-LM-FE (full employment output level), AD-AS and effective labor demand curve to explain.

- a. (15 points) The introduction of sophisticated credit cards reduces the need for consumers to hold cash.
- b. (15 points) A powerful typhoon causes sharp declines in agricultural output and increases in food prices.

5. (10 points) Consider an open economy described by the following equations:

$$Y = C + I + G + NX,$$

$$Y = 5500,$$

$$G = 1500,$$

$$T = 1500,$$

$$C = 250 + 0.75(Y - T),$$

$$I = 1000 - 50r,$$

$$NX = 500 - 500\varepsilon,$$

$$r = r^* = 5,$$

(Y : output, C : consumption, I : investment, G : government purchase, NX : net exports, T : tax, r : domestic interest rate, ε : exchange rate, r^* : world interest rate)

- a. (5 points) In this economy, solve for national saving, investment, the trade balance, and the equilibrium exchange rate.
- b. (5 points) Now suppose that G rises from 1500 to 1750. Solve for national saving, investment, the trade balance, and the equilibrium exchange rate. Please compare your answers from parts (a) and (b) to explain the difference.

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6. (10 points) Many economic variables are related to the business cycle. According to the direction of aggregate economic activity, we can identify whether a variable is procyclical (same direction as aggregate activity), countercyclical (opposite direction) or acyclical (uncertain direction). On the other hand, an economic variable can be classified as a leading variable, lagging variable and coincident variable based on the timing of the variable's turning points related to the turning point of the business cycle. Please fill in the following table according to the direction and timing of economic variables.

Variable	Direction	Timing
Industrial Production		
Employment		
Money Supply		
Stock Price		
Nominal Interest Rates		