

# 國立中央大學 107 學年度碩士班考試入學試題

所別：經濟學系 碩士班 不分組(一般生)

共2頁 第1頁

科目：總體經濟學

本科考試禁用計算器

\*請在答案卷(卡)內作答

請依題號寫下答案

一、是非不定繪圖題：每題 8 分，共 48 分。請先回答是或非，再繪圖並說明理由；

**沒寫理由或沒繪圖均以零分計。**

1. The recent tax reform of the US will cause Taiwan's short-run equilibrium output level in the AD-AS model to increase.
2. Suppose that unemployment results from the minimum-wage law. Other things equal, the higher the labor-force participation rate, the higher the unemployment rate.
3. In the IS-LM and AD-AS models, an increase in the expected inflation rate causes both the short-run equilibrium interest rate and equilibrium general price level to rise.
4. Consider the market for loanable funds. Other things equal, the domestic investment increases when people value future consumption more.
5. Suppose that the money supply remains fixed. Other things equal, the value of money increases with the interest rate.
6. According to the PPP theory and AD-AS model, other things equal, the currency of country A appreciates against that of country B if the natural rate of unemployment of country A rises.

**注意：背面有試題**

參考用

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二、問答題：共 52 分。沒有推導過程或沒寫理由均以零分計。

7. The IS and LM curves for the economy have the following equations:

$$IS: Y = A - 50r$$

$$LM: Y = 5(M/P) + 50r$$

where  $Y$  is real output,  $r$  is interest rate,  $A$  is autonomous spending,  $M$  is nominal monetary aggregate, and  $P$  is price level. Suppose that  $P=1.0$ ,  $A=250$ , and  $M=20$ .

- (a) (4 分) Find the equilibrium real output and the equilibrium interest rate.
- (b) (4 分) What are the equilibrium real output and equilibrium interest rate when the price level  $P$  changes to 2.0?
- (c) (4 分) Plot the IS-LM diagram and the aggregate demand (AD) curve based on your answers in (a) and (b).
- (d) (4 分) A Pigou Effect is introduced into this model by allowing the autonomous spending  $A$  to become price-dependent. We now have:

$$IS: Y = A - 50r$$

$$LM: Y = 5(M/P) + 50r$$

$$A = 140 + 60/P$$

$$P = 1, M=20$$

Find the equilibrium real output and the equilibrium interest rate.

- (e) (4 分) Continue from (d). Find the equilibrium real output and equilibrium interest rate when the price level  $P$  changes to 2.0? Is the AD curve in this case flatter or steeper than the AD curve without the Pigou Effect? (Note: AD curve has prices on the vertical axis and real output on the horizontal axis)
8. Consider the following growth model, where  $Y$  is output,  $K$  is capital,  $I$  is investment,  $S$  is saving,  $L$  is the number of population (or labor), and  $E$  is the efficiency of labor. The capital depreciation rate  $\delta$  and the saving rate  $x$  are constant.

$$K_{t+1} = (1-\delta)K_t + I_t \quad (\text{capital accumulation})$$

$$I_t = S_t = xY_t \quad (\text{investment = saving})$$

$$Y_t = K_t^{1/2}(E_t \cdot L_t)^{1/2} \quad (\text{production function})$$

注意:背面有試題

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- (a) (5分) Based on the production function, write the output per-capita ( $y \equiv Y/L$ ) as a function of capital per-capita ( $k \equiv K/L$ ) and efficiency of labor ( $E$ ).
- (b) (4分) Suppose that the capital depreciation rate is  $\delta=0.05$ , saving rate is  $s=0.1$ , and the population size is fixed (i.e. no population growth). Derive the steady-state capital per-capita ( $k$ ) as a function of the efficiency level  $E$ . Derive the steady-state output per-capita ( $y$ ) as a function of  $E$ .
- (c) (4分) All conditions in (b) remain the same except that the population growth rate ( $n$ ) is  $n=3\%$ . Derive the steady-state capital per-capita ( $k$ ) as a function of the efficiency level  $E$ .
- (d) (4分) If the growth rate of the labor efficiency is 6% per year and the population growth rate is 3% per year. What is the growth rate of the capital per capita ( $k$ ) in the steady-state? What is the growth rate of capital ( $K$ ) in the steady-state?
9. Consider a two-period model in which each individual maximizes his lifetime utility  $U$ , with  $C_1$  and  $C_2$  being the consumption levels in the first and second periods, respectively. The individual has income  $Y$  in the first period and no income in the second period. Let  $r$  denote the interest rate. All variables are in real terms. Suppose that the utility function has the following form:

$$U = -\frac{(4-C_1)^2}{2} + C_2$$

In the first period, the individual saves  $S$  and consumes  $C_1$ :

$$S = Y - C_1$$

In the second period, the individual consumes the principal and interest on its saving:

$$C_2 = (1+r)S$$

- (a) (5分) Derive the individual's saving as a function of  $Y$  and  $r$ .
- (b) (5分) Suppose the government starts to levy lump-sum tax  $T_1$  in the first period and gives transfer payment  $T_2$  to individual in the second period. Revise this individual's life-time budget constraint and derive for the saving function.
- (c) (5分) Continue from (b). Suppose the interest rate remains unchanged. When the government raises  $T_1$  and reduces  $T_2$ , how would  $C_1$  and  $S$  change?