

※ 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。

Problem 1 單選題，共 10 題，每題 5 分。

1. From 1980 to 2000, the yen-dollar exchange rate fell from 240 yen/dollar to 102 yen/dollar, while the dollar-pound exchange rate fell from 2.22 dollars/pound to 1.62 dollars/pound. As a result
 - (A) the dollar appreciated relative to the yen, but depreciated relative to the pound.
 - (B) the dollar depreciated relative to the yen, but appreciated relative to the pound.
 - (C) the dollar appreciated relative to both the yen and the pound.
 - (D) the dollar depreciated relative to both the yen and the pound.
2. Intel produces CPUs that it sells to DELL, which uses the CPU as a component of its computers. In the national income accounts, the CPUs are classified as
 - (A) inventory.
 - (B) final goods.
 - (C) capital goods.
 - (D) intermediate goods.
3. Classical economists think that lump-sum tax changes
 - (A) should be used to smooth business cycles.
 - (B) have a powerful effect on the economy.
 - (C) affect aggregate demand after a lag.
 - (D) have no effect because of Ricardian equivalence.
4. Wakanda specializes in the production of cotton. However, cotton manufacturers in Wakanda are expecting the demand for its exports to fall sharply due to growing competition from a neighboring country. Assuming all else equal, which of the following is likely to happen in this case?
 - (A) Investment expenditure in Wakanda will rise.
 - (B) The equilibrium unemployment in Wakanda will fall.
 - (C) Consumption expenditure in Wakanda will fall.
 - (D) The equilibrium real wage in Wakanda will rise.
5. The _____ nature of economic growth is one of the major reasons why there are large differences in GDP per capita across countries.
 - (A) linear

- (B) exponential
(C) logarithmic
(D) quadratic
6. Assume that the inflation rate in an economy is measured on the vertical axis and the annualized growth rate of money supply minus the annualized growth rate of real GDP is measured on the horizontal axis on a graph. If a curve is plotted to establish the relationship between both variables, the curve is likely to be:
- (A) vertical.
(B) horizontal.
(C) upward sloping.
(D) downward sloping.
7. In the classic one-sided job search model, the reservation wage
- (A) is the wage paid to the reserve army of the unemployed.
(B) is the wage at which an unemployed worker is just indifferent to accepting a job and turning it down.
(C) should be the same as the employment insurance benefit, if employment insurance is to be efficient.
(D) cannot be higher than the employment insurance benefit.
8. According to real business cycle theory
- (A) monetary policy is driving business cycles.
(B) Federal Reserve actions need to be watched closely.
(C) technology shocks have a major role in business cycles.
(D) cash-in-advance is necessarily to explain business cycles.
9. Let P_t be the price of one unit of a market basket of goods (i.e., a composite commodity) in year t , P_{t+1}^e be the expected price of one unit of a market basket of goods in year $t+1$; π_{t+1}^e be the expected rate of inflation between period t and $t+1$ and i_t be the one-year nominal interest rate. Suppose an individual borrows the equivalent of one unit of a composite commodity today. Given this information, which of the following expressions represents the real interest rate (r_t)?
- (A) $\frac{(1+i_t)P_t}{P_{t+1}^e} - 1$
(B) $\frac{(1+i_t)P_{t+1}^e}{P_t}$

- (C) $\frac{(1+\pi_{t+1}^e)}{1+i_t}$
 (D) $\frac{1+\pi_{t+1}^e}{1+i_t} - 1$

10. If a macroeconomic variable tends to aid in predicting the future path of real GDP, it is said to be a
- (A) convenient variable.
 (B) coincident variable.
 (C) leading variable.
 (D) lagging variable.

Problem 2

Consider a closed economy with a neoclassical production function, exogenous technological progress, A_t , a fixed saving rate, s , and a constant labor force, L , as described by the following equations

$$K_{t+1} - (1 - \delta)K_t = sY_t \quad (1)$$

$$Y_t = K_t^\alpha (A_t L)^{1-\alpha}, \quad \alpha \in (0, 1) \quad (2)$$

where $A_{t+1} = (1 + g)A_t$, $A_0 > 0$, and $\delta \in [0, 1]$ is the depreciation rate of physical capital.

- (5 points) Remove the trend from Equations (1) and (2) by writing all endogenous variables X_t in terms of efficiency units $x_t = \frac{X_t}{A_t L}$.
- (5 points) Compute the wage rate, w_t , and the rental rate of capital, r_t , in this economy.
- (5 points) Compute the stable steady-state capital stock per efficiency unit, k^* , of this economy.
- (5 points) Show that the capital stock per efficiency unit, k_t , is increasing over time as long as $0 < k_t < k^*$.
- (5 points) Suppose the economy is in a steady-state. What happens to the aggregate output, the wage rate, and the rental rate on impact if the number of workers in the economy increases by ∂L due to immigration?

Problem 3

Consider a representative agent economy in which the households live for two periods and solve the following problem

$$\max_{c_t, c_{t+1}, k_{t+1}} \log c_t + \beta \log c_{t+1}$$

subject to

$$c_t + s_t + k_{t+1} = y_t$$

$$c_{t+1} = (1 + r_t)s_t + f(k_{t+1})$$

where β denotes the discount factor, and c_t and c_{t+1} are the consumption in period t and $t + 1$, respectively. Moreover, y_t is the exogenous endowment at time t , and r_t is the exogenous interest rate. There is no endowment in time $t + 1$. The agent needs to save (s_t) or accumulate capital (k_{t+1}) for production in the next period. Last, $f(k_{t+1})$ is a concave production function.

- (5 points) Derive the Euler equation.
- (5 points) Use a graph to show the determination of the optimal capital level.
- (5 points) Show the effect of raising r_t on k_{t+1} : $\frac{dk_{t+1}}{dr_t}$. Is it positive or negative?

Now let $f(k_{t+1}) = k_{t+1}^\alpha$ and $\beta(1 + r_t) = 1$.

- (5 points) Solve for the optimal capital level as a function of r_t .
- (5 points) Solve for the optimal consumption as a function of r_t .