

※ 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。

1. (10%) Consider a Cobb-Douglas production function

$$Y = AK^\alpha L^{1-\alpha}$$

where Y , A , K and L represent output, TFP, capital and labor respectively. Suppose that the economy is growing at 5% Capital is growing at 7% and labor is growing at 4%. Capital share is given by 0.3. What is the Solow residual?

2. (10%) Briefly explain whether each of the following items is included in the calculation of GDP?

- a) (2%) Housework
- b) (2%) Government spending
- c) (2%) Inventory increases
- d) (2%) Transfer of used cars
- e) (2%) Haircut services

3. (20%) Consider a Solow model with Cobb-Douglas production function

$$Y = AK^\alpha L^{1-\alpha}$$

where Y , A , K and L represent output, TFP, capital and labor respectively. Let s be the saving rate.

- a) (5%) Derive the evolution of capital per capita, denoted by k (An expression of k_{t+1} as a function of k_t).
- b) (5%) Derive the capital per capita, k , in the steady state.
- c) (5%) Derive the Golden rule consumption per capita.
- d) (5%) Compare part (c) with a Ramsey model. Did the result coincide with the steady state of a Ramsey model? Why or why not?

4. (10%) Suggest a sufficient condition for sustained growth in a neoclassical growth model. Explain and give an example to support your results.

5. (10%) Russian economy, with the benefits of the high oil price, has been growing fast during the last decade. However, it has suffered a tremendous downfall with the oil price plummets. Explain the rise and the fall of the Russian economy with an economic model.

6. (20%) Consider an infinitely-lived agent with utility given by

$$\sum_{t=0}^{\infty} \frac{C_t^{1-\sigma}}{1-\sigma}$$

subject to the budget constraints

$$C_t + S_t + T_t = Y_t + (1+r)S_{t-1}$$

where C_t , S_t , T_t and Y_t represent consumption, saving, tax and output at time t respectively.

Production function is given by the following Cobb-Douglas form

$$Y = AK^\alpha L^{1-\alpha}$$

Finally, budget balance of the government results in

$$\sum_{t=0}^{\infty} \frac{T_t}{(1+r)^t} = \sum_{t=0}^{\infty} \frac{G_t}{(1+r)^t} \equiv \bar{G}$$

- a) (10%) Derive the first-order conditions for the agent.
- b) (10%) Does the optimal allocation affected by changes in T_t (assuming no changes in exogenous variables)? Why or why not? Prove your results.

7. (20%)

- a) (5%) Money has been widely used as a medium of exchange. Explain what is so special about money which allows it to serve its purposes. Give an example when money lost its functions and values.
- b) (5%) Explain why a standard macroeconomic model cannot induce people to hold money in equilibrium.
- c) (10%) Following from part (b), there are several ways developed in order to handle the problem. Two common ways are given as follows. Explain in each case how it can induce people to hold money in equilibrium and stretch a basic model to show the result.
 - i. Money-in-Utility (MIU) Model
 - ii. Cash-in-Advanced (CIA) Model