Intermediate Macroeconomics
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Midterm Exam I (Open-Book)
Undergraduate Economics Program, HUST
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Name: _____ **Student ID:**_____

1. (5'×5 =25 points) Consider a closed economy, the **Yujia Village**, that produces and consumes only apples and oranges. The villagers here have a very strange custom: They always produce 1 apple and 2 oranges **together**, and consume 1 apple with 2 oranges. In 2000, it produced 100 apples, and the prices for apple and orange were ¥2 and ¥1, respectively. In 2015, 400 apples were produced within the village, and the prices became ¥5/apple and ¥5/orange. 2000 is taken as the base year.

(a) Suppose the Statistics Authority of the village decides to monitor the Consumer Price Index for each year. For this reason, the Village wants to build a basket of goods and services that is capable of representing a typical household's consumption behavior. How should the basket be constructed? Give a reasonable example of the basket and explain your answer.

(b) Based on your answer above, calculate the **CPI** and **GDP deflator** of Yujia Village in 2015.

(c) As illustrated in class, GDP deflator usually differs from CPI. Is this statement still true here? Explain your answer.

(d) The Yujia villagers produced 200 apples and 400 oranges in 2015. However, their generous neighbors, the Nanwang villagers, gave them 20 apples and 40 oranges *for free*. As a result, the Yujia Village consumed 220 apples and 440 oranges in 2015. Calculate the real and nominal GDP for Yujia Village in 2015.

(e) It is known that the unemployment rate of the economy in 2015 was 5%, with a population size of 500 and a labor force of 400 villagers. How many people were employed in 2015?

2. (5'+5'+5'+10'=25 points) Consider the Cobb-Douglas production function $F(K, L) = K^{\alpha}L^{1-\alpha}$, with $\alpha \in (0, 1)$.

(a) It is said that if each factor is paid its marginal product, then α measures the *capital share* of

total output. Prove it **mathematically**.

(b) It is known that, 65% of output in U.S. is distributed to labor as wages, and this percentage for China is only 40%. Write out your estimation of the Cobb-Douglas production functions for U.S. and China, respectively.

(c) Suppose, other things being equal, the government spending increases by 100 ($\Delta G = 100$). How does this change affect the private and public savings, respectively?

(d) Consider the model of the Loanable funds in Chapter 3, recall that the equilibrium is determined by $\bar{S} = I(r)$. Suppose the households become more willing to consume, given other things unchanged, how will this change affect the equilibrium real interest rate? Explain your answer

using figures as in your textbook and give the economic intuitions behind it.

3. (5' × 5+10=35 points) The following questions are based on Chapters 4-5 of your textbook.

(a) Suppose individuals hold no currency and all, i.e., $cr = 0$. The reserve ratio is $rr = 0.1$. And the monetary base increases by 100, i.e., $\Delta B = 100$. How will this change affect the money supply?

(b) What is Fed? What is Fed's main function?

(c) Suppose it is suddenly believed by the whole population that all banks are going bankrupt, and

there is no insurance system for deposits at all. How does this change affect the money supply?

(d) According to the *Quantity Theory of Money*, how does a change in money supply affect the real output of economy, **in the long run**?

(e) During the last 50 years, it is found that the annual growth rate of money supply of an economy is 5%, but no significant price change has been observed during the same period. How would you estimate the annual growth rate of real output of the economy during this period?

(f) Consider the equilibrium between the demand and supply of real money balances depicted by $\frac{M}{P} = L(r + E\pi, Y)$, where term $E\pi$ denotes people's expectation of the inflation rate in the following year, as defined in your textbook. Suppose the government announces that it will remain a much lower inflation rate starting from next year, but hold the money supply this year the same as the preceding year, and the real output always remains the same. Will this announcement change the current year's price level? Explain your answer.

4. (5'+10'=15 points) The following questions are based on Chapter 6 of your textbook.

(a) Suppose a McDonald's Big Mac sells at 3 dollars in U.S. and 330 yens in Japan. If the *law of one price* applies successfully to the Big Mac case, then what should be the nominal exchange rate between the U.S. dollar and The Japan yen?

(b) Consider a small open economy, in which a "Patriot Movement" has been prevailing. Specifically, the movement has successfully called for the boycott (抵制) of imported goods and services. The aim of the movement is to decrease imports and improve exports. Show why this goal could never be achieved.