

E-322: INTERMEDIATE MACROECONOMICS MIDTERM_1

PART 1 (Long Problems)

Directions: There would be two questions in this section. The first question is worth **30 points**, the second questions is worth **30 points**. Choose your time wisely.

Question 01: We have an economy that consists of five agents, a coal producer, an iron producer, a steel producer, a consumer and a government. Each of them has the following economic activities:

The coal producer **produces** 20 million tons of coals and **sells** them at \$5.00 per ton. He **pays** \$60.00 million in wages to the consumer and pays \$10.00 million in tax.

The iron producer, **buys** 10 million tons of coal from the coal producer, **pays** wages of \$15 million to the consumer and pays \$11.00 million in tax. He **produces** 30.00 million tons of iron and **sells** them at \$3.00 per ton.

The steel producer **buys** 5.00 million tons of coal, 25.00 million tons of iron, **pays** \$18.00 million in wages and pays \$13.00 million as taxes. He **produces** 40.00 million tons of steel and **sells** them at \$6.00 per ton. Out of his production, he **exports** 10.00 million tons of steel at \$6.00 per ton.

The consumer **buys** 5.00 million tons of coal, 5.00 million tons of iron and 10.0 million tons of steel. He **pays** taxes of \$14.00 million.

The government **buys** 20.00 million tons of steel, **pays** \$17.00 million in wages to the consumer. It also **collects** taxes.

- 1) Calculate the GDP of this economy using the value added approach.
- 2) Calculate the GDP of this economy using the expenditure approach.
- 3) Calculate the GDP of this economy using the income approach.

Question 02: We have an economy that has only two goods, apples and oranges. The price and quantity of these goods for two years are given as follows:

Year 1		
Good	Quantity	Price
Apples	40	\$1.00
Oranges	80	\$2.00

Year 2		
Good	Quantity	Price
Apples	50	\$3.00
Oranges	100	\$4.00

Answer the following:

- 1) Calculate the percentage change in **nominal GDP** from year 1 to year 2
- 2) Calculate the percentage change in real GDP from year 1 to year 2 when **year 1 is the base year**.
- 3) Calculate the percentage change in real GDP from year 1 to year 2 when **year 2 is the base year**.
- 4) Calculate the percentage change in real GDP from year 1 to year 2 using the **chain weighted index**
- 5) Which measurement of inflation is more accurate? Explain why?

PART 2 (Short Problems)

Directions: There would be five questions in this section. Each question is worth 6 points. Choose your time wisely.

- 1) This question is related to the various calculations of GDP:
 - a) Why is the wage paid to the consumer not included in the value added approach to calculating GDP?
 - b) Give two examples of government transfer payments.
 - c) Why is Import subtracted from the calculation of GDP in expenditure approach?
 - d) Why is the tax paid by the consumers not included in the income of the government in the income approach to GDP?
 - e) Give examples of three components that are included in the income of the consumer.
 - f) Give examples of two important issues which GDP calculation fails to take into consideration.

- 2) This question is related to various issues of GDP calculation:
 - a) Give two example of net factor payment.
 - b) What are the different types of investment expenditure?
 - c) What kinds of expenditure made by the consumer are not included in the C when we are calculating the GDP using the expenditure approach? Give two examples.
 - d) What are the different layers of government expenditure that are included in G when we are calculating the GDP using the expenditure approach? Give examples. Of each level of government expenditure
 - e) What is not included in the G (but are actually spent by the government)? Why?
 - f) Give an example of an expenditure that can be included either in the C or in the I when we are calculating the GDP using the expenditure approach?
- 3) This question is related to various National account and price measurement issues.
 - a) Write down the formula for calculating the CPI.
 - b) Comparing between implicit GDP and CPI measure of price, which one is more volatile?
 - c) Which people are including in the labor force (LF)? Which people are not included in the LF?
 - d) Write down the equation for personal disposable income.
 - e) Write down equations for private savings and government savings.
 - f) Write down the savings-Investment identity when the current account (CA) is positive.
- 4) This question is related to various issues with business cycle
 - a) Define pro-cyclical, counter-cyclical and acyclical behavior.
 - b) Draw one graph explaining leading variable.
 - c) Draw a graph to explain lagging variable.
 - d) Give example of a variable that is procyclical and leading.
 - e) Give example of a variable that is countercyclical and coincident
 - f) Give example of a variable that is procyclical and coincident

- 5) This question is related to the Representative consumer in a macro model. We are thinking about an economy where the consumer has two goods to choose, leisure and C. the consumer has three sources of income, he gets w wage for I unit of time working, he gets dividend income which is denoted as π . Finally he pays lump sump tax T . C is the numeraire good (Price of C is 1). Let N^s be the total time he spends in working, L is the total time of leisure and H is the total time available.
- Write down the time constraint and the budget constraint of the consumer.
 - Draw the budget line for the consumer in the case $T > \pi$. Also draw the budget line for the consumer in the case $T < \pi$.
 - Why do we have a kink in the budget line when $T < \pi$? Can we have optimal consumption bundle at the kink? Why or why not?