

Homework 10 (84 Points)

Part I

Multiple Choices (2 Points Each)

1. One bag of flour is sold for \$1.00 to a bakery, which uses the flour to bake bread that is sold for \$3.00 to consumers. A second bag of flour is sold for \$1 to a grocery store who sells it to a consumer for \$2.00. Taking these four transactions into account, what is the effect on GDP?
 - (a) GDP increases by \$3.00.
 - (b) **GDP increases by \$5.00.**
 - (c) GDP increases by \$6.00.
 - (d) GDP increases by \$7.00.
2. In early 2010 Molly paid \$200,000 for a house built in 2000. She spent \$30,000 on new materials to remodel the house. Although Molly lived in the house after she remodeled it, its rental value rose. Which of the following contributed to GDP in 2010?
 - (a) the price of the house, the cost of remodeling materials, the increase in rental value
 - (b) the price of the house and the cost of remodeling materials, but not the increase in rental value
 - (c) the costs of the remodeling materials and the increase in rent, but not the price of the house
 - (d) **the costs of the remodeling materials and the rent in 2010, but not the price of the house**

3. Quality Motors is a Japanese-owned company that produces automobiles; all of its automobiles are produced in American plants. In 2008, Quality Motors produced \$25 million worth of automobiles and sold \$12 million in the U.S. and \$13 million in Mexico. In addition, it sold \$2 million from the previous year's inventory in the U.S.¹. The transactions just described contribute how much to U.S. GDP for 2008?
- (a) \$12 million
 - (b) \$14 million
 - (c) **\$25 million**
 - (d) \$27 million
4. The city of Xiamen buys a police car manufactured in Germany. In the GDP accounts this transaction is included in
- (a) government expenditures and exports.
 - (b) **government expenditures and imports.**
 - (c) exports, but not government expenditures.
 - (d) imports, but not government expenditures.
5. A stove is produced by a firm in 2014, added to the firm's inventory in 2014, and sold to a household in 2015. It follows that
- (a) **the value of the good is added to the investment category of 2014 GDP, added to the consumption category of 2015 GDP, and subtracted from the investment category of 2015 GDP.**
 - (b) the value of the good is added to the investment category of 2014 GDP, added to the consumption category of 2015 GDP, and not included in the investment category of 2015 GDP.
 - (c) the value of the good is added to the investment category of 2014 GDP, subtracted from the consumption category of 2015 GDP, and not included in the investment category of 2015 GDP.
 - (d) the value of the good is added to the investment category of 2014 GDP, subtracted from the consumption category of 2015 GDP, and added to the investment category of 2015 GDP.

¹assuming the inventory was both valued at and sold for \$2 million

6. Rocket Energy Drink Company buys sugar to produce energy drinks. At the end of a quarter both its inventory of sugar and its inventory of energy drinks has increased. Investment for the quarter will include
- (a) **both the increased inventory of sugar and the increased inventory of energy drinks.**
 - (b) the increased inventory of sugar, but not the increased inventory of energy drinks.
 - (c) the increased inventory of energy drinks, but not the increased inventory of sugar.
 - (d) neither the increased inventory of sugar nor the increased inventory of energy drinks.
7. AA Appliances sells refrigerators. In 2015 it added \$100,000 to its inventory. \$10,000 of this addition was from used refrigerators, and the remaining \$90,000 was from their purchases of newly manufactured refrigerators. How much of this addition to AA's inventory contributes to 2015 GDP?
- (a) \$0
 - (b) \$10,000
 - (c) **\$90,000**
 - (d) \$100,000
8. In 2014, a farmer grows and sells \$3 million worth of corn to Big Flakes Cereal Company. Big Flakes Cereal Company produces \$8 million worth of cereal in 2014, with sales to households during the year of \$7 million. The unsold \$1 million worth of cereal remains in Big Flake Cereal Company's inventory at the end of 2014. The transactions just described contribute how much to GDP for 2014?
- (a) \$3 million
 - (b) \$7 million
 - (c) **\$8 million**
 - (d) \$11 million

9. Consider two cars manufactured by Chevrolet in 2014. During 2014, Chevrolet sells one of the two cars to Emily for \$20,000. Later in the same year, Emily sells the car to Jim for \$22,000. The second automobile, valued by Chevrolet at \$19,000, is unsold at the end of 2014. The transactions just described contribute how much to GDP for 2014?
- (a) \$20,000
 - (b) \$22,000
 - (c) **\$39,000**
 - (d) \$41,000
10. Consider two cars manufactured by Chevrolet in 2014. During 2014, Chevrolet sells one of the two cars to a dealer for \$20,000. Later in the same year, the dealer sells the car to Jim for \$22,000. The second automobile, valued by Chevrolet at \$19,000, is unsold at the end of 2014. The transactions just described contribute how much to GDP for 2014?
- (a) \$20,000
 - (b) \$22,000
 - (c) \$39,000
 - (d) **\$41,000**
11. A German citizen buys an automobile produced in the United States by a Japanese company. As a result,
- (a) U.S. net exports increase, U.S. GDP is unaffected, Japanese GNP increases, German net exports decrease, and German GNP and GDP are unaffected.
 - (b) U.S. net exports and GDP increase, Japanese GNP increases, German net exports decrease, German GNP is unaffected, and German GDP decreases.
 - (c) **U.S. net exports and GDP increase, Japanese GNP increases, German net exports decrease, and German GNP and GDP are unaffected.**
 - (d) U.S. net exports and GDP are unaffected, Japanese GNP increases, and German net exports, GNP, and GDP decrease.

12. When an Egyptian construction firm purchases a cement mixer from Slovakia,
- (a) Egyptian investment does not change, Egyptian net exports decrease, Egyptian GDP decreases, Slovakian net exports increase, and Slovakian GDP increases.
 - (b) **Egyptian investment increases, Egyptian net exports decrease, Egyptian GDP is unaffected, Slovakian net exports increase, and Slovakian GDP increases.**
 - (c) Egyptian investment decreases, Egyptian net exports increase, Egyptian GDP is unaffected, Slovakian net exports decrease, and Slovakian GDP decreases.
 - (d) Egyptian investment increases, Egyptian net exports do not change, Egyptian GDP increases, Slovakian net exports do not change, and Slovakian GDP is unaffected.
13. In the economy of Talikastan in 2015, consumption was two-thirds of GDP, government purchases were \$1000 more than investment, investment was one-ninth of GDP, and the value of exports exceeded the value of imports by \$500. What was Talikastan's GDP in 2015?
- (a) \$1688
 - (b) \$9000
 - (c) **\$13,500**
 - (d) \$15,000
14. In an imaginary economy, consumers buy only sandwiches and magazines. The fixed basket consists of 20 sandwiches and 30 magazines. In 2006, a sandwich cost \$4 and a magazine cost \$2. In 2007, a sandwich cost \$5. The base year is 2006. If the consumer price index in 2007 was 125, then how much did a magazine cost in 2007?
- (a) \$0.83
 - (b) \$2.25
 - (c) **\$2.50**
 - (d) \$3.00

15. Suppose the price of a quart of milk rises from \$1.00 to \$1.20 and the price of a T-shirt rises from \$8.00 to \$9.60. If the CPI rises from 150 to 195, then people likely will buy
- (a) **more milk and more T-shirts.**
 - (b) more milk and fewer T-shirts.
 - (c) less milk and more T-shirts.
 - (d) less milk and fewer T-shirts.
16. Assume most athletic apparel bought by U.S. consumers is imported from other nations. If all else is constant, an increase in the price of foreign-made athletic apparel will cause the U.S.
- (a) consumer price index and GDP deflator to increase by exactly the same amount.
 - (b) GDP deflator to increase more than the consumer price index.
 - (c) **consumer price index to increase more than the GDP deflator.**
 - (d) GDP deflator to decrease less than the consumer price index.
17. Ethel purchased a bag of groceries in 1970 for \$8. She purchased the same bag of groceries in 2006 for \$25. If the price index was 38.8 in 1970 and the price index was 180 in 2006, then what is the price of the 1970 bag of groceries in 2006 dollars?
- (a) \$5.39
 - (b) \$25.00
 - (c) \$29.11
 - (d) **\$37.11**
18. The consumer price index was 120 in 2013 and 126 in 2014. The nominal interest rate during this period was 8 percent. What was the real interest rate during this period?
- (a) **3 percent**
 - (b) 2 percent
 - (c) 3.3 percent
 - (d) 12.8 percent

19. The nominal interest rate for a consumer loan lasting from 2007 to 2008 is 8.5 percent and the real interest rate is 4.5 percent. If the consumer price index was 200 in 2007, what would the consumer price index value be in 2008?
- (a) 192
 - (b) **208**
 - (c) 209
 - (d) 217
20. The purchase of rice produced this period is included in GDP if the rice is
- (a) used in a meal a restaurant sells during the same period they buy the rice.
 - (b) purchased by a family who uses it to make tuna casserole for its supper.
 - (c) purchased by a frozen food company to increase its inventory.
 - (d) **B and C are correct.**
21. Suppose that over the last twenty-five years a country's nominal GDP grew to three times its former size. In the meantime, population grew by 40 percent and prices rose by 100 percent. What happened to real GDP per person?
- (a) It more than doubled.
 - (b) **It increased, but it less than doubled.**
 - (c) It was unchanged.
 - (d) It decreased.
22. During a presidential campaign, the incumbent argues that he should be reelected because nominal GDP grew by 12 percent during his 4-year term in office. You know that population grew by 4 percent over the period and that the GDP deflator increased by 6 percent during the past 4 years. You should conclude that real GDP per person
- (a) grew by more than 12 percent.
 - (b) **grew, but by less than 12 percent.**
 - (c) was unchanged.
 - (d) decreased.

23. Suppose the price index was 100 in 2014, 109 in 2015, and the inflation rate was lower between 2015 and 2016 than it was between 2014 and 2015. This means that
- (a) the price index in 2016 was lower than 109.0.
 - (b) **the price index in 2016 was lower than 118.9.**
 - (c) the price index in 2016 was lower than 118.0.
 - (d) the inflation rate between 2015 and 2016 was lower than 1.09 percent.
24. Suppose a basket of goods and services has been selected to calculate the consumer price index. In 2005, the basket of goods cost \$108.00; in 2006, it cost \$135.00; and in 2007, it cost \$168.75. Which of the following statements is correct?
- (a) Using 2005 as the base year, the economy's inflation rate was higher in 2007 than it was in 2006.
 - (b) If 2007 is the base year, then the CPI is 33.75 in 2006.
 - (c) **If the CPI is 156.25 in 2007, then 2005 is the base year.**
 - (d) Using 2005 as the base year, the economy's inflation rate for 2006 was 27 percent.
25. In 1970, Professor Plum earned \$12,000; in 1980, he earned \$24,000; and in 1990, he earned \$36,000. If the CPI was 40 in 1970, 70 in 1980, and 130 in 1990, then in real terms, Professor Plum's salary was highest in
- (a) 1970 and lowest in 1980.
 - (b) 1970 and lowest in 1990.
 - (c) 1980 and lowest in 1970.
 - (d) **1980 and lowest in 1990.**

Problem 1 (2 Points)

An American retailer purchased 100 pairs of shoes from a company in Mexico in 2016 but did not sell them to a consumer until 2017. Describe what happens to U.S. GDP in 2016 and 2017.

Let c be the cost the retailer spends to buy the 100 pairs of shoes in 2016. Let v be how much the retailer sells the shoes for in 2017. Then in 2016, inventory increases by c and NX decreases by $c \Rightarrow$ No change to 2016 GDP. In 2017, consumption increases by v , while inventory decreases by c . 2017 GDP increases by $v - c$.

Problem 2 (5 Points)

What expenditure components of Chinese GDP (if any) would each of the following transactions affect? Explain.

1. A family buys a new refrigerator. Consumption \uparrow
2. Your uncle buys a new house. Investment (residential investment) \uparrow
3. Honda China sells a car from its inventory. Consumption \uparrow Investment (inventory) \downarrow
4. The Beijing government repairs a highway. Government purchases \uparrow
5. You buy a bottle of French wine. Consumption \uparrow Net export \downarrow (import \uparrow)

Problem 3 (4 Points)

Below are the 2009 U.S. national income and expenditure data (in billions of dollars)².

Household Consumption	10,001.30
Corporate Profits	1,066.60
Investment Expenditures	1,589.20
Indirect Business Taxes	1,001.10
Depreciation	1,861.10
Government Expenditures	2,914.90
Net Foreign Factor Income	146.20
Net Exports	-386.40
Wages	7,954.70
Proprietor's Income	1,030.70
Rents	292.70
Interest Income	765.90

1. Calculate GDP using the expenditure approach. (2 Points)

$$\begin{aligned} &\text{Household consumption} + \text{Investment expenditures} + \text{Government expenditures} \\ &+ \text{Net exports} = \$14,119 \end{aligned}$$

2. Calculate GDP using the income approach. (2 Points)

$$\begin{aligned} &\text{Wages} + \text{Rents} + \text{Interest income} + \text{Corporate profits} + \text{Proprietor's income} \\ &+ \text{Indirect business taxes} + \text{Depreciation} + \text{Net foreign factor income} = \$14,119 \end{aligned}$$

²Net foreign factor income = −Net factor payment.

Problem 4 (5 Points)

The table below contains data for a country in 2015.

Household purchases of durable goods	\$1293
Household purchases of nondurable goods	\$1717
Household purchases of services	\$301
Household purchases of new housing	\$704
Purchases of capital equipment	\$310
Inventory changes	\$374
Purchases of new structures	\$611
Depreciation	\$117
Salaries of government workers	\$1422
Government expenditures on public works	\$553
Transfer payments	\$777
Foreign purchases of domestically produced goods	\$88
Domestic purchases of foreign goods	\$120

Calculate this country's 2015 GDP and its components:

1. GDP \$7253
2. Consumption Household purchases of durable goods + nondurable goods + services
= \$3311
3. Investment Household purchases of new housing + Purchases of capital equipment
+ Inventory changes + Purchases of new structures = \$1999
4. Government purchases Government expenditures on public works + Salaries of
government workers = \$1975
5. Net exports Foreign purchase of domestically produced goods - Domestic purchase
of foreign goods = -\$32

Problem 5 (4 Points)

One day, Barry the Barber, Inc., collects \$400 for haircuts. Over this day, his equipment depreciates in value by \$50. Of the remaining \$350, Barry sends \$30 to the government in sales taxes, takes home \$220 in wages³, and retains \$100 in his business to add new equipment in the future⁴. From the \$220 that Barry takes home, he pays \$70 in income taxes. Based on this information, compute Barry's contribution to the following measures of income.

1. GDP \$400
2. National income $NI = GDP - Depreciation - Sales\ taxes = \320
3. Personal income $PI = NI - Corporate\ retained\ earnings = \$220.$
4. Disposable personal income $DPI = PI - Personal\ income\ tax = \150

³i.e. Barry pays himself \$220 in wages.

⁴i.e. this \$100 is the retained earnings of the "Barry the Barber, Inc." corporation.

Problem 6 (10 Points)

Consider the following economy that produces 1 good (TV) and one service (haircut).

Year	Haircut		TV	
	price	quantity	price	quantity
2000	\$20	100	\$1000	20
2001	\$30	150	\$800	15
2002	\$35	200	\$500	10

1. Let 2000 be the base year. Calculate the CPI for each year.

CPI: 100, 86.36, 61.36

2. Calculate the nominal GDP for this economy in each year.

GDP: 22000, 16500, 12000

3. Let 2000 be the base year. Calculate the real GDP⁵ for each year.

RGDP: 22000, 18000, 14000

4. Let 2002 be the base year. Calculate the real GDP for each year.

RGDP: 13500, 12750, 12000

5. Let 2000 be the base year. Calculate the GDP deflator for each year.

GDP Deflator: 100, 91.67, 85.71

⁵In all of the following problems, the real GDP is calculated as the **fixed-weight real GDP**.

Problem 7 (4 Points)

Given the following information:

Year	Nominal GDP (in billions of dollars)	GDP Deflator (base year 2005)
2012	15,676	115.4
2002	10,642	92.2

1. What is the *annual* growth rate of nominal GDP between 2002 and 2012?

$$\left(\frac{15676}{10642}\right)^{\frac{1}{10}} - 1 = .039 = 3.9\%$$

2. What is the *annual* growth rate of real GDP between 2002 and 2012?

$$\text{Real GDP in 2002: } 10642 \times 100 / 92.2 = 11542.3$$

$$\text{Real GDP in 2012: } 15676 \times 100 / 115.4 = 13584.06$$

$$\text{Annual growth rate: } \left(\frac{13584.06}{11542.3}\right)^{\frac{1}{10}} - 1 = .016 = 1.6\%$$