

MC \_\_\_\_\_  
EXE I \_\_\_\_\_  
EXE II \_\_\_\_\_  
TOTAL \_\_\_\_\_

## Econ 002 – INTRO MACRO – Prof. Luca Bossi – February 12, 2014

### MIDTERM #1 SOLUTIONS

My signature below certifies that I have complied with the University of Pennsylvania's Code of Academic Integrity in completing this examination. In particular, I declare that I have not used a graphing calculator to complete this exam.

\_\_\_\_\_  
Student Name (printed)

\_\_\_\_\_  
PennID

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

#### INSTRUCTIONS

The exam is composed of 21 multiple choice questions and two exercises. Unless stated otherwise, all multiple choice questions are worth 3 points (the total is 60 points for the multiple choice part). The exercises are worth 20 points each (the total is 40 points for the exercise part). You can detach the answer sheet for the MC part at the end of the exam if this is more comfortable for you. If that is the case, be sure to put your name on it and to tell your TA to staple it back to the exam when finished. If you do not fill in the MC part on time and request extra time at the end of the exam to write the answers up, a proctor will take your name and you will receive a penalty of 5 points. Please follow the instructions as to how to submit your exam at the end of the 60 minutes. If you do not follow those instructions and/or delay your exam submission, a proctor will take your name and you will receive a penalty that will depend on your (miss)behavior.

**TOTAL POINTS = 100. TOTAL TIME = 60 minutes**

**Provide your answers on the exam sheet directly. Read all questions very carefully. Write legibly.**

#### EXAM TAKING POLICY

If you need to use the restroom, raise your hand and wait for the proctor to come to you. Only one person can be out of the examination room at a time, and the proctor will hold onto your exam papers while you are out at the restroom.

**FOR THE DURATION OF THE EXAM, AND WITH THE EXCEPTION OF YOUR ALLOWED SCIENTIFIC CALCULATOR, YOU HAVE TO TURN OFF EVERYTHING ELSE THAT HAS A POWER BUTTON. NO CELL PHONES. NO BOOKS. NO NOTES. NO HELP SHEETS. NO TALKING TO EACH OTHER. NO ASKING THE PROCTORS ANY QUESTION OR HELP TO SOLVE THE EXAM. YOU CANNOT CONNECT TO THE INTERNET.**

**WRITE IN PENCIL OR IN PEN AS YOU LIKE, BUT IF YOU WRITE IN PENCIL THERE IS NO POSSIBILITY TO ASK FOR RE-GRADING. PLEASE WRITE YOUR NAME ON EVERY SINGLE PAGE OF THE EXAM.**

**PLEASE DO NOT START THIS EXAM UNTIL INSTRUCTED TO DO SO.**

**GOOD LUCK!**

YOUR NAME: \_\_\_\_\_

YOUR TA's NAME: \_\_\_\_\_

### MULTIPLE CHOICE QUESTIONS

**Identify the letter that best completes the statement or answers the question. Mark your answer in the answer sheet for the MC provided on the last page of the exam.**

1) Which of the following is not correct?

- a. The consumer price index gives economists a way of turning dollar figures into meaningful measures of purchasing power.
- b. **The consumer price index is used to measure the quantity of goods and services that the economy is producing.**
- c. The consumer price index is used by economists to measure the inflation rate.
- d. The consumer price index is used to monitor changes in the cost of living over time.

2) James owns two houses. He lawfully rents one house to the Johnson family for \$10,000 per year. He lives in the other house. If he were to rent the house in which he lives, it has been estimated that he could earn \$12,000 per year in rent. How much do the housing services provided by these two houses contribute to GDP?

- a. \$0
- b. \$10,000
- c. \$12,000
- d. **\$22,000**

3) In the circular-flow diagram, which of the following items flows from firms to households through the markets for the factors of production?

- a. **wages, rent, and profit**
- b. land, labor, and capital
- c. dollars spent on goods and services
- d. goods and services

4) If net exports is a negative number for a particular year, then

- a. the value of firms' inventories declined over the course of the year.
- b. consumption exceeded the sum of investment and government purchases during the year.
- c. the value of goods sold to foreigners exceeded the value of foreign goods purchased during the year.
- d. **the value of foreign goods purchased domestically exceeded the value of goods sold to foreigners during the year.**

5) A good is produced by a firm in 2012, added to the firm's inventory in 2012, and sold to a household in 2013. As a result, on net,

- a. 2012 GDP increased and 2013 GDP decreased.
- b. **2012 GDP increased and 2013 GDP did not change.**
- c. 2012 GDP did not change and 2013 GDP increased.
- d. 2012 GDP decreased and 2013 GDP increased.

6) During the third quarter of 2006, a firm produces consumer goods and adds some of those goods to its inventory. During the fourth quarter of 2006, the firm sells the goods at a retail outlet, with the result that the value of its inventory at the end of the fourth quarter is smaller than the value of its inventory at the end of the third quarter. These actions affect which component(s) of fourth-quarter GDP?

- a. These actions affect only consumption, and they affect consumption positively.
- b. These actions affect only investment, and they affect investment positively.
- c. **These actions affect consumption positively and investment negatively.**
- d. These actions affect both consumption and investment positively.

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**7)** Consider the following three items of spending by the government: (1) the federal government pays a \$500 unemployment benefit to an unemployed person; (2) the federal government makes a \$2,000 salary payment to a Navy lieutenant; (3) the city of Bozeman, Montana makes a \$10,000 payment to ABC Lighting Company for street lights in Bozeman. Which of these payments contributes directly to government purchases in the national income accounts?

- a. only item (1)
- b. only items (2) and (3)
- c. only items (1) and (2)
- d. only item (2)

**Table 1** The table below applies to an economy with only two goods — hamburgers and hot dogs. The fixed basket consists of 4 hamburgers and 8 hot dogs.

Year	Price of hamburgers	Price of hot dogs
2009	\$5.00	\$3.00
2010	5.50	3.30
2011	5.61	3.63

**8) Refer to Table 1.** If the base year is 2009, then the economy's inflation rate is

- a. 10 percent in 2010 and 6.36 percent in 2011.
- b. 10 percent in 2010 and 17 percent in 2011.
- c. 9.2 percent in 2010 and 6 percent in 2011.
- d. 8.22 percent in 2010 and 5 percent in 2011.

**9) Refer to Table 1.** If the base year is 2010, then the consumer price index is

- a. 100 in 2009, 109 in 2010, and 115 in 2011.
- b. 95.90 in 2009, 100 in 2010, and 107.44 in 2011.
- c. 90.91 in 2009, 100 in 2010, and 106.36 in 2011.
- d. 88.82 in 2009, 100 in 2010, and 107.44 in 2011.

**10) Refer to Table 1.** If the base year is 2010, then the economy's inflation rate in 2010 is

- a. 8 percent.
- b. 10 percent.
- c. 10.91 percent.
- d. 11.11 percent.

**11)** Which of the following is *not* a reason that paying efficiency wages may increase a firm's profit?

- a. Efficiency wages decrease a country's natural rate of unemployment and therefore increase its standard of living.
- b. Efficiency wages decrease worker turnover and therefore decrease hiring and training costs.
- c. Efficiency wages decrease worker shirking and therefore increase worker productivity.
- d. Efficiency wages increase worker health and therefore increase worker productivity.

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**12)** Social Security payments are indexed for inflation using the CPI. A recent newspaper editorial claimed that Social Security recipients are harmed by years of low inflation because they do not receive as large an increase in their payments as they do in years of high inflation. Which of the following statements is correct?

- a. The newspaper editorial is correct under all circumstances.
- b. The newspaper editorial is correct if the market basket consumed by Social Security recipients is the same as the market basket used to compute the CPI.
- c. **The newspaper editorial could be correct if the prices of the goods consumed by Social Security recipients change at a different rate than the prices of the goods in the typical basket used to compute the CPI**
- d. The newspaper editorial is incorrect under all circumstances.

**13)** The citizens of country A earn \$500 million of income working abroad. Citizens of other countries earn \$200 million by working in country A. Both of these earnings are accounted for in country A's

- a. **GNP which is larger than GDP in country A.**
- b. GNP which is smaller than GDP in country A.
- c. GDP which is larger than GNP in country A.
- d. GDP which is smaller than GNP in country A.

**14)** 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, 60 in 1980, and 100 in 1990, then in real terms, Professor Plum's salary was highest in

- a. **1980 and lowest in 1970.**
- b. 1980 and lowest in 1990.
- c. 1990 and lowest in 1970.
- d. 1990 and lowest in 1980.

**15)** Which of the following statements is true?

- a. Even if we know the values of the consumer price index for the years 2009 and 2010, we cannot calculate the inflation rate for 2010 if we do not know which year is the base year.
- b. If we know the base year is 1990, and if we know the value of the consumer price index for the year 1990, then we have all the information we need to calculate the inflation rate for 2010.
- c. If we know the base year is 2000, and if we know the value of the consumer price index for the year 1995, then we have all the information we need to calculate the inflation rate for 1995.
- d. **If we know the base year is 2000, and if we know the value of the consumer price index for the year 1995, then we have all the information we need to calculate the percentage change in the cost of living between 1995 and 2000.**

**16)** If the quality of a good deteriorates while its price remains the same, then the value of a dollar

- a. rises and the cost of living increases.
- b. rises and the cost of living decreases.
- c. **falls and the cost of living increases.**
- d. falls and the cost of living decreases.

**17)** In one year, you meet 52 people who are each unemployed for one week and eight people who are each unemployed for the whole year. What percentage of the unemployment spells you encountered was short-term, and what percentage of the unemployment you encountered in a given week was long-term?

- a. 52 percent and 13.3 percent
- b. 52 percent and 88.9 percent
- c. 86.7 percent and 13.3 percent
- d. **86.7 percent and 88.9 percent**

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- 18)** The BLS classifies people who would like to work but have given up looking for a job as
- a. unemployed. If they were classified as out of the labor force, the reported unemployment rate would be larger.
  - b. unemployed. If they were classified as out of the labor force, the reported unemployment rate would be smaller.
  - c. **out of the labor force. If they were classified as unemployed, the reported unemployment rate would be larger.**
  - d. out of the labor force. If they were classified as unemployed, the reported unemployment rate would be smaller.

**19)** Shannon is a full-time homemaker not currently searching for paid work. Noah is a full-time student who is not looking for a job. Who is included in the labor force by the Bureau of Labor Statistics?

- a. only Shannon
- b. **neither Shannon nor Noah**
- c. both Shannon and Noah
- d. only Noah

**20) (2 POINTS)** According to the assigned reading I gave you: "GDP and indirect taxes"

- a.  $\text{GDP at market prices} = \text{GDP at factor costs} + \text{Subsidies} + \text{Indirect Taxes}$
- b.  $\text{GDP at market prices} = \text{GDP at factor costs} - \text{Subsidies} - \text{Indirect Taxes}$
- c.  $\text{GDP at market prices} = \text{GDP at factor costs} + \text{Subsidies} - \text{Indirect Taxes}$
- d.  **$\text{GDP at market prices} = \text{GDP at factor costs} - \text{Subsidies} + \text{Indirect Taxes}$**

**21) (1 POINT) CAREFUL!! CHOOSE THIS ONE WISELY 😊😊 (European style)**

In which year was the European Central Bank (i.e. the central bank for the euro area) formally established?

- a. 1998
- b. 2000 - 2
- c. 1000 + 998
- d. 3996/2

**EVERYONE GETS ONE POINT HERE. 😊**

YOUR NAME: \_\_\_\_\_

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**To get full credits in the exercises you really need to show your work. If you write just a number as the answer and even if that number is correct you will not get full credits in the exercise unless you show fully the formulas and your work (how you got that number and/or the reasoning involved in your computation).**

### EXERCISE I (20 points)

Use two decimals when needed in this exercise.

The economy of Naboo has a population of 10 million people, of which 7 million are in the labor force. 3 million people work in the construction sector, 2 million people work in the services sector, 1 million people work in the IT sector, and 1 million people are unemployed.

**a) (7 POINTS)** Assuming that the fraction of unemployed construction workers with respect to total number of unemployed people is the same as the fraction of employed construction workers with respect to the total population; and the fraction of unemployed service workers with respect to total number of unemployed people is the same as the fraction of employed service workers with respect to the total population, how many construction workers are unemployed? How many service sector workers?

**b) (8 POINTS)** Calculate the unemployment rate for the construction sector in Naboo. Calculate the unemployment rate for the service sector in Naboo.

**c) (5 POINTS)** Suppose that the construction sector faces reduced demand, and is forced to lay off 2 million workers. 1.5 million of them stay in the labor force, while .5 million, discouraged by the layoffs, exit the labor force. Calculate the unemployment rate in Naboo .

### PAPER FOR YOUR USE

#### Answers

**a) Fraction of employed construction workers with respect to the total population =  $(3/10)*100 = 30\%$**

**Fraction of employed service workers with respect to the total population =  $(2/10)*100 = 20\%$**

**Hence 20% of 1 million = 200,000 are the unemployed service workers.**

**And 30% of 1 million = 300,000 are the unemployed construction workers**

**b) For service workers: there are 200,000 unemployed**

**The labor force in the service sector is  $200,000 + 2\text{mil} = 2.2\text{ mil}$**

**Unemployment rate for service workers =  $200,000/2,200,000*100 = 9.09\%$**

**For construction workers there are 300,000 unemployed**

**The labor force in the construction sector is:**

**$300,000 + 3\text{mil} = 3.3\text{mil}$**

**$(300,000/3,300,000)*100 = 9.09\%$**

**c) # of Unemployed =  $(1+2-.5)$**

**Labor Force =  $(7-.5)$**

**Unemployment rate =  $((1+2-.5)/(7-.5))*100 = 38.5\%$**

YOUR NAME: \_\_\_\_\_

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**EXERCISE II (20 points total)**

Use two decimals when needed in this exercise.

The table below displays the information about all goods and services produced in **HULK**land in various years. The Ipad Mini is a new good introduced in 2012 so prices and quantities for Ipad Mini are not available (NA) for 2010 and 2011.

Years	Ice Cream		Kiwis		Ipad Mini	
	Price	Quantity	Price	Quantity	Price	Quantity
2010	4.25	3,000	1.25	1,000	NA	NA
2011	4.50	3,200	1.50	1,200	NA	NA
2012	5.00	4,000	2.00	1,500	500	100

a) (6 POINTS) Compute the Nominal GDP for each year.

b) (4 POINTS) Write down the 6 steps that are needed to compute the RGDP with the chain weighted method.

c) (10 POINTS) Using the chain weighted GDP method, compute the Real GDP for each year using 2010 as the base year.

**PAPER FOR YOUR USE**

**Answers**

a)

$$\text{NGDP for 2010} = \$4.25 * 3,000 + \$1.25 * 1,000 = \$14,000$$

$$\text{NGDP for 2011} = \$4.5 * 3,200 + \$1.5 * 1,200 = \$16,200$$

$$\text{NGDP for 2012} = \$5 * 4,000 + \$2 * 1,500 + 500 * 100 = \$73,000$$

b) and c) Need to use chain weighted method: this method is composed of 6 steps.

**STEP 1**

**Calculate real GDP growth for an adjacent pair of years choosing one of the years as a base year.**

RGDP for 2010 (base year 2010) =  $\$4.25 * 3,000 + \$1.25 * 1,000 = \$14,000$  (this is also NGDP for 2010 so you could have skipped this computation and report just the number from part a) above)

$$\text{RGDP for 2011 (base year 2010)} = \$4.25 * 3,200 + \$1.25 * 1,200 = \$15,100$$

$$\text{RGDP growth} = 100 * (\text{new-old}) / \text{old} = 7.86\%$$

**STEP 2**

**Calculate RGDP growth between the same pair of years using the other year as a base year.**

$$\text{RGDP for 2010 (base year 2011)} = \$4.5 * 3,000 + \$1.5 * 1,000 = \$15,000$$

RGDP for 2011 (base year 2011) =  $\$4.5 * 3,200 + \$1.5 * 1,200 = \$16,200$  (this is also NGDP for 2011 so you could have skipped this computation and report just the number from part a) above)

$$\text{RGDP growth} = 100 * (\text{new-old}) / \text{old} = 8\%$$

YOUR NAME: \_\_\_\_\_

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### STEP 3

Average the two numbers and obtain the growth rate between the two years  
(this avoids any arbitrariness in the choice of the base year)

$$\text{Average growth rate} = (7.86+8)/2 = 7.93\%$$

### STEP 4

Repeat steps (1) to (3) for every pair of adjoining years. The end results is to produce a table of growth rates for the economy.

$$\text{RGDP for 2011 (base year 2011)} = \$16,200$$

$$\text{RGDP for 2012 (base year 2011)} = \$4.5 * 34,000 + \$1.5 * 1,500 = \$20,250$$

$$\text{RGDP growth} = 100 * (\text{new-old}) / \text{old} = 25\%$$

$$\text{RGDP for 2011 (base year 2012)} = \$5 * 3,200 + \$2 * 1,200 = \$18,400$$

$$\text{RGDP for 2012 (base year 2012)} = \$5 * 4,000 + \$2 * 1,500 + \$500 * 100 = \$73,000 \text{ (this is also NGDP for 2012 so you could have skipped this computation and report just the number from part a) above)}$$

$$\text{RGDP growth} = 100 * (\text{new-old}) / \text{old} = 296.74\%$$

$$\text{Avg. growth rate} = (25+296.74)/2 = 160.87\%$$

years	AVG RGDP GROWTH
2010	NA
2011	7.93%
2012	160.87%

### STEP 5

Figure out the base year you need to use. In this case the exercise says that the base year is 2010. In this year we know that NGDP = RGDP

$$\text{RGDP for 2010} = \text{NGDP for 2010} = 14,000$$

### STEP 6

Obtain the RGDP for the other years in your time series just applying appropriately the growth rates of RGDP obtained in the table of step 4.

year	RGDP	
2010	14,000	
2011	15,110	$= (1+7.93\%) * 14,000$
2012	39,417.39	$= (1+160.87\%) * 15,110$



YOUR NAME: \_\_\_\_\_

YOUR TA's NAME: \_\_\_\_\_

**MARK CLEARLY THE LETTER OF YOUR CHOICE FOR THE MULTIPLE CHOICE QUESTIONS  
ONLY THIS PAGE WILL BE GRADED FOR THE MC PART.**

- |     |     |     |     |     |
|-----|-----|-----|-----|-----|
| 1.  | (A) | (B) | (C) | (D) |
| 2.  | (A) | (B) | (C) | (D) |
| 3.  | (A) | (B) | (C) | (D) |
| 4.  | (A) | (B) | (C) | (D) |
| 5.  | (A) | (B) | (C) | (D) |
| 6.  | (A) | (B) | (C) | (D) |
| 7.  | (A) | (B) | (C) | (D) |
| 8.  | (A) | (B) | (C) | (D) |
| 9.  | (A) | (B) | (C) | (D) |
| 10. | (A) | (B) | (C) | (D) |
| 11. | (A) | (B) | (C) | (D) |
| 12. | (A) | (B) | (C) | (D) |
| 13. | (A) | (B) | (C) | (D) |
| 14. | (A) | (B) | (C) | (D) |
| 15. | (A) | (B) | (C) | (D) |
| 16. | (A) | (B) | (C) | (D) |
| 17. | (A) | (B) | (C) | (D) |
| 18. | (A) | (B) | (C) | (D) |
| 19. | (A) | (B) | (C) | (D) |
| 20. | (A) | (B) | (C) | (D) |
| 21. | (A) | (B) | (C) | (D) |