Econ 002 – INTRO MACRO – Prof. Luca Bossi – September 30, 2013
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.

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 FOLLOW THE INSTRUCTIONS AS TO HOW TO SUBMIT YOUR EXAM AT THE END OF THE 60 MINUTES.

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 of the choice that best completes the statement or answers the question. Write your answer in the answer page for the MC provided on the last sheet of the exam.

1) 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.

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) The scientific method is applicable to studying
a.   natural sciences, but not social sciences.
b.   social sciences, but not natural sciences.
c.   both natural sciences and social sciences.
d.   None of the above is correct.

4) Meredith recently graduated from college but has not yet started working. To be counted as unemployed she
a.   does not have to have looked for work.
b.   must have looked for work no more than a week ago.
c.   must have looked for work within the past 4 weeks.
d.   must have looked for work no more than 12 weeks ago.

5) Over time, people have come to rely more on market-produced goods and services and less on goods and services they produce for themselves. For example, busy people with high incomes, rather than cleaning their own houses, hire people to clean their houses. By itself, this change has
a.   caused measured GDP to fall.
b.   not caused any change in measured GDP.
c.   caused measured GDP to rise.
d.   probably changed measured GDP, but in an uncertain direction; the direction of the change depends on the difference in the quality of the cleaning that has resulted.

6) President Truman once said the wanted to find a one-armed economist because when he asked his economists for advice, they always answered, "On the one hand, ... On the other hand, ..." Truman's observation that economists' advice is not always straightforward
a.   is rooted in the principle that people face tradeoffs.
b.   indicates that economists recognize that there are opportunity costs associated with policy decisions.
c.   confirms that economists are not suited to be presidential advisers.
d.   More than one of the above is correct.

7) A good is produced by a firm in 2010, added to the firm's inventory in 2010, and sold to a household in 2011. It follows that

a.   the value of the good is added to the investment category of 2010 GDP, added to the consumption category of 2011 GDP, and subtracted from the investment category of 2011 GDP.

b.   the value of the good is added to the investment category of 2010 GDP, added to the consumption category of 2011 GDP, and not included in the investment category of 2011 GDP.

c.   the value of the good is added to the investment category of 2010 GDP, subtracted from the consumption category of 2011 GDP, and not included in the investment category of 2011 GDP.

d.   the value of the good is added to the investment category of 2010 GDP, subtracted from the consumption category of 2011 GDP, and added to the investment category of 2011 GDP.

8) Suppose that an economy produces 40,000 units of good A which sells at $4 a unit and 20,000 units of good B which sells at $5 per unit.   Production of good A contributes

a.   2 times as much to GDP as the production of good B.

b.   8/5 times as much to GDP as the production of good B.

c.   5/4 times as much to GDP as the production of good B.

d.   4/5 times as much to GDP as production of good B.

9) The second largest category, by relative importance, in the CPI basket calculation is

a.   housing.

b.   apparel.

c.   transportation.

d.   medical care.

10) A country's real GDP rose from 500 to 550 while its nominal GDP rose from 600 to 770. What was this country's inflation rate?

a.   16.7%

b.   20%

c.   -14.3%

d.   -20%

11) The GDP deflator for years subsequent to the base year measures the change in

a.   nominal GDP from the base year that cannot be attributable to a change in real GDP.

b.   real GDP from the base year that cannot be attributable to a change in nominal GDP.

c.   nominal GDP from the base year that cannot be attributable to a change in prices.

d.   real GDP from the base year that cannot be attributable to a change in prices.

12) If total spending rises from one year to the next, then which of the following could not be true?

a.   the economy is producing a smaller output of goods and services, and goods and services are selling at higher prices

b.   the economy is producing a larger output of goods and services, and goods and services are selling at lower prices

c.   the economy is producing a larger output of goods and services, and goods and services are selling at higher prices

d.   the economy is producing a smaller output of goods and services, and goods and services are selling at lower prices

13) 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 monitor changes in the cost of living over time.
c. The consumer price index is used by economists to measure the inflation rate.
d. The consumer price index is used to measure the quantity of goods and services that the economy is producing.

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 2010, 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

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.   only Noah
c.   both Shannon and Noah
d.   neither Shannon nor Noah

20) (2 POINTS) According to the assigned reading I gave you: "The Lady Gaga Fix: How the U.S. Is Rethinking GDP for the 21st Century", the BEA will start to incorporate into GDP:
a.   all the creative, innovative work that is the backbone of much of what the United States now produces.
b.   Not all the creative, but just the innovative work that is the backbone of much of what the United States now produces.
c.   all the creative, but not the innovative work that is the backbone of much of what the United States now produces.
d.   All of the above are correct.

21) (1 POINT) CAREFUL!! CHOOSE THIS ONE WISELY ☺☺ **(Federal reserve style)**
In which year was the Federal Reserve (i.e. the US central bank) established?
a.   1913
b.   1900 + 13
c.   13 +1900
d.   3826/2
EVERYONE GETS ONE POINT HERE. ☺

To get full credits in the exercises below 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 the reasoning involved in your computation).

EXERCISE I (20 points)

The table below gives information about the Black Mamba (BM) economy for the period 2009-2012. Let 2012 be the base year. Use 2 decimals (rounding to the nearest one) whenever necessary in the computations.

	Ice Creams – produced domestically		Kiwis – imported	
Year	P	Q (in thousands)	P	Q (in thousands)
2009	$3.5	3	$1	1.5
2010	$4.25	3	$1.25	1
2011	$4.5	3.2	$1.5	1.2
2012	$5	4	$2	1.5

	Tractors – produced domestically		Ipad Mini – produced domestically	
Year	P	Q (**not** in thousands)	P	Q (in thousands)
2009	$10,000	150	-	-
2010	$12,000	250	-	-
2011	$13,000	300	-	-
2012	$15,000	330	$500	20

a) (7 points) For each year compute the inflation rate using the GDP Deflator.

b) (6 points) In the typical market basket there are two units of each relevant consumption good displayed above that is available in 2009. For each year compute the inflation rate using the CPI.

c) (7 points) For each year compute the inflation rate using the Personal Consumption Expenditure Deflator.

Answers:
a. To find the GDPD you need first to compute the RGDP and the NGDP for each year (with the exception of 2012). NGDP and RGDP consist of Ice Creams, Tractors and Ipad Mini because they are produced domestically. Kiwis are imported, so they do not affect the computations for GDP.

To compute the GDPD for 2012 you can use the shortcut that since 2012 is the base year, NGDP$_{2012}$= RGDP$_{2012}$ so GDPD$_{2012}$ = 100.
This facilitates the computations for this part as you do not even need to worry about Ipad Mini price and quantities (that show up in 2012 but for which you have the GDPD figure already).
Lastly, another shortcut you could have used is to think for a second about this: all the quantities for all goods except tractors are expressed in thousands. But the prices of tractors are expressed in thousands while the other commodity prices are not; so you just express the price and quantities without thousands

and everything will work out egregiously. For RGDP you need to use 2012 prices because 2012 is the base year.

Years	NGDP (in thousands $)	RGDP (in thousands $)
2009	3.5x3+10x150 = 1,510.5	5x3+15x150=2,265
2010	4.25x3 + 12x250 = 3,012.75	5x3 + 15x250 = 3,765
2011	4.5x3.2 + 13x300 = 3,914.4	5x3.2 + 15x300 = 4,516
2012	5x4+15x330+500*20=14,970	14,970 (same as NGDP)

Recall that:

$GDPD_t = 100 \times NGDP_t/RGDP_t$

Inflation in period t = $100*(GDPD_t - GDPD_{t-1})/ GDPD_{t-1}$

Using the info in the previous table we get:

Years	GDPD	Inflation (%)
2009	100x1,510.5/2,265 = 66.69	NA
2010	100x3,012.75/3,765 = 80.02	19.99
2011	100x3,914.4/4,516 = 86.68	8.32
2012	100	15.37

b. Here you need to take into consideration 3 things:

1) Tractors are not included in the CPI because they are not consumption goods and certainly not in the typical market basket.

2) Ipad Minis are not available in 2009 so they do not enter CPI.

3) Base Period is 2012

So you need to keep track only of Ice Creams and Kiwis. Each good is represented by 2 units and you can now compute the basket cost.

$CPI_t = 100xBK_t/BK_{BP}$

Inflation in period t = $100*(CPI_t - CPI_{t-1})/ CPI_{t-1}$

Years	Basket Cost (BK)	CPI	Inflation (%)
2009	3.5x2+1x2 = 9	64.29	NA
2010	4.25x2 + 1.25x2 = 11	78.57	22.22
2011	4.5x2 + 1.5x2 = 12	85.71	9.09
2012	5x2+2x2 = 14	100	16.67

c. Here, to compute RPCE and NPCE for each period, you need to take into account 3 things:

1) Tractors will not be included in PCED because they are not consumption goods.

2) All other goods that are consumed (Ice Creams, Kiwis, Ipad Minis) need to be included (when available). In particular, Kiwis are included in Consumption because if they are imported, someone in the economy is consuming them.
3) Base year is 2012.

Years	NPCE (in thousands $)	RPCE (in thousands $)
2009	3.5x3+1x1.5 = 12	5x3+2x1.5 = 18
2010	4.25x3+1.25x1 = 14	5x3+2x2 = 17
2011	4.5x3.2+1.5x1.2 = 16.2	5x3.2+2x1.2 = 18.4
2012	5x4+2x1.5+500x20 =10,023	10,023

Now recall that:

$PCED_t = 100 \times NPCE_t/RPCE_t$

Inflation in period t = $100*(PCED_t - PCED_{t-1})/ PCED_{t-1}$

Years	PCED	Inflation (%)
2009	66.67	NA
2010	82.35	23.53
2011	88.04	6.91
2012	100	13.58

PAPER FOR YOUR USE

EXERCISE II (20 points)
Given below is some information about the economy of Peytonland. Round always to the nearest decimal for figures concerning the Adult population, Total Employed and Total Unemployed. Round to two decimals for percentage figures.

Year	Adult population	Total Employed	Total Unemployed	Labor Force Participation Rate	Unemployment Rate
2010	60million	50million	2million		
2011	63million		1million		1.96%
2012	66million	50million		80%	

a) (9 points) Fill in the missing information and please show your work.
b) (11 points) The census of Peytonland provides you with some new information concerning its economy. For each year displayed in the table above, half or the adult population is in the age group of 16-35. One third of the adult population is in the age group 36-50. Also, for each year displayed above, two thirds of the total unemployed belong to the age group 16-35 and one tenth to the age group 36-50. If for each age group the people that are outside the labor force in each year are 5% of the total people employed for that year, what is the labor force participation rate and the unemployment rate for each age group in year 2010 and in year 2011? (**Hint:** to make life easier for yourself, write down the relationship outlined above between each variable using simple formulas and then solve).

Answers:
a)

Year	Adult population	Total Employed	Total Unemployed	LFPR	Unemployment Rate
2010	60million	50million	2million	**86.67%**	**3.84%**
2011	63million	**50million**	1million	**80.95%**	1.96%
2012	66million	50million	**2.8million**	80%	**5.3%**

Formulas used here are:
1. **Labor Force= Total Employed+ Total unemployed**
2. **LFPR= (Labor Force/Adult population)*100**
3. **Unemployment Rate= (Total Unemployed/Labor Force)*100**

b) We know that for each year:
Adult population Age 16-35 = 0.5 x Adult Population
Adult population Age 36-50 = (1/3) x Adult population
Unemployed Age 16-35 = (2/3) x total unemployed
Unemployed Age 36-50 = (1/10) x total unemployed
Not in LF (for each group) = 0.05 x total employed
We can then formulate the following table:

Year	Adult population Age 16-35	Adult population Age 36-50	Unemployed Age 16-35	Unemployed Age 36-50	Not in LF Age 16-35	Not in LF Age 36-50
2010	**30million**	**20million**	**(4/3)million**	**0.2million**	**2.5mil**	**2.5mil**
2011	**31.5million**	**21million**	**(2/3)million**	**0.1million**	**2.5mil**	**2.5mil**

Now:
To find the LF we need to remove those outside of the LF from the total population (for each age group).
To find the UR for each age group we need to divide the total unemployed in that group by the LF of that group.
To find the LFPR for each age group we take the LF of that age group/Adult population of that age group.

Year	LF Age 16-35	LF Age 36-50	UR Age 16-35	UR Age 36-50	LFPR Age 16-35	LFPR Age 36-50
2010	**27.5million**	**17.5million**	**4.85%**	**1.14%**	**91.66%**	**87.5%**
2011	**29million**	**18.5million**	**2.30%**	**0.54%**	**92.06%**	**88.09%**

PAPER FOR YOUR USE

YOUR NAME: _____

YOUR TA's NAME:_____

ANSWER PAGE FOR MC
WRITE THE LETTER OF YOUR CHOICE FOR THE MULTIPLE CHOICE QUESTIONS HERE;
ONLY THIS PAGE WILL BE GRADED FOR THE MC PART.

1)	6)	11)	16)
2)	7)	12)	17)
3)	8)	13)	18)
4)	9)	14)	19)
5)	10)	15)	20)
			21)