ECON 10020/20020
Principles of Macroeconomics

Problem Set 2

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General Instructions

1. Due: Tuesday 10$^{\text{th}}$ February 2015 by 3:45 p.m.

2. Read and follow all instructions/directions carefully. An inability to follow instructions/directions will result in points being deducted.

3. All problems sets submitted must be stapled, handwritten, and include the cover page.

4. Only problem sets submitted in person and/or in class will be accepted.

5. Answer all questions in blue or black ink only; i.e., no pencils or colored inks. The only exception: graphs may be drawn in pencil. Note: use a guide of some sort (e.g., a ruler) for all graphs. Do not use white out or similar products, but neatly cross/scratch out any mistakes.

6. Write, mark, and draw your answers neatly and clearly. If your answer is illegible (i.e., difficult to read in the least), then it will not be graded. It is your job to clearly communicate.

7. Label all graphs fully and completely; i.e., axes, intersections, curves, etc.

8. Support your answers as thoroughly as possible; i.e., graphically, conceptually, and mathematically. Note: this may not be feasible or necessary for all questions asked. State and define any concept utilized and list and name any equation used. In other words, show all of your work.

9. Do not copy from another student.

10. Note: only use materials from this class, listed textbooks, and suggested resources to answer questions. The Google can be quite useful and tempting, but very often a question has been constructed in a very specific manner; i.e., using a certain set of assumptions. Another source may have a very similar problem, but with slightly different underlying assumptions that change the answer completely. This is typically not obvious and will likely leave you very confused.

11. For the True/False/Uncertain questions clearly indicate your choice by writing either "True", "False", or "Uncertain" underneath the respective question. Unless explicitly instructed otherwise, all true/false/uncertain questions require a justification to receive credit.

12. For the multiple choice questions, choose the "best" answer and mark the letter in the spaces provided at the bottom of the page. Only clearly written letters in the allocated space will be graded.

Original Score (%)	
Adjustment (%)	
Actual Score (%)	

1. Which of the following would be directly counted in GDP in 2014?

    (A) kitchen cabinets purchased from Home Depot in 2014 to be installed in a house built in 1997 ✓ A

    (B) kitchen cabinets built in 1887, extracted from the 1887 home, and installed in a brand new country-style home

    (C) kitchen cabinets built in 1887, extracted from the 1887 home, and installed in a farm house built in 1950

    (D) none of the above

2. The nominal GDP of the U.S. in 2012 was approximately $16.2 trillion. This means that

    (A) the value of output in 2012 was around $16.2 trillion.

    (B) total income in 2012 was around $16.2 trillion.

    (C) total spending in 2012 was around $16.2 trillion.

    (D) all of the above are true. ✓ D

3. Investment, as defined by economists, would not include which of the following? Ford

    (A) buys a new robotic machine (from a plant in Ohio) to assemble cars.

    (B) adds 1,000 new cars to inventories.

    (C) builds another assembly plant in the United States.

    (D) buys U.S. government bonds. ✓ D

4. In 2013, Kendall Ford, an automobile dealership, spent $20,000 on a new car lift for its repair shop, $2,000 on a new copy machine for its sales division, and $600,000 on Ford Motor company stock. Unsold cars and trucks were valued at $400,000 on January 1, 2013 and unsold cars and trucks were valued at $900,000 on December 31, 2013. What is Kendall Ford's total investment spending in 2013?

    (A) $22,000

    (B) $322,000

    (C) $522,000 ✓ C

    (D) $1,022,000

5. Between 2013 and 2014, if an economy's exports rise by $8 billion and its imports fall by $8 billion, by how much will GDP change between the two years, all else equal?

    (A) Net exports will increase GDP by $8 billion.

    (B) The increase in exports is offset by the decrease in imports, so there is no change in net exports and no effect on GDP.

    (C) Net exports will increase GDP by $16 billion. ✓ C

    (D) Net exports will decrease GDP by $8 billion.

1. A   2. D   3. D   4. C   5. C

6. The Philippines and Vietnam have roughly the same size population. Suppose the GDP of the Philippines is $1,000 billion and the GDP of Vietnam is $10,000 billion. You should conclude

   (A) a typical person in Vietnam is 10 times as well off as the typical person in the Philippines.
   (B) a typical person in Vietnam is more than 10 times as well off as the typical person in the Philippines.
   (C) a typical person in Vietnam is less than 10 times as well off as the typical person in the Philippines.
   (D) it is not possible to make a good comparison of the economic well being of a typical individual in the 2 countries without additional information. ✓ D

7. The size of the underground economy would tend to decrease if the government of a country

   (A) decreased government regulations on businesses. ✓ A
   (B) made over-the-counter drugs illegal.
   (C) increased income tax rates.
   (D) increased business taxes.

8. If China decides to enact laws to clean up the environment, what would be the effect on GDP?

   (A) GDP would increase reflecting the fact that the environment would be cleaner.
   (B) GDP would decrease if the pollution controls reduce productivity by more than the cost of the controls. ✓ B
   (C) GDP would increase as the citizens of China were made happier as the environment was cleaned up.
   (D) GDP would increase as the environmental costs of pollution were not included in the calculation of GDP.

9. Which of the following could cause nominal GDP to increase, but real GDP to decrease?

   (A) The price level rises and the quantity of final goods and services produced rises.
   (B) The price level rises and the quantity of final goods and services produced falls. ✓ B
   (C) The price level falls and the quantity of final goods and services produced rises.
   (D) The price level falls and the quantity of final goods and services produced falls.

10. The output of U.S. citizens who work in Canada would be included in the

   (A) gross domestic product of Canada. ✓ A
   (B) gross national product of Canada.
   (C) gross domestic product of the United States.
   (D) gross national product of Canada and the gross national product of the United States.

6. D　　　　　　　7. A　　　　　　　8. B　　　　　　　9. B　　　　　　　10. A

Table 1: For Multiple Choice Questions 11–15

| | 2008 | | 2013 | |
Product	Quantity	Price	Quantity	Price
Camera	100	$10	120	$12
Legal services	50	$15	45	$20
Books	200	$40	210	$45

A very simple economy produces three goods: cameras, legal services, and books. The quantities produced and their corresponding prices for 2008 and 2013 are shown in the table above.

11. Refer to Table 1. What is real GDP in 2013, using 2013 as the base year?

(A) $28,885

(B) $11,790 ✓ B

(C) $11,200

(D) $10,275

12. Refer to Table 1. What is nominal GDP in 2013 when 2008 is the base year?

(A) $28,885

(B) $11,790 ✓ B

(C) $11,200

(D) $10,275

13. Refer to Table 1. What is the GDP deflator in 2013 if 2013 is the base year?

(A) 120

(B) 118

(C) 100 ✓ C

(D) 87

14. Refer to Table 1. What is the GDP deflator in 2008 if 2013 is the base year?

(A) 187

(B) 87 ✓ B

(C) 8.7

(D) 0.87

15. Refer to Table 1. What is real GDP in 2013, using 2008 as the base year?

(A) $28,885

(B) $11,790

(C) $11,200

(D) $10,275 ✓ D

11. B   12. B   13. C   14. B   15. D

	Table 2: For Multiple Choice Questions 19–21	
Year	Nominal Average Hourly Earnings	CPI (1982–1984 = 100)
1965	$2.65	32
2010	$22.59	219

The table above reports the nominal average hourly earnings in private industry and the consumer price index for 1965 and 2010.

16. Refer to Table 2. The real average hourly earnings for 1965 in 1982–1984 dollars equal

    (A) $1.28.
    (B) $6.49.
    (C) $8.28. ✓ C
    (D) $15.45.

17. Refer to Table 2. The percentage change in real average earnings from 1965 to 2010 equals

    (A) 2.0 percent.
    (B) 19.7 percent.
    (C) 24.5 percent. ✓ C
    (D) 80.3 percent.

18. Refer to Table 2. The real average hourly earnings for 1965 in 2010 dollars equal

    (A) $3.87.
    (B) $5.80.
    (C) $12.10.
    (D) $18.14. ✓ D

19. If the price level rose in three consecutive years from 100 to 120 to 140, then the annual inflation rate over those years would

    (A) increase.
    (B) remain the same.
    (C) decrease. ✓ C
    (D) equal 20%.

20. The "new product bias" in the consumer price index refers to the idea that

    (A) consumers switch to new goods when the prices of old goods increase, and the CPI overestimates the cost to consumers.
    (B) consumers switch to old goods when the prices of new goods increase, and the CPI underestimates the cost to consumers.
    (C) consumers prefer new goods, even if they are worse in quality than old goods, and this causes the CPI to underestimate the cost to consumers.
    (D) new products' prices often decrease after their initial introduction, and the CPI is adjusted infrequently and overestimates the cost to consumers. ✓ D

16. C   17. C   18. D   19. C   20. D

$$\text{real average hourly earnings } t = \text{nominal average hourly earnings } t \left(\frac{\text{CPI}_{1982-1984}}{\text{CPI}_{\text{period } t}} \right)$$

$$\text{real average hourly earnings } 1965 = \$2.65 \left(\frac{100}{32} \right)$$

$$\text{real average hourly earnings } 1965 = \$8.28$$

$$\text{real average hourly earnings } t = \text{nominal average hourly earnings } t \left(\frac{\text{CPI}_{1982-1984}}{\text{CPI}_{\text{period } t}} \right)$$

$$\text{real average hourly earnings } 2010 = \$22.59 \left(\frac{100}{219} \right)$$

$$\text{real average hourly earnings } 1965 = \$10.32$$

$$\begin{aligned} \%\Delta_{1965-2010} &= \frac{\$10.32 - \$8.28}{\$8.28} \times 100\% \\ &= 24.64\% \text{ (Note: difference due to rounding)} \end{aligned}$$

$$\text{real average hourly earnings } t = \text{nominal average hourly earnings } t \left(\frac{\text{CPI}_{2010}}{\text{CPI}_{\text{period } t}} \right)$$

$$\text{real average hourly earnings } 1965 = \$2.65 \left(\frac{219}{32} \right)$$

$$\text{real average hourly earnings } 1965 = \$18.14$$

21. Which of the following would be a consequence of substitution bias in the CPI?

    (A) Social Security payments would not adequately compensate retired workers for inflation.

    (B) Businesses would over-compensate employees for inflation when giving the cost of living rises. ✓ B

    (C) The inflation rate based on the CPI would under-estimate the true level of inflation.

    (D) Judges would award child support payments that would not adequately keep up with the true cost of inflation.

22. The stated interest rate on a loan is the

    (A) real interest rate.

    (B) nominal interest rate. ✓ B

    (C) actual inflation rate.

    (D) expected inflation rate.

23. During a deflationary period,

    (A) the nominal interest rate is less than the real interest rate. ✓ A

    (B) the real interest rate is less than the nominal interest rate.

    (C) the price level rises.

    (D) the nominal interest rate does not change.

24. You borrow $10,000 from a bank for one year at a nominal interest rate of 5%. The CPI over that year rises from 180 to 200. What is the real interest rate you are paying?

    (A) 15%

    (B) 5%

    (C) −1.1%

    (D) −6.1% ✓ D

25. Which of the following is not an example of inflation causing a redistribution of income because the inflation was unanticipated?

    (A) A firm signs a 3-year contract with a union based on a 2 percent anticipated rate of inflation per year, and the actual rate of inflation ends up being 7 percent per year.

    (B) A worker receives a raise in salary that is less than the rate of inflation, because management under-predicted inflation.

    (C) Firms have to hire an extra worker to change prices in its store because of inflation. ✓ C

    (D) A bank collects a lower amount of interest from a loan because inflation was under-predicted.

21. B   22. B   23. A   24. D   25. C

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26. Which of the following individuals would be most negatively affected by anticipated inflation?

    (A) a retired railroad engineer who receives a fixed income payment every month ✓ A

    (B) a union contractor whose pay is adjusted based on changes in the CPI

    (C) a full-time employee at a pizza parlor who makes more than the minimum wage

    (D) a student who borrows $10,000 at a nominal interest rate of 5% to finance educational expenses

27. If your nominal wage rises faster than the price level, we can say your real wage has _____ and the purchasing power of your income has _____ .

    (A) fallen; fallen

    (B) fallen; risen

    (C) risen; risen ✓ C

    (D) risen; fallen

28. When an economy is at its natural rate of unemployment, which of the following will be true?

    (A) The unemployment rate will be 0%.

    (B) The labor force participation rate will be 100%.

    (C) The unemployment rate will be greater than 0%. ✓ C

    (D) Only structural unemployment as a result of technological change will exist in the economy.

29. In 2013, Caterpillar laid off employees who produced mining machinery at its South Milwaukee plant. The laid-off employees who were not able to find jobs at another factory due to a permanent decline in demand in the mining industry would be considered

    (A) structurally unemployed. ✓ A

    (B) frictionally unemployed.

    (C) seasonally unemployed.

    (D) cyclically unemployed.

30. An increase in unemployment insurance payments would, in effect, _____ the amount of time spent searching for a job, which would increase _____ unemployment.

    (A) increase; cyclical

    (B) increase; frictional ✓ B

    (C) decrease; cyclical

    (D) decrease; frictional

26. A   27. C   28. C   29. A   30. B

31. Which of the following cause the unemployment rate as measured by the Bureau of Labor Statistics to understate the true extent of joblessness?

    (A) inflation

    (B) discouraged workers ✓ B

    (C) people employed in the underground economy

    (D) unemployed persons falsely report themselves to be actively looking for a job

32. If the number of unemployed workers is 19 million, the number in the working-age population is 500 million, and the unemployment rate is 4%, what is the labor force participation rate?

    (A) 4.75%

    (B) 7.8%

    (C) 95% ✓ C

    (D) 96.2%

33. If the number of unemployed workers is 19 million, the number in the working-age population is 500 million, and the unemployment rate is 4%, how many workers are in the labor force?

    (A) 1 million

    (B) 20 million

    (C) 475 million ✓ C

    (D) 481 million

34. If the number of unemployed workers is 200 million, and the number in the labor force is 500 million, what is the unemployment rate?

    (A) 0.4%

    (B) 4%

    (C) 14%

    (D) 40% ✓ D

35. Suppose that homemakers are included as employed in the labor force statistics, rather than being counted as out of the labor force. This would

    (A) increase the measured unemployment rate.

    (B) increase the measured labor force participation rate. ✓ B

    (C) decrease the number of persons in the labor force.

    (D) decrease the number of persons in the working-age population.

31. B   32. C   33. C   34. D   35. B

36. According to the Bureau of Labor Statistics (BLS) the U.S. unemployment rate (U-3) peaked in October 2009 reaching 10.0%. This figure has since slowly and consistently declined to its current level of 7.3% (August 2013).

   (a) [**8 points**] This prompted a U.S. Senator to state in *The New York Times* "this [decrease in unemployment] clearly shows America is in the process of fully recovering from the Great Recession". Do you agree or disagree with this statement? Carefully explain your positive economic reasoning.

   - Whether agree or disagree is arbitrary.
   - List either:
     - Discouraged workers: People who are available for work, but have not looked for a job during the previous four weeks because they believe no jobs are available for them.
     - Underemployment (unemployment intensity): A situation in which a worker is employed, but not in the desired capacity, whether in terms of compensation, hours, or level of skill and experience.
     - Additionally:
       * distribution of unemployment
       * Unemployment duration – long periods of unemployment are bad for workers, as their skills may atrophy thereby making it more difficult to find work. They increase the risk of becoming discouraged and depressed. Additionally, may push workers into jobs they wouldn't normally take with a healthy economy; e.g., someone with an advanced degree working at McDonalds (a form of underemployment).
   - Provide an explanation as to how at least one of these criticisms concerning the unemployment rate (i.e., discourage workers and underemployment) would artificially lower the "actual" unemployment rate.
     - Either reference the unemployment rate equation or give an artificial numerical example demonstrating how underemployment and/or discouraged workers may artificially reduce the "real" unemployment rate.
   - IF . . .
     - . . . stated that unemployment isn't the only measure for the health of the economy; e.g., inflation/deflation.
       * This is by no means wrong, but misses the focus of the question: unemployment.
     - . . . agreed and supported your answer by connecting to the phases of the business cycle (e.g., recession) and types of unemployment (e.g., cyclical unemployment), then some credit is awarded.
   - Note: a critical and careful examination of the readings and questions are important. However, this class is NOT concerned with postmodern deconstructionist analysis. Words like "clearly" and "fully" can give a hook, so to speak, to latch onto and attack, but the focus of your analysis should be on applying positive economic reasoning.

   (b) [**6 points**] Although the unemployment rate has persistently decreased since October 2009 the current unemployment rate is still above the estimated natural rate of unemployment. Noting this, a commentator in *Forbes* stated "the Obama administration's efforts to reduce unemployment have failed". Is there a potential economic (logical) fallacy in this statement? If so, identify the economic fallacy and briefly explain why the commentator's statement can be classified as the logical fallacy you identified.

   - Counterfactual: expressing what has not happened but could, would, or might under differing conditions
   - Did the stimulus fail? It depends on the counterfactual of what the unemployment rate would have been without the stimulus package from the Obama administration. In order to claim the Obama administration's efforts have failed the commentator would need to provide evidence of what the unemployment rate would have been without the stimulus. Nothing indicates the author did from what was provided in the question. Note: he did not do so in the article either.
   - "Failed" is not loaded terminology. A phrase such as "miserably failed" would be.
   - There is no confusion between correlation and causation; subsequently *post hoc* is not an issue.
   - Straw man received partial credit.

37. An article last year in *The Huffington Post*[1] stated that "[c]ollege textbook prices are 812 percent higher than they were a little more than three decades ago, the American Enterprise Institute, a think tank, reports. Textbook costs have well outpaced the 559 percent increase in tuition and fees over roughly the same period."

Percent Change Since 1978 for Educational Books, Medical Services, New Home Prices, and CPI
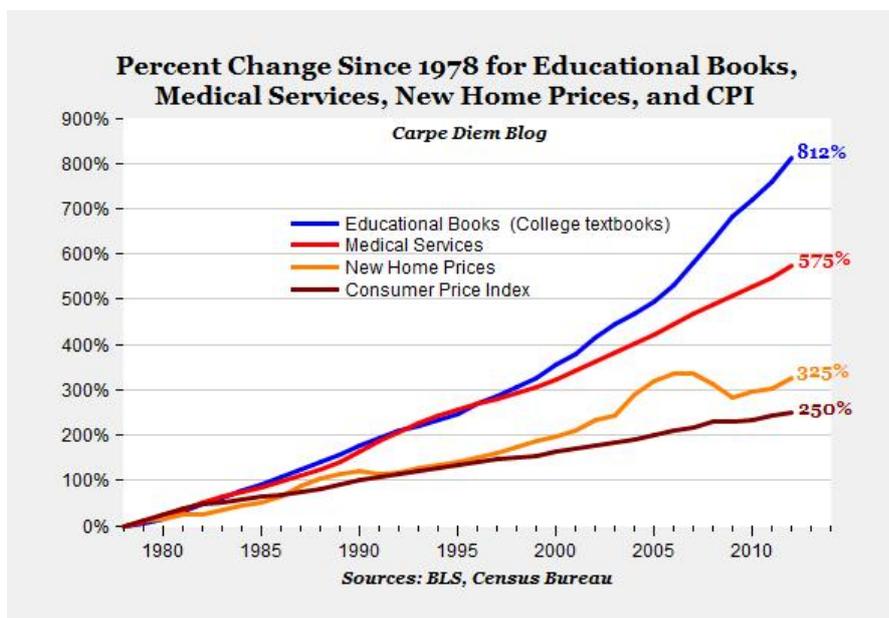
As a result of the relatively large increase in new textbook prices students are purchasing more textbooks online, particularly used textbooks.

(a) **[8 points]** True, False, or Uncertain: buying used textbooks from a U.S. seller online (e.g. through Half.com) does not affect U.S. GDP. Explain.

- False is the correct answer, but Uncertain is also acceptable conditional on the explanation.
- The sale of the used textbook itself would <u>not</u> count toward GDP. The textbook would have already been counted when it was newly sold. Being counted again as a used textbook would result in it being double-counted, at least partially. The problem is that nothing new has been produced. Further, countries would have an incentive to artificially inflate their GDP by simply selling and re-selling goods *ad infinitum*.
- However, the commission received from companies such as Half.com (or eBay or Amazon Marketplace) would count toward GDP, particularly consumption under services. Also, the used textbook would need to be shipped through, for example, the USPS, FedEx, UPS, DHL, etc. Using any of these companies' services would also contribute to GDP consumption.

[1] *The Huffington Post* "College Textbook Prices Increasing Faster Than Tuition And Inflation" 4th January 2013 by Tyler Kingkade http://www.huffingtonpost.com/2013/01/04/college-textbook-prices-increase_n_2409153.html

(b) **[8 points]** True, False, or Uncertain: The spread (i.e., difference) between textbook inflation and tuition/fees inflation is 253 percent. Explain.

- False
- The spread is 253 percentage points not percent.

US States Renamed for Countries with Similar GDPs, 2012