Econ 1, Fall 2010

University of California, Berkeley

Your name: ________________

GSI's name: ________________

Section #: ________________

Problem Set #2

Due at the beginning of lecture Wednesday, September 22, 2010

NOTE: To ensure proper grading, write your answers in the area indicated.

1. Explain whether or not, why, and how the following items are included in the calculation of GDP:
    a. The broadcast of a call-in TV show featuring an economics professor over the commercial-free public television network C-SPAN.

    b. The broadcast of a call-in TV show featuring an economics professor over the for-profit cable TV network Fox news.

    c. The purchase of a previously-built house.

    d. The rent you pay on your apartment.

    e. The sale of a used bicycle by its owner to Hank and Frank for $20, and then your purchase of that same bicycle for $60.

    f. Your purchase of a used bicycle via Craigslist for $40.

2. Let us think about very long-run economic growth in the longest possible perspective. In 8000 BC there were roughly 5 million people in the world; in 1800 there were roughly 750 million; today there are 7.5 billion. In 8000 BC GDP per capita worldwide was roughly $500 per year in today's dollars; in 1800 GDP per capita worldwide was roughly $600 per year; today GDP per capita is roughly $7,500 per year. Total worldwide GDP at any moment equals GDP per capita times the population. [For the purposes of this question, ignore the fact that the Gregorian calendar does not include a year zero.]

   a. What was the average annual growth rate—in percent per year—of population between 8000 BC and 1800?

   b. What was the average annual growth rate of population between 8000 BC and today?

   c. What was the average annual growth rate of GDP per capita between 8000 BC and 1800?

   d. What was the average annual growth rate of GDP per capita between 1800 and today?

   e. What was the average annual growth rate of total world GDP between 8000 BC and 1800?

   f. What was the average annual growth rate of total world GDP between 1800 and today?

   g. Why do they call it the "Industrial Revolution"?

3. Solve for the equilibrium level of real GDP Y in the Keynesian framework where $Y = C + O$ and $C = c_o + c_y Y$:

   a. With c_o = \$4 trillion/year, $c_y = 3/4$, O = \$2 trillion/year

   b. With c_o = \$5 trillion/year, $c_y = 1/2$, O = \$5 trillion/year

   c. With c_o = \$7 trillion/year, $c_y = 0$, O = \$7 trillion/year

   d. With c_o = \$4 trillion/year, $c_y = 1$, O = \$2 trillion/year

4. In the monetarist framework where $Y = (M/P) \cdot V$ and V is constant, solve for the equilibrium level of real GDP Y:

   a. If $V = 4$, M = \$4 trillion, and $P = 1.00$

   b. If $V = 6$, M = \$8 trillion, and $P = 2.00$

   c. If $V = 6$, M = \$12 trillion, and $P = 3.00$

d. If $V = 4$, M = \$4 trillion, and the price level P doubles from its initial value of $P = 1.00$ while the money stock M stays the same

e. If $V = 4$, M = \$4 trillion, $P = 1.00$, and the money stock and price level P both double

5. In the monetarist framework where $Y = (M/P) \cdot V$ and V is constant, solve for the equilibrium price level P:

a. If $V = 4$, M = \$4 trillion, and Y = \$16 trillion

b. If $V = 8$, M = \$3 trillion, and Y = \$16 trillion

c. If $V = 12$, M = \$2 trillion, and Y = \$16 trillion

d. If $V = 4$, M = \$4 trillion, and Y = \$16 trillion

e. If $V = 4$, M = \$12 trillion, and Y = \$16 trillion

f. If $V = 4$, M = \$24 trillion, and Y = \$16 trillion

6. In the monetarist framework $Y = (M/P) \cdot V$—real GDP Y equals the money stock M divided by the price level P times the velocity of money V— and $M = \mu \cdot R$—the money stock equals the money multiplier μ times cash-and-reserves R, solve for the equilibrium price level P:

   a. If $V = 4$, Y = \$16 trillion, R = \$1 trillion, and $\mu = 4$

   b. If $V = 4$, Y = \$16 trillion, R = \$1 trillion, and $\mu = 5$

   c. If $V = 6$, Y = \$16 trillion, R = \$1 trillion, and $\mu = 6$

   d. If $V = 3$, Y = \$16 trillion, R = \$1 trillion, and $\mu = 6$

   e. If $V = 3$, Y = \$16 trillion, R = \$1.5 trillion, and $\mu = 6$

   f. If $V = 4$, Y = \$16 trillion, R = \$2 trillion, and $\mu = 8$

7. In the Phillips Curve framework in which $\pi = E(\pi) + \beta(u^* - u)$—the inflation rate π equals the previously-expected inflation rate $E(\pi)$ plus the "slope" β times the difference between the natural rate of unemployment u^* and the actual rate of unemployment u—calculate the rate of inflation π:

   a. If $E(\pi)$ = 3% per year, $\beta = ½$, u^* = 5%, and u = 5%

b. If $E(\pi)$ = 9% per year, β = ½, u^* = 5%, and u = 5%

c. If $E(\pi)$ = 6% per year, β = ½, u^* = 5%, and u = 7%

d. If $E(\pi)$ = 6% per year, β = ½, u^* = 3%, and u = 9%

e. If $E(\pi)$ = 10% per year, β = ½, u^* = 7%, and u = 3%

f. If $E(\pi)$ = 3% per year, β = ½, u^* = 5%, and u = 5%

8. In the Phillips Curve framework in which $\pi = E(\pi) + \beta(u^* - u)$—the inflation rate π equals the previously-expected inflation rate $E(\pi)$ plus the "slope" β times the difference between the natural rate of unemployment u^* and the actual rate of unemployment u—and in which this year's expected inflation $E(\pi)$ is last year's actual inflation, calculate the rate of inflation π:

   a. In the first year, if the starting $E(\pi)$ = 10% per year, β = ½, u^* = 5%, and u = 5%

   b. In the second year, if $E(\pi)$ is what inflation was the previous year—that is, if $E(\pi)$ is your answer to part a, β = ½, u^* = 5%, and u = 9%

c. In the third year, if $E(\pi)$ is what inflation was the previous year—that is, if $E(\pi)$ is your answer to part b, $\beta = ½$, $u^* = 5\%$, and $u = 9\%$

d. In the fourth year, if $E(\pi)$ is what inflation was the previous year—that is, if $E(\pi)$ is your answer to part c, $\beta = ½$, $u^* = 5\%$, and $u = 9\%$

e. In the fifth year, if $E(\pi)$ is what inflation was the previous year—that is, if $E(\pi)$ is your answer to part a, $\beta = ½$, $u^* = 5\%$, and $u = 9\%$

9. In the Phillips Curve framework in which $\pi = E(\pi) + \beta(u^* - u)$—the inflation rate π equals the previously-expected inflation rate $E(\pi)$ plus the "slope" β times the difference between the natural rate of unemployment u^* and the actual rate of unemployment u—and in which this year's expected inflation $E(\pi)$ is last year's actual inflation, calculate the rate of inflation π:

a. In the first year, if the starting $E(\pi) = 2\%$ per year, $\beta = ½$, $u^* = 5\%$, and $u = 5\%$

b. In the second year, if $E(\pi)$ is what inflation was the previous year—that is, if $E(\pi)$ is your answer to part a, $\beta = ½$, $u = 5\%$, but structural changes in the economy raise u^* to 7%

c. In the third year, if $E(\pi)$ is what inflation was the previous year—that is, if $E(\pi)$ is your answer to part b, $\beta = ½$, $u = 5\%$, but structural changes in the economy keep u^* at 7%

d. In the fourth year, if $E(\pi)$ is what inflation was the previous year—that is, if $E(\pi)$ is your answer to part c, $\beta = ½$, $u = 5\%$, but structural changes in the economy keep u^* at 7%

e. What should the government and central bank do if they want to keep inflation from rising?

10. In the Phillips Curve framework in which $\pi = E(\pi) + \beta(u^* - u)$—the inflation rate π equals the previously-expected inflation rate $E(\pi)$ plus the "slope" β times the difference between the natural rate of unemployment u^* and the actual rate of unemployment u—and in which this year's expected inflation $E(\pi)$ is last year's actual inflation, calculate the rate of inflation π:

a. In the first year, if the starting $E(\pi)$ = 2% per year, β = ½, u^* = 5%, and u = 5%

b. In the second year, if $E(\pi)$ is what inflation was the previous year—that is, if $E(\pi)$ is your answer to part a, β = ½, u^* = 5%, but the government pursues expansionary stimulus policies to put America to work that reduce the unemployment rate to 3%

c. In the second year, if $E(\pi)$ is what inflation was the previous year—that is, if $E(\pi)$ is your answer to part b, β = ½, u^* = 5%, but the government's expansionary stimulus policies to put America to work keep the unemployment rate to 3%

d. In the third year, if $E(\pi)$ is what inflation was the previous year—that is, if $E(\pi)$ is your answer to part c, β = ½, u^* = 5%, but the government's expansionary stimulus policies to put America to work keep the unemployment rate to 3%

e. What should the government do if they want to keep inflation from rising?

11. Bond Prices. In the long-term bond price equation: $P^b = C/i^L$, where P^b is the price of a long-term bond, C is the annual coupon that the bond pays, and i^L is the long-term nominal interest rate on that bond, calculate the bond price P^b:

a. When C = \$60 and i^L = 6%

b. When C = \$60 and i^L = 6.5%

c. When C = \$60 and i^L = 7%

d. When C = \$40 and i^L = 4%

e. When C = \$40 and i^L = 8%

12. Bond Interest Rates. In the long-term bond price equation: $P^b = C/i^L$, where P^b is the price of a long-term bond, C is the annual coupon that the bond pays, and i^L is the long-term nominal interest rate on that bond, calculate the bond interest rate i^L:

a. When C = $60 and P^b = $1000

b. When C = $60 and P^b = $950

c. When C = $60 and P^b = $900

d. When C = $50 and P^b = $1000

e. When C = $50 and P^b = $1200

f. When C = $50 and P^b = $1400