

TOTAL SCORE _____

MC _____

EXE 1 _____

EXE 2 _____

EXE 3 _____

Econ 002- INTRO MACRO Prof. Luca Bossi May 12, 2014

FINAL EXAM -SUGGESTED 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, nor notes and any material.

Student Name (printed)

PennID

Signature

Date

Your TA Name (printed)

INSTRUCTIONS

The exam is closed book. It is composed of 40 multiple choice questions and three exercises. All multiple choice questions are worth 1.5 points (so the total is 60 points for the multiple choice 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. **ANSWER ALL QUESTIONS.**

TOTAL POINTS = 100. TOTAL TIME = 120 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. YOU CANNOT CONNECT TO THE INTERNET.

NO ASKING THE PROCTORS ANY QUESTION OR HELP TO SOLVE THE EXAM.

WRITE IN PENCIL OR IN PEN AS YOU LIKE, BUT IF YOU WRITE IN PENCIL THERE IS NO POSSIBILITY FOR RE-GRADING. PLEASE WRITE YOUR NAME ON THE FIRST PAGE OF THE EXAM AND ON THE MC BUBBLE PAGE. PLEASE FOLLOW THE INSTRUCTIONS AS TO HOW TO SUBMIT YOUR EXAM AT THE END OF THE 2 HOURS.

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

GOOD LUCK!

EXERCISE I (12 points total)

On planet Krypton the following are all the transactions that took place last year, firms do not hold any inventories. Transactions among firms are for intermediate goods unless stated otherwise. Note also that some of these transactions involve more than one firm and others involve consumers of this planet.

- Firm A sells its products for 30\$ to firm B, 50\$ to firm C, and 70\$ to firm D. It also sells 100\$ to Krypton’s consumers, and exports 40\$ to Mother Earth. It pays wages for 30\$, interests for 15\$, rent for 16\$, and finally it imports intermediate goods for 17\$.
 - Firm B sells its products for 50\$ to firm A, 80\$ to firm C, and 20\$ to firm D. It also sells 200\$ to Krypton’s consumers, and exports 30\$ abroad. It pays wages for 70\$, interests for 14\$, rent for 30\$, and finally it imports intermediate goods for 20\$.
 - Firm C sells its products for 80\$ to firm A, 40\$ to firm B, and 17\$ to firm D. It also sells 300\$ to Krypton’s consumers, and exports 100\$ abroad. It pays wages for 120\$, interests for 20\$, rent for 110\$, and finally it imports intermediate goods for 120\$.
 - Firm D sells 20\$ to firm A, 30\$ to firm B, and 80\$ to firm C. It also sells 400\$ to national consumers, and exports 35\$ abroad. It pays wages for 100\$, interests for 11\$, rent for 120\$, and finally it imports intermediate goods for 30\$.
- a) **(4 POINTS)** Find the value of Krypton’s nominal GDP according to the value added approach. Show your work and the details for each firm.
 - b) **(4 POINTS)** Find the value of Krypton’s nominal GDP according to the expenditure approach. Show your work and the details of each component.
 - c) **(4 POINTS)** Provide the definition of GDP according to the income approach (no need to compute it, just give the generic definition/formula). Compute profits for Firm A. Show your work and the details.

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Solution:

- a) **Value Added = Total sales – Intermediate goods bought**
GDP according to value added approach = sum of all value added by all firms at each stage of production.

Components	Firm A	Firm B	Firm C	Firm D	Total
Intermediate goods bought	\$167 = 17 + 50 + 80 + 20	\$120 = 30 + 40 + 30 + 20	\$330 = 50 + 80 + 80 + 120	\$137 = 70 + 20 + 17 + 30	\$754
Total Sales	\$290 = 30 + 50 + 70 + 100 + 40	\$380 = 50 + 80 + 20 + 200 + 30	\$537 = 80 + 40 + 17 + 300 + 100	\$565 = 20 + 30 + 80 + 400 + 35	\$1772
Value Added	\$123	\$260	\$207	\$428	\$1,018

- b) **GDP according to expenditure approach = C + I + G + NX**
C = 100 + 200 + 300 + 400 = 1,000
I = 0
G = 0
EXP = 40 + 30 + 100 + 35 = 205
IMP = 17 + 20 + 120 + 30 = 187

GDP = 1,018

- c) **GDP according to Income approach = wages + interests + rents + profits**

Components	Firm A
Wages	\$30
Interests	\$15
Rents	\$16
Intermediate goods bought	\$167
Sales to Firm A	0
Sales to Firm B	\$30
Sales to Firm C	\$50
Sales to Firm D	\$70
Sales to Consumers	\$100
Sales Abroad	\$40
Total Sales	\$290

Profits = total revenues - total costs = total sales – wages - interest – rents - costs of intermediate goods.

Note that the intermediate goods are a cost to the firms.

Components	Firm A
Profits	$290 - 30 - 15 - 16 - 167 = 62$

EXERCISE II (13 points total)

a) (3 POINTS) Write down and briefly explain the formula for the real exchange rate we have seen in class. This formula establishes a relationship between the real exchange rate (e) and the nominal exchange rate (E) and the price in the home country and the price abroad in an open economy. What does the Purchasing Power Parity (PPP) theory implies for both nominal and real exchange rates according to this formula?

b) (5 POINTS) Assume there are two countries: "home country" and "foreign country". PPP always holds across those countries. Suppose the GDP deflator in the home country at time t is labeled as P_t and the GDP deflator in the foreign country at time t is labeled as P_t^f .

Let $\pi_t = \frac{P_t - P_{t-1}}{P_{t-1}}$ define the inflation rate in the home country.

And let $\pi_t^f = \frac{P_t^f - P_{t-1}^f}{P_{t-1}^f}$ define the inflation rate in the foreign country.

Write the generic relationship that describes a small percentage increase of the nominal exchange rate between home and foreign country over one period (i.e. $\frac{E_t - E_{t-1}}{E_{t-1}}$) as a function of the inflation rate in the home country and of the inflation rate in the foreign country for that period.

c) (5 POINTS) Now assume that for both countries the quantity equation formula for the money supply expressed in terms of growth rates for each variable holds (i.e. the generic formula with the standard notation $g_M + g_V = inflation + g_Y$ is true for both countries).

Using the result of part b) of this exercise, if velocity is constant in both countries, and the GDP growth rate is 2% in the home country and 8% in the foreign country, and the money supply growth is 2% in the home country and 4% in the foreign country, what percentage increase should we expect of the nominal exchange rate between home and foreign country?

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Answers:

a) The formula is given by $e = PE/P^f$

The real exchange rate e measures the number of foreign baskets of goods that you can get for one local basket of goods. It tells us, for example, how many Big Macs in Buenos Aires one Big Mac in New York buys. Or how many Sarbucks lattes in Rio de Janeiro one latte in New York buys.

PPP implies that real exchange rate is equal to 1: $e = 1$. Thus it follows from the formula above that the nominal exchange rate is equal to the ratio of the foreign price to the domestic price: $E = \frac{P^f}{P}$.

b) When PPP holds the nominal exchange rate between home and foreign country at time t is:

$$E_t = \frac{P_t^f}{P_t}$$

At $t-1$ the nominal exchange rate was:

$$E_{t-1} = \frac{P_{t-1}^f}{P_{t-1}}$$

Percentage change of the nominal exchange rate is:

$$\frac{E_t - E_{t-1}}{E_{t-1}} = \frac{\frac{P_t^f}{P_t} - \frac{P_{t-1}^f}{P_{t-1}}}{\frac{P_{t-1}^f}{P_{t-1}}} = \frac{\frac{P_t^f}{P_t}}{\frac{P_{t-1}^f}{P_{t-1}}} - 1 = \frac{P_{t-1} * P_t^f}{P_t * P_{t-1}^f} - 1 = \frac{P_{t-1}}{P_t} * \frac{P_t^f}{P_{t-1}^f} - 1$$

Since $\pi_t = \frac{P_t - P_{t-1}}{P_{t-1}}$ then $\pi_t = \frac{P_t}{P_{t-1}} - 1 \Rightarrow \frac{P_t}{P_{t-1}} = 1 + \pi_t$ and $\frac{P_{t-1}}{P_t} = \frac{1}{1 + \pi_t}$

Analogously, since $\pi_t^f = \frac{P_t^f - P_{t-1}^f}{P_{t-1}^f}$ then $\frac{P_t^f}{P_{t-1}^f} = 1 + \pi_t^f$

It follows that

$$\frac{E_t - E_{t-1}}{E_{t-1}} = \frac{1 + \pi_t^f}{1 + \pi_t} - 1$$

c) For home country you know that $g_V = 0$, $g_Y = 2\%$, and $g_M = 2\%$ so $\pi = 0$

For the foreign country we know that $g_V = 0$, $g_Y = 8\%$, and $g_M = 4\%$ so $\pi^f = -4\%$

Plugging this values in the expression for the percentage increase of the nominal exchange rate we just got in part b), we should expect the nominal exchange to decrease by 4%:

$$\frac{E_t - E_{t-1}}{E_{t-1}} = \frac{1 + \pi_t^f}{1 + \pi_t} - 1 = \frac{1 - 4\%}{1 + 0} - 1 = -4\%$$

EXERCISE III (15 points total)

Consider the following production function:

$$Y_t = A * F(K_t, L_t) = A[\alpha K_t^\rho + (1 - \alpha)L_t^\rho]^{\frac{1}{\rho}}$$

Where $A > 0$ is TFP, L is labor and K is capital. The other parameters are restricted to be: $0 < \alpha < 1$, $\rho \leq 1$.

a) (5 POINTS) Is this production function constant return to scale, decreasing return to scale or increasing return to scale? Show your work.

Now consider the Solow model we have seen and studied in class. The production function is not the standard Cobb-Douglas though, but rather the production function just given above. Everything else in the model is the same.

b) (5 POINTS) Find the expression for the steady state level of physical capital per person only as a function of A , α , n , d , s , ρ . Show your work.

c) (5 POINTS) We now want to introduce a government in this Solow model. In particular, we assume all the production/income in the economy is taxed at a certain constant tax rate τ in each period. Assume that the government not only taxes, but also offers productive government spending that enhances total production in the economy. Think of this as the services coming from general infrastructures, public schools, police, firemen, army etc.. This being the case, the new production function for our economy now is:

$$Y_t = A * F(K_t, L_t, G_t) = A[\alpha K_t^\rho + \beta L_t^\rho + (1 - \alpha - \beta)G_t^\rho]^{\frac{1}{\rho}}$$

with $0 < \alpha + \beta < 1$, $\alpha > 0$, $\beta < 1$, $\rho \leq 1$. And where G_t is government spending. Suppose that the government is running a balanced budget every period and that there are no transfers.

Write the expression of total income/output of equilibrium only as a function of physical capital and labor and of the parameters A , α , β , ρ , τ . Show your work. (Hint: this part does not require you to derive the fundamental equation of the Solow model, nor the steady state).

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Answers

a) We need to check whether $\lambda * A * F(K_t, L_t)$ is greater, equal or smaller than $A * F(\lambda * K_t, \lambda * L_t)$:

$$\begin{aligned} A * F(\lambda * K_t, \lambda * L_t) &= A[\alpha(\lambda * K_t)^\rho + (1 - \alpha)(\lambda * L_t)^\rho]^{\frac{1}{\rho}} = A[\alpha\lambda^\rho K_t^\rho + (1 - \alpha)\lambda^\rho L_t^\rho]^{\frac{1}{\rho}} \\ &= A[\lambda^\rho(\alpha K_t^\rho + (1 - \alpha)L_t^\rho)]^{\frac{1}{\rho}} = \lambda A[\alpha K_t^\rho + (1 - \alpha)L_t^\rho]^{\frac{1}{\rho}} = \lambda * A * F(K_t, L_t) \end{aligned}$$

So this production function is CRS.

b) The five equations that define the Solow model now are

$$\begin{aligned} 1) Y_t &= A[\alpha K_t^\rho + (1 - \alpha)L_t^\rho]^{\frac{1}{\rho}} \\ 2) S_t &= sY_t \\ 3) I_t &= S_t \\ 4) K_{t+1} &= I_t + (1 - d)K_t \\ 5) L_{t+1} &= (1 + n)L_t \end{aligned}$$

Output per person in this case is:

$$\frac{Y_t}{L_t} = \frac{A[\alpha K_t^\rho + (1 - \alpha)L_t^\rho]^{\frac{1}{\rho}}}{L_t}$$

You have two possibilities to find it. Both are equally acceptable.

1) Since we know that the production function is CRS, then we just proved in part a) that

$$\lambda * A * F(K_t, L_t) = A * F(\lambda * K_t, \lambda * L_t)$$

If we choose $\lambda = \frac{1}{L_t}$, then we know that

$$\frac{A * F(K_t, L_t)}{L_t} = \frac{Y_t}{L_t} = A * F\left(\frac{K_t}{L_t}, 1\right)$$

In other words, output per person in this case is:

$$\frac{Y_t}{L_t} = A \left[\alpha \left(\frac{K_t}{L_t}\right)^\rho + (1 - \alpha) * 1 \right]^{\frac{1}{\rho}}$$

2) An alternative way to figure this out is to say:

$$Y_t = A[\alpha K_t^\rho + (1 - \alpha)L_t^\rho]^{\frac{1}{\rho}}$$

So

$$\begin{aligned} Y_t^\rho &= A[\alpha K_t^\rho + (1 - \alpha)L_t^\rho] \\ \frac{Y_t^\rho}{L_t^\rho} &= \frac{A[\alpha K_t^\rho + (1 - \alpha)L_t^\rho]}{L_t^\rho} \\ \left(\frac{Y_t}{L_t}\right)^\rho &= A \left[\alpha \left(\frac{K_t}{L_t}\right)^\rho + (1 - \alpha) * 1 \right] \end{aligned}$$

And again output per person in this case is:

$$\frac{Y_t}{L_t} = A \left[\alpha \left(\frac{K_t}{L_t}\right)^\rho + (1 - \alpha) * 1 \right]^{\frac{1}{\rho}}$$

With the small caps convention to denote per capita variables, the expression above becomes:

$$y_t = A[\alpha(k_t)^\rho + (1 - \alpha)]^{\frac{1}{\rho}}$$

Using the expression of output per capita you can derive with the usual procedure the fundamental equation with the small caps convention that represent per capita variables :

$$k_{t+1}(1 + n) = sA[\alpha(k_t)^\rho + (1 - \alpha)]^{\frac{1}{\rho}} + (1 - d)k_t$$

In steady state we know that:

$$k_{t+1} = k_t = \bar{k}$$

Plug this into the fundamental equation to obtain:

$$0 = sA[\alpha(\bar{k})^\rho + (1 - \alpha)]^{\frac{1}{\rho}} - (n + d)\bar{k}$$

Solving for \bar{k}

$$\begin{aligned} sA[\alpha(\bar{k})^\rho + (1 - \alpha)]^{\frac{1}{\rho}} &= (n + d)\bar{k} \\ s^\rho A^\rho [\alpha(\bar{k})^\rho + (1 - \alpha)] &= (n + d)^\rho \bar{k}^\rho \\ ((n + d)^\rho - s^\rho A^\rho \alpha) \bar{k}^\rho &= s^\rho A^\rho (1 - \alpha) \\ \bar{k} &= \left(\frac{s^\rho A^\rho (1 - \alpha)}{((n + d)^\rho - s^\rho A^\rho \alpha)} \right)^{\frac{1}{\rho}} \end{aligned}$$

c) Now the five equations are (equation 1) has changed):

$$1) Y_t = A[\alpha K_t^\rho + \beta L_t^\rho + (1 - \alpha - \beta)G_t^\rho]^{\frac{1}{\rho}}$$

$$2) S_t = s(1 - \tau)Y_t$$

$$3) I_t = S_t$$

$$4) K_{t+1} = I_t + (1 - d)K_t$$

$$5) L_{t+1} = (1 + n)L_t$$

To these we need to add also the equation for the balanced budget

$$6) G_t = T_t = \tau Y_t$$

Substitute 6) into 1):

$$Y_t = A[\alpha K_t^\rho + \beta L_t^\rho + (1 - \alpha - \beta)(\tau Y_t)^\rho]^{\frac{1}{\rho}}$$

Solve for Y_t :

$$Y_t^\rho = A^\rho[\alpha K_t^\rho + \beta L_t^\rho + (1 - \alpha - \beta)\tau^\rho Y_t^\rho]$$

$$Y_t^\rho(1 - A^\rho(1 - \alpha - \beta)\tau^\rho) = A^\rho[\alpha K_t^\rho + \beta L_t^\rho]$$

$$Y_t^\rho = \frac{A^\rho[\alpha K_t^\rho + \beta L_t^\rho]}{(1 - A^\rho(1 - \alpha - \beta)\tau^\rho)}$$

$$Y_t = \left\{ \frac{A^\rho[\alpha K_t^\rho + \beta L_t^\rho]}{(1 - A^\rho(1 - \alpha - \beta)\tau^\rho)} \right\}^{\frac{1}{\rho}}$$

MULTIPLE CHOICE QUESTIONS

Identify the letter of the choice that best completes the statement or answers the question. Fill in the bubble with your answer in the answer sheet for the MC provided on the last page of the exam.

- 1) Suppose the economy is in long-run equilibrium. If there is a sharp decline in the stock market combined with a significant increase in immigration of skilled workers, then in the short run,
- real GDP will rise and the price level might rise, fall, or stay the same. In the long-run, real GDP will rise and the price level might rise, fall, or stay the same.
 - the price level will fall, and real GDP might rise, fall, or stay the same. In the long-run, real GDP and the price level will be unaffected.
 - the price level will rise, and real GDP might rise, fall, or stay the same. In the long run, real GDP will rise and the price level will fall.
 - the price level will fall, and real GDP might rise, fall, or stay the same. In the long run, real GDP will rise and the price level will fall.**
- 2) Suppose the economy is in long-run equilibrium. If there is an income tax cut at the same time that major new sources of oil are discovered in the country, then in the short-run
- real GDP will rise and the price level might rise, fall, or stay the same.**
 - real GDP will fall and the price level might rise, fall, or stay the same.
 - the price level will rise, and real GDP might rise, fall, or stay the same.
 - the price level will fall, and real GDP might rise, fall, or stay the same.
- 3) If output is above its natural rate, then according to sticky-wage theory
- workers and firms will strike bargains for higher wages. This increase in wages shifts the short-run aggregate supply curve right.
 - workers and firms will strike bargains for higher wages. This increase in wages shifts the short-run aggregate supply curve left.**
 - workers and firms will strike bargains for lower wages. This decrease in wages shifts the short-run aggregate supply curve right.
 - workers and firms will strike bargains for lower wages. This decrease in wages shifts the short-run aggregate supply curve left.
- 4) Suppose the economy is in long-run equilibrium. If the government increases its expenditures, eventually the increase in aggregate demand causes price expectations to
- rise. This rise in price expectations shifts the short-run aggregate supply curve to the right.
 - rise. This rise in price expectations shifts the short-run aggregate supply curve to the left.**
 - fall. This fall in price expectations shifts the short-run aggregate supply curve to the right.
 - fall. This fall in price expectations shifts the short-run aggregate supply curve to the left.
- 5) An economic contraction caused by a shift in aggregate demand remedies itself over time as the expected price level
- rises, shifting aggregate demand right.
 - rises, shifting aggregate demand left.
 - falls, shifting aggregate supply right.**
 - falls, shifting aggregate supply left.
- 6) Which of the following is most likely to result if foreigners decide to withdraw the funds that they have loaned to the United States?
- U.S. net exports will rise**
 - U.S. net capital outflow will fall.
 - U.S. domestic investment will rise
 - the dollar will appreciate

7) In 2002, the United States placed higher tariffs on imports of steel. According to the open-economy macroeconomic model this policy should have

- a. reduced imports into the United States and made U.S. net exports rise.
- b. reduced imports into the United States and made the net supply of dollars in the foreign exchange market shift right.
- c. **reduced imports of steel into the United States, but reduced U.S. exports of other goods by an equal amount.**
- d. reduced imports of steel into the United States and increased U.S. exports of other goods by an equal amount.

8) Which of the following contains a list only of things that decrease when the budget deficit of the U.S. increases?

- a. **U.S. net exports, U.S. domestic investment, U.S. net capital outflow**
- b. U.S. supply of loanable funds, U.S. interest rates, U.S. domestic investment
- c. U.S. imports, U.S. interest rates, the real exchange rate of the dollar
- d. None of the above is correct.

9) If U.S. residents want to buy more foreign bonds, then in the market for foreign-currency exchange the exchange rate

- a. and the quantity of dollars traded rises.
- b. rises and the quantity of dollars traded falls.
- c. **falls and the quantity of dollars traded rises.**
- d. and the quantity of dollars traded falls.

10) Suppose the real exchange rate is such that the market for foreign-currency exchange has a surplus. This surplus will lead to

- a. an appreciation of the dollar, an increase in U.S. net exports, and so an increase in the quantity of dollars demanded in the foreign exchange market.
- b. an appreciation of the dollar, a decrease in U.S. net exports, and so a decrease in the quantity of dollars demanded in the foreign exchange market.
- c. **a depreciation of the dollar, an increase in U.S. net exports, and so an increase in the quantity of dollars demanded in the foreign exchange market.**
- d. a depreciation of the dollar, a decrease in U.S. net exports, and so a decrease in the quantity of dollars demanded in the foreign exchange market.

11) If there is a shortage of loanable funds, then

- a. the demand for loanable funds will shift right so the real interest rate rises.
- b. the supply of loanable funds will shift left so the real interest rate falls.
- c. **there will be no shifts of the curves, but the real interest rate rises.**
- d. there will be no shifts of the curves, but the real interest rate falls.

12) 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.

Table 1 -Labor Data for Aridia

Year	2010	2011	2012
Adult population	2000	3000	3200
Number of employed	1400	1300	1600
Number of unemployed	200	600	200

13) Refer to Table 1. The labor force of Aridia in 2010 was

- a. 1400.
- b. 1600.**
- c. 1800.
- d. 2000.

14) Refer to Table 1. The unemployment rate of Aridia

- a. increased from 2010 to 2011 and increased from 2011 to 2012.
- b. increased from 2010 to 2011 and decreased from 2011 to 2012.**
- c. decreased from 2010 to 2011 and increased from 2011 to 2012.
- d. decreased from 2010 to 2011 and decreased from 2011 to 2012.

15) Refer to Table 1. The labor-force participation rate of Aridia in 2011 was

- a. 43.3%.
- b. 54.2%.
- c. 63.3%.**
- d. 68.4%.

16) When inflation rises, the nominal interest rate

- a. rises, and people desire to hold less money.**
- b. rises, and people desire to hold more money.
- c. falls, and people desire to hold more money.
- d. falls, and people desire to hold less money

17) Suppose one year ago the price index was 120 and Maria purchased \$20,000 worth of bonds. One year later the price index is 126. Maria redeems his bonds for \$22,250 and is in a 40 percent tax bracket. What is Maria's real after-tax rate of interest to the nearest tenth of a percent?

- a. 4.3 percent
- b. 3.1 percent
- c. 1.8 percent**
- d. 1.2 percent

18) Which of the following is not implied by the quantity equation?

- a. If velocity is stable and money is neutral, an increase in the money supply creates a proportional increase in nominal output.
- b. If velocity is stable and money is neutral, an increase in the money supply creates a proportional increase in the price level.
- c. With constant money supply and output, an increase in velocity creates an increase in the price level.
- d. With constant money supply and velocity, an increase in output creates a proportional increase in the price level.**

- 19)** If the federal funds rate were above the level the Federal Reserve had targeted, the Fed could move the rate back towards its target by
- buying bonds. This buying would reduce reserves.
 - buying bonds. This buying would increase reserves.**
 - selling bonds. This selling would reduce reserves.
 - selling bonds. This selling would increase reserves.
- 20)** When the money market is drawn with the value of money on the vertical axis, as the price level decreases, the value of money
- increases, so the quantity of money demanded increases.
 - increases, so the quantity of money demanded decreases.**
 - decreases, so the quantity of money demanded decreases.
 - decreases, so the quantity of money demanded increases.
- 21)** A U.S. Treasury bond is a
- store of value, but not a common medium of exchange.**
 - store of value and common medium of exchange.
 - a common medium of exchange, but not a store of value.
 - neither a store of value nor a common medium of exchange.
- 22)** If 2002 is the base year, then the inflation rate in 2005 equals
- $\frac{\text{CPI in 2005} - \text{CPI in 2004}}{\text{CPI in 2002}} \times 100.$
 - $\frac{\text{CPI in 2005} - \text{CPI in 2002}}{\text{CPI in 2002}} \times 100.$
 - $\frac{\text{CPI in 2005} - \text{CPI in 2002}}{\text{CPI in 2004}} \times 100.$
 - $\frac{\text{CPI in 2005} - \text{CPI in 2004}}{\text{CPI in 2004}} \times 100.$
- 23)** The price index was 110 in the first year, 100 in the second year, and 96 in the third year. The economy experienced
- 9.1 percent deflation between the first and second years, and 4 percent deflation between the second and third years.**
 - 9.1 percent deflation between the first and second years, and 4.2 percent deflation between the second and third years.
 - 10 percent deflation between the first and second years, and 4 percent deflation between the second and third years.
 - 10 percent deflation between the first and second years, and 4.2 percent deflation between the second and third years.
- 24)** Foreign citizens earn more income in Ireland than Irish citizens earn in foreign countries.
- Ireland's net factor payments from abroad are positive, and its GDP is larger than its GNP.
 - Ireland's net factor payments from abroad are positive, and its GNP is larger than its GDP.
 - Ireland's net factor payments from abroad are negative, and its GDP is larger than its GNP.**
 - Ireland's net factor payments from abroad are negative, and its GNP is larger than its GDP.

25) Senator Smith says that in order to help poor countries develop, the United States should: 1. Prevent U.S. corporations from investing in poor countries because they take profits that the poor countries should have; 2. reduce or eliminate subsidies to U.S. producers when poor countries have a comparative advantage producing those goods the U.S. subsidizes; 3. Work to promote political stability in poor countries; and 4. Reduce poor countries reliance on market forces in their economies. How many of these ideas are likely to help poor countries grow?

- a. 1
- b. 2**
- c. 3
- d. 4

26) In 2009, the imaginary nation of Dorados had a population of 8,000 and real GDP of 3,000,000. During the year its real GDP per capita grew by about 2.9%. Which of the following sets of growth rates is approximately consistent with this growth in real GDP?

- a. 2% population growth and 6% real GDP growth
- b. 6% population growth and 2% real GDP growth
- c. 4% population growth and 7% real GDP growth**
- d. 7% population growth and 4% real GDP growth

27) A firm may pay efficiency wages in an attempt to

- a. reduce incentives to shirk.
- b. reduce turnover.
- c. attract a well-qualified pool of applicants.
- d. All of the above are correct.**

28) According to the quantity equation, the price level would change less than proportionately with a rise in the money supply if there were also

- a. either a rise in output or a fall in velocity.**
- b. either a rise in output or a rise in velocity.
- c. either a fall in output or a rise in velocity.
- d. either a fall in output or a fall in velocity.

29) There is evidence that the rate at which money changed hands rose during the German hyperinflation. This means that

- a. velocity rose. If monetary neutrality holds the rise in velocity increased the ratio M/P .
- b. velocity rose. If monetary neutrality holds the rise in velocity decreased the ratio M/P .**
- c. velocity fell. If monetary neutrality holds the fall in velocity increased the ratio M/P .
- d. velocity fell. If monetary neutrality holds the fall in velocity decreased the ratio M/P .

30) The federal funds rate is the interest rate

- a. the Federal Reserve charges for loans it makes to the federal government.
- b. the Federal Reserve charges banks for short-term loans.
- c. banks charge each other for short-term loans of reserves.**
- d. on newly issued one-year Treasury bonds.

31) A person who is risk averse might accept a 50% chance of losing \$100 today in exchange for a 50% chance of winning \$125 in two years if the interest rate was

- a. 9% but not 10%
- b. 10% but not 11%
- c. 11% but not 12%**
- d. None of the above is correct; a risk averse person would not accept any of the above bets.

32) Other things the same, if the government increases transfer payments to households, then the effect of this on the government's budget

- a. will make the rate of interest rise.
- b. will make investment rise.
- c. will make public saving rise.
- d. All of the above are correct.

33) Risk aversion helps to explain various things we observe in the economy, including

- a. adherence to the old adage, "Don't put all your eggs in one basket."
- b. insurance.
- c. the risk-return trade-off.
- d. All of the above are correct.

34) If the supply of loanable funds shifts to the right, then the equilibrium interest rate

- a. and quantity of loanable funds rise.
- b. and quantity of loanable funds fall.
- c. rises and the quantity of loanable funds falls.
- d. falls and the quantity of loanable funds rises.

35) If in a closed economy $Y = \$11$ trillion, which of the following combinations would be consistent with national saving of \$2.5 trillion?

- a. $C = \$8$ trillion, $G = \$0.5$ trillion
- b. $C = \$6.5$ trillion, $G = \$3$ trillion
- c. $C = \$8.5$ trillion, $G = \$2$ trillion
- d. $C = \$9$ trillion, $G = \$0.5$ trillion

36) If a country has \$2.4 billion of net exports and purchases \$4.8 billion of goods and services from foreign countries, then it has

- a. \$7.2 billion of exports and \$4.8 billion of imports.
- b. \$7.2 billion of imports and \$4.8 billion of exports.
- c. \$4.8 billion of exports and \$2.4 billion of imports.
- d. \$4.8 billion of imports and \$2.4 billion of exports.

37) In the United States, a three-pound can of coffee costs about \$5. If the exchange rate is about 0.8 euros per dollar and a three-pound can of coffee in Belgium costs about 7 euros. What is the real exchange rate?

- a. 7/4 cans of Belgian coffee per can of U.S. coffee
- b. 5.6/5 cans of Belgian coffee per can of U.S. coffee
- c. 5/5.6 cans of Belgian coffee per can of U.S. coffee
- d. 4/7 cans of Belgian coffee per can of U.S. coffee

38) Which of the following is human capital?

- a. understanding how to use a company's accounting software
- b. a student loan
- c. training videos for new corporate employees
- d. All of the above are correct.

- 39)** A ton of scrap iron sells for \$150 in the U.S. and 1400 yuan in China. The nominal exchange rate is 6.7 yuan per dollar.
- a. A profit could be made by buying scrap iron in China and selling it in the U.S. This would tend to drive down the price of U.S. scrap iron.
 - b. A profit could be made by buying scrap iron in China and selling it in the U.S. This would tend to drive down the price of Chinese scrap iron.
 - c. A profit could be made by buying scrap iron in the U.S. and selling it in China. This would tend to drive down the price of U.S. scrap iron.
 - d. **A profit could be made by buying scrap iron in the U.S. and selling it in China. This would tend to drive down the price of Chinese scrap iron.**
- 40)** The circular-flow diagram is a model that
- a. helps to explain how participants in the economy interact with one another.
 - b. helps to explain how the economy is organized.
 - c. has profits flowing from households to firms.
 - d. **Both (a) and (b) are correct.**

YOUR NAME: _____

YOUR TA's NAME: _____

**FILL IN THE BUBBLE WITH 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) |
| 22. | (A) | (B) | (C) | (D) |
| 23. | (A) | (B) | (C) | (D) |
| 24. | (A) | (B) | (C) | (D) |
| 25. | (A) | (B) | (C) | (D) |
| 26. | (A) | (B) | (C) | (D) |
| 27. | (A) | (B) | (C) | (D) |
| 28. | (A) | (B) | (C) | (D) |
| 29. | (A) | (B) | (C) | (D) |
| 30. | (A) | (B) | (C) | (D) |
| 31. | (A) | (B) | (C) | (D) |
| 32. | (A) | (B) | (C) | (D) |
| 33. | (A) | (B) | (C) | (D) |
| 34. | (A) | (B) | (C) | (D) |
| 35. | (A) | (B) | (C) | (D) |
| 36. | (A) | (B) | (C) | (D) |
| 37. | (A) | (B) | (C) | (D) |
| 38. | (A) | (B) | (C) | (D) |
| 39. | (A) | (B) | (C) | (D) |
| 40. | (A) | (B) | (C) | (D) |