

## Homework 1

Spring 2011 ECON 410  
Macroeconomic Theory

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Due 2/1/2011 (Tuesday)

(A) Multiple Choice Questions: (3 points per multiple choice problem) 25 questions. Please use scantron to answer multiple choice problems.

1. Macroeconomics does *not* try to answer the question of:
  - A) why do some countries experience rapid growth.
  - B) what is the rate of return on education.
  - C) why do some countries have high rates of inflation.
  - D) what causes recessions and depressions.
  
2. All of the following are important macroeconomic variables *except*:
  - A) Real GDP
  - B) The unemployment rate
  - C) The marginal rate of substitution
  - D) The inflation rate
  
3. A typical trend during a recession is that
  - A) The popularity of the incumbent president rises
  - B) Incomes fall
  - C) The unemployment rate falls
  - D) The inflation rate rises
  
4. Macroeconomists cannot conduct controlled experiments such as testing various tax and expenditure policies, because
  - A) It is against the law
  - B) They tried once and it did not work
  - C) The experiments would cost too much
  - D) Economists already know the answers that would come out of the experiments
  
5. Assume that apples cost \$0.50 in 2002 and \$1 in 2007, whereas oranges cost \$1 in 2002 and \$1.50 in 2007. If 4 apples were produced in 2002 and 5 in 2007, whereas 3 oranges were produced in 2002 and 5 in 2007, then the GDP of 2007, using a base year of 2002, is:
  - A) \$5
  - B) \$7.5
  - C) \$9.5
  - D) \$11
  
6. Real GDP \_\_\_\_\_ over time and the growth rate of real GDP \_\_\_\_\_.
  - A) grows; fluctuates
  - B) is steady; is steady
  - C) grows; is steady
  - D) is steady; fluctuates

7. In a simple graphical model of the supply and demand for pizza with the price of pizza measured vertically and the quantity of pizza measured horizontally:
- Both quantity and price of pizza are determined by the owner of the largest pizza store.
  - Quantity is determined by the price of the pizza.
  - Price is determined by the quantity purchased.
  - Both quantity and prices are simultaneously determined.
8. In the above model, when the price of hamburgers increases, the price of pizza \_\_\_\_ and the quantity purchased \_\_\_\_\_
- Increases; increase
  - Increases; decreases
  - Decreases; increases
  - Decreases; decreases
9. Given a Cobb-Douglas production of  $Y=K^\alpha L^{1-\alpha}$ , the marginal product of capital stock (MPK) is:
- $K^\alpha L^{1-\alpha}$ ,
  - $\alpha K^{\alpha-1} L^{1-\alpha}$ ,
  - $\alpha K^\alpha L^{1-\alpha}$ ,
  - $(1-\alpha)K^{\alpha-1} L^{-\alpha}$ ,
10. Given a Cobb-Douglas production of  $y=K^\alpha L^{1-\alpha}$ . If both  $K$  and  $L$  are increases by  $\Delta K$  and  $\Delta L$ , respectively, the total change in  $y$  would be:
- $\Delta K + \Delta L$
  - $\Delta K * \Delta L$
  - $MPK * \Delta K + MPL * \Delta L$
  - $(\Delta K)^\alpha (\Delta L)^{1-\alpha}$
11. “911” destroyed a large amount of capital stock in New York city. The neoclassical theory of distribution predicts (assuming New York city is isolated from the rest of the country):
- the real wage will rise and the real rental price of capital will fall
  - both the real wage and the real rental price of capital will fall
  - both the real wage and the real rental price of capital will rise
  - the real wage will fall and the real rental price of capital will rise
12. A large number of Cuban immigrants settled in the city of Miami during the Mariel Boatlift in 1980. The neoclassical theory predicts that the rental price of capital of the city should (if everything else is kept same):
- stay the same
  - lower
  - higher
  - uncertain

13. After the Mariel Boatlift, it is found that the real wage in the city of Miami was roughly the same. This is because the:
- A) minimum wage law did not change
  - B) the local labor market is competitive
  - C) immigrants mostly did not work and got money from the welfare system
  - D) immigrants brought more capital stock into the city
14. Assume that apples cost \$0.50 in 2002 and \$1 in 2007, whereas oranges cost \$1 in 2002 and \$1.50 in 2007. If 4 apples were produced in 2002 and 5 in 2007, whereas 3 oranges were produced in 2002 and 5 in 2007, then the GDP deflator in 2007, using a base year of 2002, was approximately:
- A) 1.7
  - B) 1.9
  - C) 2.0
  - D) 5
15. The national income accounts identity, for an open economy, is:
- A)  $Y=C+I+G-NX$
  - B)  $Y=C+I+G$
  - C)  $Y=C+I-G$
  - D)  $Y=C+I+G+NX$
16. \_\_\_\_\_ is part of GDP but \_\_\_\_\_ is not part of GDP.
- A) housing service; transportation service from a self-owned car
  - B) law enforcement; teaching service in public school
  - C) meals cooked at home; babysitting by parents
  - D) medical services from a for-profit hospital; medical service provided from a non-profit hospital
17. Use the model developed in Chapter 3 and assume that consumption does not depend on the interest rate. A technological advance that leads to an increase in investment demand:
- A) Investment increases and the interest rate rises
  - B) Investment increases and the interest rate falls
  - C) Investment is unchanged and the interest rate rises
  - D) Investment and the interest rate both unchanged
18. In the classical model with fixed income, a reduction in the government budget deficit will lead to a:
- A) higher real interest rate
  - B) lower real interest rate
  - C) higher level of output
  - D) lower level of output

19. If income is 4,800, consumption is 3,500, government spending is 1,000, and tax revenue is 800, private saving is:
- 300
  - 500
  - 1,000
  - 1,300
20. If output is described by the production function  $Y=AK^{0.2}L^{0.7}$ , then the production function has:
- Constant return to scale
  - Increasing return to scale
  - Decreasing return to scale
  - A return to scale that cannot be determined.
21. In a simple demand and supply model of pizza, \_\_\_\_\_ is an exogenous variable and \_\_\_\_\_ is an endogenous variable
- quantity; price
  - price; quantity
  - income; price of hamburger
  - price of hamburger; quantity
22. With a Cobb-Douglas production function, the share of output going to labor:
- decrease as the amount of labor increases
  - decrease as the amount of labor decreases
  - increases as the amount of capital decreases
  - is independent of the amount of labor
23. With a Cobb-Douglas production of  $Y=K^\alpha L^{1-\alpha}$
- Owners of capital stock earn more than workers
  - Owners of capital stock earn less than workers
  - Owners of capital stock and workers share the output equally
  - Owners of capital stock earns  $\alpha$  share of output
24. The people who are in the labor force:
- Are those people who can work
  - Decrease during the recession since less number of workers are looking for jobs
  - Increases during the recession since more workers are looking for jobs
  - Decreases during the recession since workers are less likely to look for jobs
25. The historical evidence show that a higher amount of military spending (often due to Wars) is associated with a higher interest rate. This suggests:
- A higher deficit is likely to cause a higher interest rate because less amount of money is available to lend.
  - A higher interest is likely to cause a higher deficit because of government has to pay more to borrow money.
  - Interest rates and deficits are only correlated at the time of wars.
  - Interest rates are determined by the central bank.

(B) Essay questions:

1. (10 points) Mankiw textbook, page 77, #9 – replicated below:

Consider an economy described by the following equations:

$$Y = C + I + G$$

$$Y = 5,000$$

$$G = 1,100$$

$$T = 1,000$$

$$C = 250 + 0.75*(Y-T)$$

$$I = 1,000 - 50r.$$

- In this economy, compute private saving, public saving, and national saving.
  - Find the equilibrium interest rate.
  - Now suppose that  $G$  raises to 1,250. Compute private saving, public saving, and national saving.
2. (15 points) Mankiw textbook, page 77, #6 – replicated below.

Consider a Cobb-Douglas production function with three inputs.  $K$  is capital (the number of machines),  $L$  is labor (the number of workers), and  $H$  is human capital (the number of college degrees among the workers). The production function is:

$$Y = K^{1/3}L^{1/3}H^{1/3}$$

- Derive an expression for the marginal product of labor. How does an increase in the amount of human capital affect the marginal product of labor?
- Derive an expression for the marginal product of human capital. How does an increase in the amount of human capital affect the marginal product of human capital?
- What is the income share paid to labor? What is income share paid to human capital? In the national income accounts of this economy, what share of total income do you think workers would appear to receive? (Hint: consider where return to human show up)
- An unskilled worker earns the marginal product of labor, whereas a skilled worker earns the marginal product of labor plus the marginal product of human capital. Using your answers to parts (a) and (b), find the ratio of the skilled wage to the unskilled wage. How does an increase in the amount of human capital affect this ratio? Explain.
- Some people advocate government funding of college scholarships as a way of creating a more egalitarian society. Others argue that scholarships help only those who are able to go to college. Do your answers to the preceding questions shed light on this debate?