MACROECONOMIC THEORY I
ECO2142 B
Fall 2016

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MIDTERM 1
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VERSION 1

Name_____

Student ID_____

- This exam is closed book/closed notes.
- The use of NONPROGRAMMABLE calculators is permitted. Cellular phones and all other electronic devices must be turned off and put away during the exam.
- The exam consists of a total of 33 questions each worth 3 points. Question n. 34 asks you to fill in the version of your exam; this question will give you 1 additional point to reach a total of 100. In addition, there is one bonus question worth 5 points.
- You have 1 hour and 15 minutes to complete the $34 + 1$ questions.
- Good luck!

1. Jason has just purchased a surfboard from the online store of Aftanas, a surfboard producer located in Tofino, BC (Canada). The surfboard is new, and it was produced in August 2016 in the Aftanas plant in Tofino. The price of the surfboard was $800, but Jason requested to have it painted in a special blue color, which cost an additional $50. Jason lives in Sausalito, CA (USA), and the surfboard will be delivered there. Aftanas didn't charge any handling or shipping fees.
   In the 2016 National Identity for Canada, the total contribution of this transaction to GDP is

   (a) $0
   (b) $50
   (c) $800
   (d) $850

2. Two weeks ago Catherine bought a 2012 condo apartment located in downtown Toronto for $350,000. Last Friday, Catherine had the condo re-painted from Colors & Co., a painting company located in Mississauga, ON. The painting service cost $700.
   In the 2016 National Identity for Canada, in which expenditure group is this transaction recorded?

   (a) In investment (I).
   (b) In consumption (C)
   (c) In imports (I).
   (d) This transaction does not affect the 2016 National Identity for Canada.

3. Yesterday Cristina took a three-hour French class at a Language School in Ottawa. Cristina is a Spanish woman living in Canada. The teacher of the class was prof. Pierre Morin, from Quebec. The class cost $60. This transaction

   (a) decreased GDP for Spain and did not affect GDP for Canada.
   (b) increased GDP for Canada and did not affect GDP for Spain.
   (c) increased GDP for both Canada and Spain.
   (d) did not affect GDP for either Canada or Spain.

4. Assume that Anne's consumption is a linear function of her disposable income. You observed that, after an increase in taxes (T) by $50, Anne's consumption ($C$) decreased by $40. If Anne's income ($Y$) did not change, you can deduce that her marginal propensity to consume is

   (a) -0.4
   (b) 0.4
   (c) 0.5
   (d) 0.8

5. Using 2010 as the base year, you computed that the CPI in the country of Yourland was 95 at the end of 2008 and 98.8 at the end of 2009. Between the end of 2008 and the end of 2009, the inflation rate in Yourland was

   (a) -3.8%
   (b) 1.2%
   (c) 4%
   (d) 5%

6. Consider the country of Enerland. In 2005, the inflation rate computed using the "CPI for all items" was 3%, while the inflation rate computed using the "CPI for all items less energy products" was 1%. Given this information, which of the following statements about Enerland in 2005 is most likely to be true?

   (a) The basket of goods and services used to compute the "CPI for all items" did not include any energy products.
   (b) The price of the energy products included in the basket of goods and services used to compute the "CPI for all items" decreased.
   (c) The price of the energy products included in the basket of goods and services used to compute the "CPI for all items" increased by more than 1%.
   (d) The price of all the goods and services included in basket used to compute the "CPI for all items less energy products" decreased.

7. Which of the following statements about Nominal GDP and Real GDP is true?

   (a) The growth rate of Nominal GDP is always higher than the growth rate of Real GDP.
   (b) The growth rate of Nominal GDP is always positive.
   (c) The growth rate of Real GDP is not affected by changes in the quantities of goods and services produced domestically.
   (d) The growth rate of Nominal GDP will be higher than the growth rate of Real GDP if the prices of the domestic production are increasing.

8. Hisland is a closed economy operating according to the Classical model. Assume that in Hisland savings are not affected by the level of the real interest rate. In this economy, an increase in taxes (T) will

   (a) decrease Public Savings and increase Private Savings.
   (b) increase both Public Savings and National Savings.
   (c) increase Public Savings and decrease National Savings.
   (d) decrease both Private Savings and National Savings.

9. Assume that the economy operates according to the Classical model. If the production function is $Y = 4K^{0.7}L^{0.3}$, then the capital's share of National income in this economy is equal to:

   (a) 0.3
   (b) 0.7
   (c) 1.2
   (d) 2.8

10. Maple & Co. is a maple farm located in Quebec, Canada. The maple syrup produced by this farm is mostly sold to customers in the United States, and it is included in the CPI basket of goods and services typically consumed by a U.S. citizen. The same maple syrup is also included in the CPI basket of goods and services typically consumed by a Canadian citizen. An increase in the price of the maple syrup produced by Maple & Co. would

   (a) increase both the GDP deflator and the CPI in the United States and in Canada.
   (b) increase the GDP deflator in the United States and in Canada, and increase the CPI in Canada only.
   (c) increase the CPI in the United States and in Canada, and increase the GDP deflator in the United States only.
   (d) increase the CPI in the United States and in Canada, and increase the GDP deflator in Canada only.

11. Money Bank has deposits for $200,000 and is currently holding a reserve-deposit ratio of 12%. If the reserve-deposit ratio is decreased to 10%

   (a) Money Bank's extended loans will need to be reduced by $20,000.
   (b) Money Bank's extended loans could be increased by $4,000.
   (c) Money Bank's reserves will need to be increased by $4,000.
   (d) Money Bank's deposits will need to be reduced by $24,000.

12. The country of Yourland operates according to the Classical model, and produces output using a Cobb-Douglas production function. Assume that this country suddenly faces a major natural disaster, which significantly reduces the stock of capital $\overline{K}$. Luckily, no one is harmed by this disaster, so the stock of labor $\overline{L}$ remains unchanged. Assume that the parameters A and α in the Cobb-Douglas production function remain unchanged as well. Recall that if an economy produces output according to the Cobb-Douglas production function $Y = AK^{\alpha}L^{(1-\alpha)}$, then $MPL = (1-\alpha)AK^{\alpha}L^{-\alpha}$ and $MPK = \alpha AK^{(\alpha-1)}L^{(1-\alpha)}$

   Which of the following do you expect to observe?

   (a) Output will decrease, the real wage will decrease, and the real rental price of capital will increase.
   (b) Output will decrease, and both the real wage and the real rental price of capital will increase.
   (c) Output will decrease, the real wage will remain unchanged, and the real rental price of capital will increase.
   (d) Output will increase, and both the real wage and the real rental price of capital will decrease.

13. Herland is a closed economy which operates according to the Classical model. Consider the market for loanable funds in Herland, and assume that savings are fixed and do not depend on the real interest rate. You know that the Investment function is $I = 700 - 20r$ (where r is the real interest rate), Government spending is $\overline{G} = 240$ and taxes are $\overline{T} = 190$. If the equilibrium real interest rate is $r = 5$, then National Savings in Herland are

    (a) -50.
    (b) 50.
    (c) 600.
    (d) 650.

14. Assume that the marginal product of labor is $MPL = 10\left(K^{0.5}\right)\left(L^{-0.5}\right)$. If the stock of capital in the economy is $K = 64$, what is the quantity of labor demanded when the equilibrium real wage is $W/P = 20$?

    (a) $L = 128$
    (b) $L = 80$
    (c) $L = 16$
    (d) $L = 8$

15. Assume that the Quantity Theory of Money holds, and that the economy is closed and operates according to the Classical model. Which of the following variables will be affected by an open market purchase of Government bonds implemented by the Central Bank?

    (a) the real interest rate.
    (b) National Savings.
    (c) Real GDP.
    (d) Nominal GDP.

16. Which of the following actions would decrease the M1 measure of the money supply?

    (a) Paul withdraws \$150 cash from his personal savings deposit.
    (b) Vicky withdraws \$80 cash from her checking account.
    (c) Anthony uses \$2,000 from his personal savings deposit to repay his credit card balance.
    (d) Marc transfers \$1,000 from his checking account to his personal savings deposit.

17. According to the Quantity Equation, if the money supply is \$7 billion and Nominal GDP is \$14 billion, then the velocity of money is equal to

    (a) 0.5.
    (b) 1.
    (c) 2.
    (d) 7.

18. Consider the standard formula for Okun's law:

    change in unemployment rate $= -0.5$[growth rate of Real GDP $- 4$].

    Recall that in this formula a growth rate of Real GDP of $X\%$ is written as X.
    Assume that the Government of a country successfully implemented a set of policies that reduced the unemployment rate during 2015. According to Okun's law, the growth rate of Real GDP in this country in the same year must have been

    (a) negative.
    (b) zero.
    (c) positive, but smaller than 4%.
    (d) positive, and larger than 4%.

19. Consider the money market with the money demand function obtained from the quantity equation: $(M/P)^d = (1/V)Y$. Which of the following statements is **not** true?

    (a) If Real GDP increases while the velocity of money remains unchanged, then the quantity of real money balances that people want to hold will increase.
    (b) If the velocity of money increases while Real GDP remains unchanged, then the quantity of real money balances that people want to hold will decrease.
    (c) If the money supply increases while Real GDP and the velocity of money remain unchanged, then the price level will have to increase in order to keep the quantity of real money balances that people want to hold unchanged.
    (d) If the money supply increases while the velocity of money remain unchanged, then Real GDP will have to decrease in order to keep the quantity of real money balances that people want to hold unchanged.

20. Assume that the labor market for strawberry pickers is currently in equilibrium, and that the real wage is \$10 per hour. If a new law sets the minimum real wage for strawberry pickers to \$15 per hour, then

    (a) the number of strawberry pickers who are employed will increase.
    (b) the number of strawberry pickers who are employed will decrease.
    (c) the real wage in the labor market for strawberry pickers will not change.
    (d) the real wage in the labor market for strawberry pickers will decrease.

21. Which of the following would increase the steady-state unemployment rate?

    (a) The creation of a new online job search platform that facilitates matching between employers and workers, thus increasing the job finding rate.
    (b) A change in employment protection laws that decreases the job separation rate.
    (c) The shift to a more generous employment insurance program, which has the unintended consequence of decreasing the job finding rate.
    (d) A new public job training program which successfully increases the job finding rate.

22. Which of the following actions would the Central Bank of a country implement to decrease the monetary base B?

    (a) A decrease in the bank rate.

    (b) A switch of government deposits from the Central Bank to chartered banks.

    (c) An open market purchase of federal government bonds.

    (d) An open market sale of federal government bonds.

23. Consider the money demand equation $(M/P)^d = L(i, Y)$ together with the Fisher equation $i = r + E\pi$. If people expect that the Central Bank will decrease the growth rate of the money supply in the future, but there is no actual change in the money supply now:

    (a) expected inflation will decrease, the quantity of real money balances demanded will increase, and the price level will decrease.

    (b) expected inflation will decrease, the quantity of real money balances demanded will decrease, and the price level will increase.

    (c) expected inflation will increase, the real interest rate will increase, and investment will increase.

    (d) expected inflation will decrease and the quantity of real money balances demanded will not change.

Problem 1 - **Use the following information to answer questions 24 - 29**

Consider a closed economy operating according to the Classical model. The production function is:

$Y = (50)K^{0.75}L^{0.25}$

where K and L are the capital and labor used in the production of output Y.

The consumption and investment functions are:

$C = 20 + 0.8(Y - T)$

$I = 240 - 20r$

where T is the amount of taxes and r is the real interest rate.

You know that the stocks of the factors of production in this economy are: $\overline{K} = 16$ and $\overline{L} = 81$. In addition, you know that taxes are $\overline{T} = 100$ and Government spending is $\overline{G} = 140$.

Recall that if an economy produces output according to the Cobb-Douglas production function $Y = AK^{\alpha}L^{(1-\alpha)}$, then $MPL = (1-\alpha)AK^{\alpha}L^{-\alpha}$ and $MPK = \alpha AK^{(\alpha-1)}L^{(1-\alpha)}$

24. The equilibrium real rental rate of capital in this economy is:

    (a) $R/P = 5.06$
    (b) $R/P = 19.25$
    (c) $R/P = 56.25$
    (d) $W/P = 3.70$

25. The share of National income paid to labor in this economy is:

    (a) 160
    (b) 202.5
    (c) 300
    (d) 900

26. The amount of Private Savings in this economy is:

    (a) -40
    (b) 160
    (c) 200
    (d) 1040

27. The equilibrium real interest rate in this economy is:

    (a) $r = 2$
    (b) $r = 3.7$
    (c) $r = 4$
    (d) $r = 20$

28. Assuming that everything else remains unchanged, which of the following would **increase** the equilibrium interest rate r?

    (a) A change in the investment function from $I = 240 - 20r$ to $I = 200 - 20r$.

    (b) An increase in government spending from $\overline{G} = 140$ to $\overline{G} = 150$.

    (c) A change in the consumption function from $C = 20 + 0.8(Y - T)$ to $C = 20 + 0.6(Y - T)$.

    (d) An increase in the stock of labor from $\overline{L} = 81$ to $\overline{L} = 90$.

29. Assuming that everything else remains unchanged, which of the following would **increase** the equilibrium real wage W/P?

    (a) An increase in the Marginal Propensity to Consume (MPC) from 0.8 to 0.9.

    (b) An increase in the stock of labor from $\overline{L} = 81$ to $\overline{L} = 90$.

    (c) An increase in government spending from $\overline{G} = 140$ to $\overline{G} = 150$.

    (d) An increase in the technology parameter in the production function from $A = 50$ to $A = 60$.

Problem 2 - **Use the following information to answer questions 30 - 33**

In the country of Myland the reserve-deposit ratio (rr) is 0.10 and the currency-deposit ratio (cr) is 0.05. The Central Bank of Myland is responsible for deciding the monetary policy in this country. Assume that the Central Bank of Myland has just implemented an expansionary monetary policy, which successfully increased the monetary base B by \$4 million.

30. Given the amount of the increase in the monetary base B and the values of the reserve-deposit ratio (rr) and the currency-deposit ratio (cr) in this country, the overall change in the money supply M will be

    (a) a decrease by \$0.4 million.

    (b) an increase by \$0.6 million.

    (c) an increase by \$28 million.

    (d) an increase by \$40 million.

31. Assume that the citizens of this country suddenly decide to hold all of their money in the form of deposits, so that the currency-deposit ratio becomes $cr = 0$. Nothing changes in the preferences of private banks, so the reserve-deposit ratio remains $rr = 0.10$. The value of the money multiplier in this case would become:

    (a) 0.1

    (b) 7

    (c) 10

    (d) 20

32. If the reserve-deposit ratio (rr) in this country changes from $rr = 0.10$ to $rr = 0.16$, then

    (a) private banks will use a larger fractions of their deposits to give out loans, and the money multiplier will increase.

    (b) private banks will use a larger fractions of their deposits to give out loans, and the money multiplier will decrease.

    (c) private banks will use a smaller fractions of their deposits to give out loans, and the money multiplier will increase.

    (d) private banks will use a smaller fractions of their deposits to give out loans, and the money multiplier will decrease.

33. Assume that Myland operates according to the Classical model and that the Quantity Theory of Money holds. If the Central Bank of Myland successfully implements a policy that increases the money supply M, then which of the following will also happen?

    (a) The real interest rate in this country will decrease.

    (b) The price level in this country will increase.

    (c) The quantity of labor used in production in this country will increase.

    (d) National saving in this country will decrease.

34. Fill in your exam version (you can find this information in the front page).

    (a) Version 1

    (b) Version 2

    (c) Version 3

    (d) Version 4

35. **BONUS QUESTION.** Assume that the world works according to the Classical model. There are only two countries in the world, Country 1 and Country 2, that produce output according to the following Cobb-Douglas production functions:

$$Y_1 = 120\,(K_1)^{0.75}\,(L_1)^{0.25} \qquad \text{(Country 1)}$$

$$Y_2 = 15\,(K_2)^{0.75}\,(L_2)^{0.25} \qquad \text{(Country 2)}$$

Country 1 and Country 2 have the same stock of capital: $K_1 = K_2 = 81$. Assume that capital cannot be moved from a country to the other.

The workers who are citizens of Country 1 are $L_1^* = 150$, while the workers who are citizens of Country 2 are $L_2^* = 20$. However, there is free mobility of workers in this world, so some of the workers in Country 2 moved to Country 1 until the real wage became the same in both countries: $\left(\frac{W}{P}\right)_1 = \left(\frac{W}{P}\right)_2$. This implies that there are currently L_1 workers employed in Country 1 (the L_1^* workers who are citizens of Country 1 plus some workers who are citizens of Country 2), and L_2 workers employed in Country 2 (all of them are citizens of Country 2).

Find these values of L_1 and L_2 for which $\left(\frac{W}{P}\right)_1 = \left(\frac{W}{P}\right)_2$. Make sure to check that $L_1 + L_2 = L_1^* + L_2^*$.

Recall that if an economy produces output according to the Cobb-Douglas production function $Y = AK^{\alpha}L^{(1-\alpha)}$, then $MPL = (1-\alpha)AK^{\alpha}L^{-\alpha}$ and $MPK = \alpha AK^{(\alpha-1)}L^{(1-\alpha)}$

(a) $L_1 = 240$ and $L_2 = 15$.

(b) $L_1 = 89$ and $L_2 = 81$.

(c) $L_1 = 170$ and $L_2 = 0$.

(d) $L_1 = 160$ and $L_2 = 10$.

(e) $L_1 = 150$ and $L_2 = 20$.

Answers:

1. d	8. b	15. d	22. d	29. d
2. b	9. b	16. d	23. a	30. c
3. b	10. d	17. c	24. c	31. c
4. d	11. b	18. d	25. c	32. d
5. c	12. a	19. d	26. c	33. b
6. c	13. c	20. b	27. c	34. a
7. d	14. c	21. c	28. b	35. d