

ECON 311 - Intermediate Macroeconomics (Professor Gordon)

First Midterm Examination: Winter 2019

Answer sheet

YOUR NAME: _____

Net ID: _____

Circle the TA session you attend: Aleksandra – 3PM Kristina - 3PM Sergio - 3PM Valentin – 3PM
 Aleksandra - 4PM Kristina - 4PM Sergio - 4PM Valentin – 4PM

INSTRUCTIONS:

1. The exam lasts **1 hour**.
2. The exam is worth 60 points in total: 30 points for the multiple choice questions (Part A) and 30 points for the four analytical problems (Part B).
3. **Write your answers for part A (the multiple choice section) in the blanks below.** You won't get credit for circled answers in the multiple choice section.
4. **Place all of your answers for part B in the space provided.**
5. You must show your work for part B questions. There is no need to explain your answers for the multiple choice questions.
6. **You must turn in both the answers and the multiple-choice questions. DO NOT PULL THEM APART.**

Good luck!

PART A: Multiple Choice Problems

Answer multiple choice questions in the space provided below.

USE CAPITAL LETTERS.

1	B	6	D	11	C	16	A	21	B	26	A
2	C	7	C	12	D	17	D	22	D	27	D
3	A	8	C	13	D	18	B	23	C	28	B
4	C	9	C	14	C	19	A	24	A	29	D
5	B	10	C	15	B	20	A	25	C	30	A

PART B: Analytic Problems

QUESTION 1 (4 points)

The following table lists GDP and the number of years it takes GDP to double, for two countries A and B in 2018. For example, if the doubling time for country A is 10 years, then the GDP doubles every ten years.

	GDP in 2018	Doubling time
Country A	3000	10 years
Country B	2000	5 years

If both countries continue to grow at the same rate, how long will it take for country B to catch up with country A in terms of GDP? (Hint: $\ln(x/y) = \ln(x) - \ln(y)$. You will need to use a bit of algebra to solve this).

Show your work!

A: Growth rate is $100 \cdot \ln(2)/10 = 6.931\%$.

B: Growth rate is $100 \cdot \ln(2)/5 = 13.862\%$.

$6.931 = 100 \cdot \ln(x/3000)/s$.

$13.862 = 100 \cdot \ln(x/2000)/s$. x is the value where they converge, and s is how long convergence takes.

$13.862 \cdot [\ln(x) - \ln(2000)] = 6.931 \cdot [\ln(x) - \ln(3000)] \Rightarrow x = 4500, s = 5.850 \text{ years}$

QUESTION 2 (10 points)

Suppose there is an economy that only produces coffee and sugar. The following table lists prices and production for the years 2017 and 2018:

	2017	2018
Prices		
Coffee	6	10
Sugar	9	8
Quantities		
Coffee	10	8
Ramen	4	10

a) What was nominal GDP for the years 2017 and 2018? (2 points)

	2017	2018
Nominal GDP	$6 \cdot 10 + 9 \cdot 4 = 96$	$10 \cdot 8 + 8 \cdot 10 = 160$

b) Calculate two indices for real GDP in 2018 if 2017 is normalized to 1 - one based on 2017 prices, one based on 2018 prices. Mark your results clearly. (4 points)

Index for 2018 using 2017 prices	2018 in 2017 prices: $6*8+9*10=138$ Index = $138/96 = 1.4375$
Index for 2018 using 2018 prices	2017 in 2018 prices: $10*10+4*8 = 132$ Index = $160/132 = 1.21$

c) Using (b), calculate the chain-weight index of real GDP in 2018 (if 2017 is normalized to 1). (1 point)

Chain-weight index of real GDP in 2018	$\text{sqrt}(1.4375*1.21) = 1.3189 \approx 1.32$
---	--

d) Using 2017 as the base year, calculate real GDP in 2018. (1 point)

Chain weighted real GDP in 2018 (2017 as base year)	$96*1.32 = 126.72$
--	--------------------

e) What was the inflation rate in 2018? (2 points)

Inflation rate in 2018	GDP Deflator 2018: $160/126.72=1.26$ Inflation: $100*\ln(1.26)=23.32\%$
-------------------------------	--

QUESTION 3 (16 points)

Consider an economy characterized by

$$C = 170 + 0.6(Y - T)$$

$$I_p = 40$$

$$G = 350$$

$$T = 200$$

$$NX = 0$$

a) Use the Keynesian Cross model to find equilibrium Y . (2 points)

In equilibrium $Y = E_p$	$E_p = C + I_p + G + NX$ $= 170 + 0.6(Y - 200) + 40 + 350$ $= 170 + 0.6Y - 120 + 40 + 350$ $= 440 + 0.6Y$ $Y = 440 + 0.6Y$ $0.4Y = 440$ $Y = 1100$
--------------------------	---

- b) What will be the effect on Y of an increase in G by 50 ($\Delta G = 50$) financed with a corresponding increase in T by 50 ($\Delta T = 50$). (2 points)

$$\begin{aligned} E_p &= 170 + 0.6(Y - (200 + 50)) + 40 + (350 + 50) \\ &= 170 + 0.6(Y - 250) + 40 + 400 \\ &= 170 + 0.6Y - 150 + 40 + 400 \\ &= 460 + 0.6Y \end{aligned}$$

In equilibrium $Y = E_p$

$$\begin{aligned} Y &= 460 + 0.6Y \\ 0.4Y &= 460 \\ Y &= \mathbf{1150} \\ \Delta Y &= \mathbf{1150 - 1100 = 50} \end{aligned}$$

Now suppose that in the above model investment depends on the interest rate

$$I_p = 100 - 4r$$

- c) Derive the IS curve (2 points)

$$\begin{aligned} E_p &= C + I_p + G + NX \\ &= 170 + 0.6(Y - 200) + 100 - 4r + 350 \\ &= 500 + 0.6y - 4r \end{aligned}$$

The IS curve is the equilibrium relation in the goods market (relates Y to r)

$$\begin{aligned} Y &= 500 + 0.6y - 4r \\ 0.4Y &= 500 - 4r \\ Y &= \mathbf{1250 - 10r} \text{ or } \mathbf{r = 125 - 0.1Y} \end{aligned}$$

In this economy, the real demand and supply for money is characterized by

$$\begin{aligned} \left(\frac{M^s}{P}\right) &= 735 \\ \left(\frac{M}{P}\right)^d &= 0.75Y - 6r \end{aligned}$$

- d) Derive the LM curve (2 points)

The LM curve is given by equilibrium between the demand and supply of real money

$$\begin{aligned} \left(\frac{M^s}{P}\right) &= \left(\frac{M}{P}\right)^d \\ 735 &= 0.75Y - 6r \\ r &= \mathbf{0.125Y - 122.5} \text{ or } \mathbf{Y = 980 + 8r} \end{aligned}$$

- e) Find the IS-LM model equilibrium values for Y , r , I and C . (4 points)

$$\begin{aligned} r &= 125 - 0.1Y \quad (\text{IS}) \\ r &= 0.125Y - 122.5 \quad (\text{LM}) \end{aligned}$$

Equilibrium in the IS-LM model is obtained by solving the system of equations.

$$\begin{aligned}
247.5 &= 0.225Y \\
\mathbf{Y} &= \mathbf{1100} \\
r &= 125 - 0.1Y \\
r &= 125 - 0.1(1100) \\
\mathbf{r} &= \mathbf{15} \\
I &= 100 - 4r \\
I &= 100 - 4(15) \\
\mathbf{I} &= \mathbf{40} \\
C &= 170 + 0.6(Y - 100) \\
C &= 170 + 0.6(1100) - 120 \\
\mathbf{C} &= \mathbf{710}
\end{aligned}$$

- f) What will happen to the IS curve in this model if the government increases G by 50 ($\Delta G = 50$) financed with a corresponding increase in T by 50 ($\Delta T = 50$). Derive the new IS curve. (2 points)

In equilibrium

$$\begin{aligned}
E_p &= 170 + 0.6(Y - 250) + 100 - 4r + 400 \\
&= 0.6Y + 520 - 4r
\end{aligned}$$

$$Y = 0.6Y + 520 - 4r$$

$$0.4Y = 520 - 4r$$

$$\mathbf{Y = 1300 - 10r \text{ or } r = 130 - 0.1Y}$$

- g) Find Y in the new IS-LM equilibrium. Compare this answer to part b) and provide the economic intuition for this result. (2 points)

Solve new system of equations (new IS and same LM)

$$130 - 0.1Y = 0.125Y - 122.5$$

$$252.5 = 0.225Y$$

$$\mathbf{Y = 1122.22}$$

The rise in Y is smaller. As the interest rate goes up then investment falls.

PART A: Multiple Choice Problems

Choose the one alternative that best completes the statement or answers the question.

1. The natural unemployment rate equals the actual unemployment rate when:

- A) Inflation is on its long-term growth path
- B) Inflation is constant**
- C) Inflation equals the natural unemployment rate
- D) Nominal GDP equals actual real GDP

2. Prior to the major recession of 2007-2009, the biggest previous recession of the postwar period happened in

- A) 1962
- B) 1972
- C) 1982**
- D) 1992

3. There are two main types of stabilization policy:

- A) Fiscal and monetary, influencing the level of aggregate demand**
- B) Fiscal and monetary, influencing the level of aggregate supply
- C) Open and closed, influencing the level of aggregate demand
- D) Open and closed, influencing the level of aggregate supply

4. The productivity growth rate in Europe compared to the United States was:

- A) higher in 1970 and in 2010
- B) lower in 1970 and in 2010
- C) higher in 1970 and lower in 2010**
- D) lower in 1970 and higher in 2010

5. Over the period from 1980 to now, the long-term interest rate (also known as the government 10-year bond rate)

- A) mainly increased
- B) mainly decreased**
- C) increased until 2000 then decreased
- D) decreased until 2000 then increased

6. Business cycles typically occur at ____ intervals and have ____ lengths:

- A) regular; different
- B) irregular; similar
- C) regular; similar
- D) irregular; different**

7. One long-term goal of economic policymakers is to:

- A) make the unemployment rate zero
- B) make the inflation rate decelerate as fast as possible
- C) make productivity growth as fast as possible**
- D) make net exports as high as possible

8. The unemployment rate includes all but which of the following categories?

- A) people who quit their jobs
- B) people who are laid off from their jobs
- C) people who have part-time jobs but want full-time jobs**

D) people who are looking for a summer job after the end of the school year

9. The cars produced by Toyota in its factory in Kentucky _____ in U.S. GDP and _____ in U.S. GNP.

A) count, count

B) do not count, count

C) count, do not count

D) do not count, do not count

10. In order to determine personal income, what adjustments have to be made to national income?

A) subtract undistributed corporate profits, social security taxes, government transfers, and then add private interest payments

B) subtract corporate income tax and social security taxes and then add corporate dividends, government transfers, and private interest payments

C) subtract undistributed corporate profits, corporate income tax, social security taxes, and then add government transfers and private interest payments

D) subtract undistributed corporate profits, corporate consumption allowance, corporate income tax, social security tax and then add government transfers and private interest payments

11. An increase in the stock market tends to

A) raise net exports

B) raise autonomous saving

C) reduce autonomous saving

D) raise transfer payments

12. Indicate which of the following individuals would be included in the labor force as defined by the Census Bureau.

A) a man waiting for recall from a layoff

B) a teenager looking for a part-time job

C) a woman who has accepted a new job but has not yet begun working

D) All of the above would be included in the labor force.

13. Three major factors that affect autonomous consumption are:

A) Real GDP, ease of borrowing, the unemployment rate

B) Household wealth, the unemployment rate, the inflation rate

C) The inflation rate, the interest rate, household wealth

D) The interest rate, household wealth, ease of borrowing

14. The research report on tax cuts and rebates in the course packet concluded that

A) the marginal propensity to consume was 0.7 to 0.8

B) the extra money was deposited in saving accounts

C) the extra money was used to pay off debts

D) the extra money was used to for major purchases

15. If the marginal propensity to save (s) is 0.1, income (Y) is 1000, and net exports (NX) are 100, then planned autonomous spending (A_p) is:

A) 90

B) 100

C) 900

D) 11000

16. Suppose the IS curve is determined using $A_p = 1000 - 200r$ and $k = 2.0$. If the economy changes such that now $A_p = 1000 - 100r$ and $k = 4.0$, how does the IS curve move?

- A) **It shifts right and becomes steeper**
- B) It shifts left and becomes shallower
- C) It shifts right with no change in slope
- D) It becomes steeper and does not shift left or right

17. The *Economist* article on the IS-LM model

- A) explained high interest rates by the IS curve moving to the right
- B) explained low interest rates by the IS curve moving to the left
- C) explained high interest rates by the LM curve moving to the left
- D) **explained low interest rates by the LM curve moving to the right**

18. If the interest rate falls, then autonomous consumption (C_a) ____, net exports (NX) ____, and planned investment (I_p) ____:

- A) decreases; stay constant; decreases
- B) **increases; stay constant; increases**
- C) decreases; decreases; increases
- D) stays constant; stay constant; increases

19. If the marginal propensity to consume is $c = 0.5$, then the government multiplier is ____ and the tax multiplier is ____:

- A) **2.0 ; -1.0**
- B) 2.0 ; -2.0
- C) 1.0 ; -0.5
- D) 1.0 ; -1.0

20. The course packet article on the weak housing recovery blamed the weakness on all but the following:

- A) **high default rate on mortgages**
- B) low supply of new houses
- C) tight mortgage lending standards
- D) delay in the age of marriage and child-bearing

21. If the marginal propensity to consume is $c = 0.75$, then the balanced budget multiplier is:

- A) -0.5
- B) **1.0**
- C) 3.0
- D) 4.0

22. _____ is the most volatile component of GDP. If it falls sharply, it tends to decrease consumption expenditures as well through a _____:

- A) Planned investment ; recessionary effect
- B) Government spending ; recessionary effect
- C) Government spending ; multiplier effect
- D) **Planned investment ; multiplier effect**

23. Just before a recession, businesses tend to see:

- A) an unintended rise in job applicants

- B) an unintended fall in stock prices
- C) an unintended rise in inventories**
- D) an unintended rise in productivity

24. The *IS* curve identifies the combinations of income and the interest rate at which:

- A) the commodity market is in equilibrium**
- B) the unemployment rate is constant
- C) the commodity and money markets are in equilibrium
- D) the money market is in equilibrium

25. Suppose that we are at a point on the money demand schedule where $(M/P) = 500$. At a constant interest rate, the quantity of money demanded increases when real income _____ so that _____.

- A) rises, the money demand schedule shifts to the left
- B) rises, we move downward along the money demand schedule
- C) rises, the money demand schedule shifts to the right**
- D) falls, we move upward along the money demand schedule

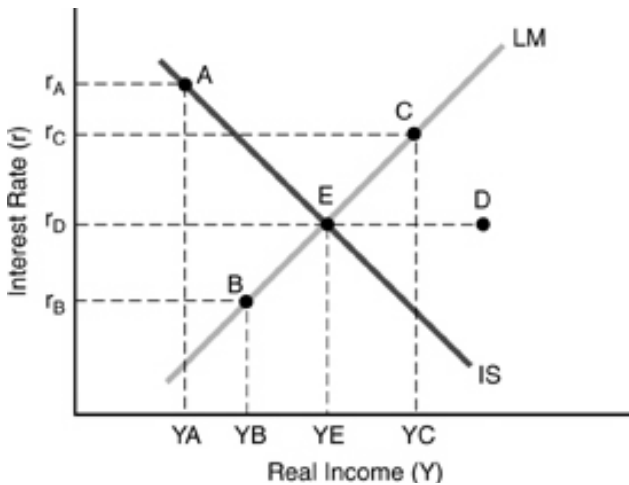
26. The "velocity" of money is

- A) the ratio of real GDP to the real money supply.**
- B) the money supply divided by the price level.
- C) the real money supply divided by the real GDP.
- D) the money supply multiplied by the price level.

27. Suppose the government increases its expenditures by \$100 million and finances the resulting deficit by selling bonds. Then the LM curve will

- A) become steeper.
- B) shift rightward.
- C) shift leftward.
- D) None of these.**

Figure 4-5



28. In Figure 4-5 above, at what income would the interest rate that brings about money market equilibrium cause unwanted inventories of commodities to accumulate?

- A) YA
- B) YC**
- C) YB
- D) YE

29. During the recession phase of the business cycle, business firms become pessimistic about their future earning capacity as do banks. Nominal interest rates fall during recessions. Investment lending could be expected to

- A) rise if the change in future earnings is thought to be greater than the change in interest payments.
- B) fall.
- C) stay the same.
- D) fall if the change in future earnings is thought to be greater than the change in interest payments.**

30. Crowding-out is eliminated when the LM curve is _____, so that expansionary fiscal policy _____ the interest rate.

- A) horizontal, does not affect**
- B) horizontal, raises
- C) vertical, does not affect
- D) vertical, raises