

ECON 311 - Intermediate Macroeconomics (Professor Gordon)

First Midterm Examination: Fall 2015

Answer sheet

YOUR NAME: _____

Student ID: _____

Circle the TA session you attend: Chris – 10AM Michael - 3PM Hugh - 3PM
 Chris - 3PM Michael - 4PM Hugh - 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			6			11		16		21		26	
2			7			12		17		22		27	
3			8			13		18		23		28	
4			9			14		19		24		29	
5			10			15		20		25		30	

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 2015. For example, if the doubling time for country A is 10 years, then the GDP doubles every ten years.

	GDP in 2015	Doubling time
Country A	1500	10 years
Country B	1000	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 $100 \cdot \ln(2)/10 = 6.93\%$.

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

$6.93 = 100 \cdot \ln(x/1500)/s$.

$13.862 = 100 \cdot \ln(x/1000)/s$. x is the value where they converge, and s is how long convergence takes.

$2 = \ln(x/1000)/\ln(x/1500)$, $2 \cdot (\ln(x) - \ln(1500)) = \ln(x) - \ln(1000)$, $\ln(x) = 2 \cdot \ln(1500) - \ln(1000)$, $x = 2250$, **$s = 5.850$ years**

QUESTION 2 (4 points)

On an ISLM diagram, show in each of the four regions whether there is an excess supply of money or excess demand for money, and similarly whether there is an excess supply of goods or an excess demand for goods.

Top: ESS, ESG. Bottom: ED\$, EDG
Left: ESS, EDG. Right: ED\$, ESG.

QUESTION 3 (8 points)

Suppose there is an economy that only produces coffee and ramen. The following table lists prices and production for the years 2014 and 2015:

	2014	2015
Prices		
Coffee	2	3
Ramen	6	4
Quantities		
Coffee	8	12
Ramen	6	3

a) What was nominal GDP for the years 2014 and 2015? (2 points)

	2014	2015
Nominal GDP	$2 \cdot 8 + 6 \cdot 6 = 52$	$3 \cdot 12 + 4 \cdot 3 = 48$

b) Calculate two indices for real GDP in 2015 if 2014 is normalized to 1 - one based on 2014 prices, one based on 2015 prices. Mark your results clearly. (4 points)

Index for 2015 using 2014 prices	2015 in 2014 prices: $12 \cdot 2 + 3 \cdot 6 = 42$ Index = $42 / 52 = 0.8077$
index for 2015 using 2015 prices	2014 in 2015 prices: $8 \cdot 3 + 6 \cdot 4 = 48$ Index = $48 / 48 = 1$

c) Using (b), calculate the chain-weight index of real GDP in 2015 (if 2014 is normalized to 1). (1 point)

Chain-weight index of real GDP in 2014	$\sqrt{1 \cdot 0.80777} = 0.899$
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d) Using 2014 as the base year, calculate real GDP in 2015. (1 point)

Chain weighted real GDP in 2015 (2014 as base year)	$52 \cdot 0.899 = 46.735$
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QUESTION 4 (14 points)

Consider an economy described by the following equations:

$$C = 107 - 2*r + 0.75*(Y - T)$$

$$I_p = 120 - 5*r$$

$$T = 40 + 0.1*Y$$

$$G = 75$$

$$NX = 40 - 0.175*Y$$

$$(M/P)^d = 0.4*Y - 5.2*r$$

$$M^s/P = 120$$

- a) Using the above numbers: write on three separate lines the equation showing the relationship of autonomous planned spending to the interest rate; the value of the multiplier; and the equation for the IS curve with all the specific numbers plugged in. (3 points)

Autonomous planned spending	$A_p = C_a - c*T_a + I_p + G + NX_a = 312 - 7*r$
The value of the multiplier	$k = 1/((1-c)*(1-t)+t+nx) = 2$
IS curve	The IS curve : $Y = k*A_p = 624 - 14*r$

- b) Derive the **LM curve**, using the ingredients listed above. (2 points)

$$M_d/P = M_s/P$$

$$0.4*Y - 5.2*r = 120 \quad \text{or} \quad Y = 300 + 13*r$$

- c) Find the equilibrium values of **income** and **interest rate**. (Hint: if you found equations for income above, then calculate the interest rate by combining the IS and LM curves separately; if you found equations for the interest rate above, then calculate the level of income using the IS and LM curves separately.) (2 points)

$$624 - 14*r = 300 + 13*r$$
$$27*r = 324 \rightarrow r = 12$$
$$Y = 300 + 13*12 = 456.$$

- d) The government decides to decrease autonomous taxes from **Ta=40** to **Ta=22**. What are the new levels of **GDP** and the **interest rate**? By how much did the government surplus change? (Note: **T=22+0.1*Y** is the new tax schedule; government surplus is defined by 'T-G') (4 points)

The change to $T=22+0.1*Y$ increases A_p to $A_p = 325.5 - 7*r$, which changes the IS equation to $Y = 2*(325.5 - 7*r) = 651 - 14*r$

The LM curve equation stays the same $Y = 300 + 13*r$

So the new values of (Y,r) are

$$Y = 469, r = 13$$

Government deficit before the change: $T-G = 40+0.1*456-75 = 10.6$

Government deficit after the change: $T-G = 22+0.1*469-75 = -6.1$

$$\text{Change} = -18+0.1*13 = 10.6+6.1 = 16.7$$

- e) The decrease in autonomous taxes described in (d) caused a change in the interest rate. The central bank wants to get interest rate to its previous value by changing the money supply. What should the new **real money supply** be? (Hint: Calculate the GDP first, then find the money supply using r) (3 points)

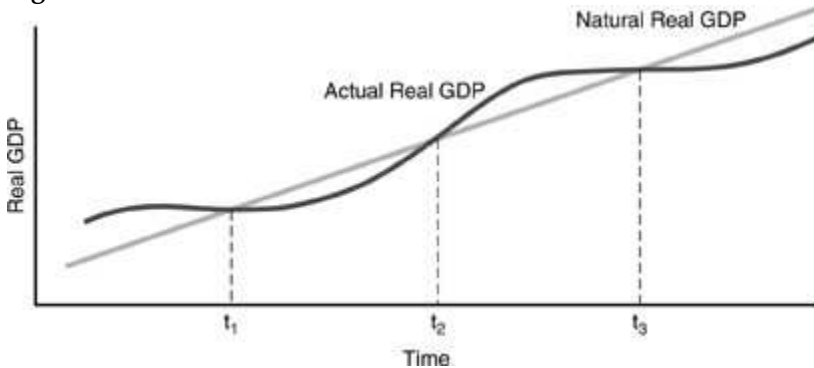
$$Y=483, \text{ because } Y = 651-14*r \text{ and } r=12$$
$$(M_s/P) = (M_d/P) = 0.4*Y - 5.2*r = 130.8$$

PART A: Multiple Choice Problems

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

- 1) The unemployment rate is the number of
- A) people looking for work divided by the population.
 - B) jobless individuals divided by the total labor force.
 - C) jobless individuals looking for work divided by those employed and unemployed but actively looking.
 - D) jobless people looking for work divided by the population.

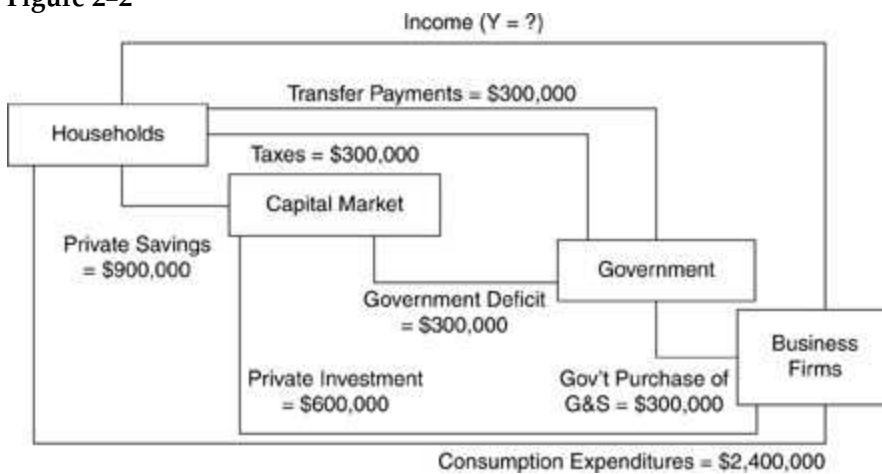
Figure 1-2



- 2) When the actual real GDP exceeds the natural real GDP as in Figure 1-2 above, we expect to find that unemployment is
- A) low and inflation is low.
 - B) high and inflation is low.
 - C) low and inflation is high.
 - D) high and inflation is high.
- 3) The lecture on the first day handout emphasized which of the following as being much worse in 2009-15 than in the 1981-82 recession and its aftermath?
- A) the total unemployment rate
 - B) the employment-population ratio
 - C) the long-run unemployment rate
 - D) the labor-force participation rate
 - E) the short-run unemployment rate
- 4) In an economy where actual real GDP is always equal to the natural real GDP, inflation
- A) fluctuates around an average of zero percent.
 - B) is at the same rate as GDP growth.
 - C) is constant at a rate that can be low or high.
 - D) settles down to zero percent.
- 5) The lecture on the first day handout listed several reasons why the total Federal government debt held by the domestic private sector is \$4,160 billion, compared to \$17,600 billion for the total debt. Which is not one of these reasons?
- A) debt held by the Social Security trust fund
 - B) debt held by private banks
 - C) debt held by the Federal Reserve banks
 - D) debt held by foreigners

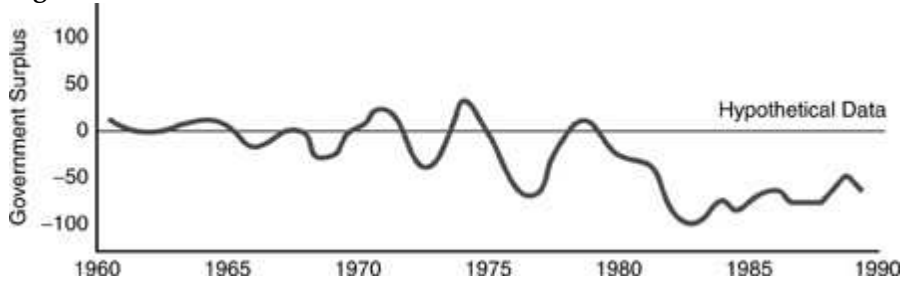
- 6) The U.S. business cycle record, in common with most, has
- A) peaks lasting longer than troughs.
 - B) troughs lasting longer than peaks.
 - C) expansions lasting longer than recessions.
 - D) recessions lasting longer than expansions.
- 7) Are government activities of any concern to macroeconomists?
- A) No, since macroeconomists study hypothetical economies that have no government involvement at all.
 - B) Yes, since macroeconomics is defined as the study of the role that government plays in the economy.
 - C) Yes, since government actions and policies can affect an economy's overall performance.
 - D) No, since the government cannot affect the functioning of the private economy.
- 8) The real income per capita is a measure of the
- A) total well-being of the nation.
 - B) well-being of every individual in the nation.
 - C) well-being of the average employed person in the nation.
 - D) well-being of the average individual in the nation.

Figure 2-2



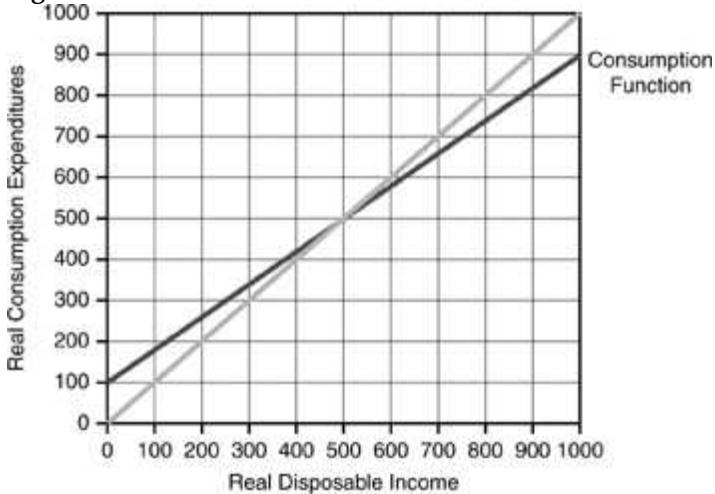
- 9) Employing the data from Figure 2-2, income Y is equal to
- A) \$3,300,000.
 - B) \$3,000,000.
 - C) \$3,600,000.
 - D) \$5,100,000.
- 10) Which of the following is NOT a "flow" variable?
- A) government debt
 - B) labor services
 - C) income
 - D) consumption expenditure

Figure 2-1



- 11) Assuming a closed economy (i.e., $NX = 0$) the data in Figure 2-1 suggest that for each year after 1980
- A) private saving was negative.
 - B) private saving was positive.
 - C) private saving equaled zero.
 - D) private saving could have been either positive or negative.
- 12) From the perspective of households the uses of income are
- A) taxes, investment, consumption of domestically produced and imported goods.
 - B) taxes, saving, consumption, exports, and imports.
 - C) taxes, saving, consumption of domestically produced and imported goods.
 - D) None of the above.
- 13) The natural rate of inflation
- A) rises when the unemployment gap is negative
 - B) rises when the unemployment gap is positive
 - C) falls when the output gap is negative
 - D) does not exist
- 14) If real GDP has increased, which of the following statements is always true?
- A) Nominal GDP has increased.
 - B) Output might have decreased if prices have risen enough.
 - C) Output has increased.
 - D) Prices have remained the same.
- 15) Stability of the U.S. economy between 1985 and 2007 referred to as
- A) the Great Depression.
 - B) Great Moderation.
 - C) Fiscal Discretion.
 - D) Automatic Stabilizer.
- 16) In the simple Keynesian model of the determination of income, the price level is assumed to be
- A) endogenous and to remain constant.
 - B) endogenous and to gradually change.
 - C) exogenous and to gradually change.
 - D) exogenous and to remain constant.
- 17) The lecture on Europe vs. the US concluded that over the past five years (2010-2015)
- A) US unemployment rate has been lower and US productivity growth has been faster
 - B) US unemployment rate has been lower and US productivity growth has been slower
 - C) US unemployment rate has been higher and US productivity growth has been faster
 - D) US unemployment rate has been higher and US productivity growth has been slower

Figure 3-2



18) Employing the information in Figure 3-2 above, when real disposable income is 1000, savings from households would be _____ and the marginal propensity to save would be _____.

- A) 100; 0.1
- B) 100; 0.2
- C) 300; 0.1
- D) 500; 0.2

19) Total income is always equal to _____ expenditures; but only in equilibrium is it equal to _____ expenditures, producing in equilibrium _____ on income to change.

- A) actual, planned, no pressure
- B) planned, actual, no pressure
- C) planned, actual, pressure
- D) actual, planned, pressure

20) Except in 2009 and 2010, the normal duration of unemployment benefits is

- A) 3 months
- B) 6 months
- C) 12 months
- D) 24 months

21) A \$1 increase in autonomous spending has a multiplier effect greater than one on total expenditures and output because

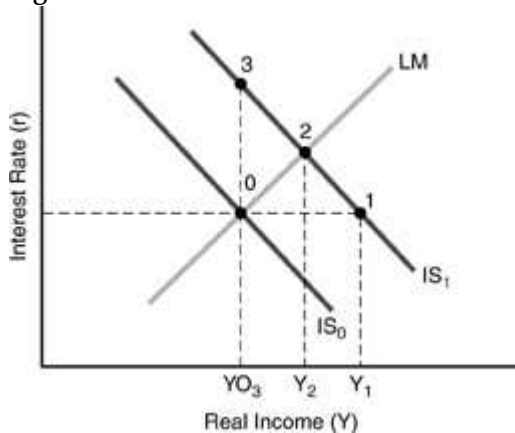
- A) each expenditure is respent in the same amount continuously.
- B) overtime expenditures tend to increase.
- C) each time an expenditure occurs the recipient responds a proportion of the funds.
- D) total expenditures include autonomous expenditures.

22) The inauguration of a new President often increases the degree of optimism in business firms and households, causing Ap to

- A) rise and IS to shift leftward.
- B) rise and IS to shift rightward.
- C) fall and IS to shift leftward.
- D) fall and IS to increase.

- 23) If the interest rate were to rise, we expect that
- A) autonomous expenditures will rise.
 - B) the amount of money people want to hold will fall.
 - C) the supply of money will fall.
 - D) the amount of money people want to hold will rise.
- 24) The lecture on the article "Lighter Ball and Chain" stated that the subject of the article was
- A) lower consumption since the Great Recession
 - B) lower saving since the Great Recession
 - C) lower private debt since the Great Recession
 - D) lower debt service since the Great Recession
- 25) A change in the multiplier (k) will change the
- A) slope of the IS curve.
 - B) position of the LM curve.
 - C) slope of the LM curve.
 - D) slope and the position of the IS curve.
- 26) The Chapter 3 multiplier, because it assumes an _____ interest rate, is usually an _____ of the fiscal policy multiplier in the IS-LM model.
- A) exogenous, underestimate
 - B) endogenous, underestimate
 - C) endogenous, overestimate
 - D) exogenous, overestimate

Figure 4-6



- 27) In Figure 4-6 above, with IS_0 shifting to IS_1 , movement from points 0 to 2 requires the real money supply to _____.
- A) remain constant
 - B) rise by the same percentage as income
 - C) fall by the same percentage as income
 - D) none of the above
- 28) Monetary policy is _____ and fiscal policy is _____ when the IS curve is steep and the LM curve is flat
- A) weak; weak
 - B) weak; strong
 - C) strong; strong
 - D) strong; weak

29) One of the major chains of causation in macroeconomic policymaking is government manipulation of _____ in order to affect _____, and thus ultimately _____.

- A) the money supply, equilibrium income, the interest rate
- B) equilibrium income, the interest rate, the money supply
- C) the money supply, the interest rate, equilibrium income
- D) equilibrium income, the money supply, the interest rate
- E) the interest rate, equilibrium income, the money supply

30) The *Economist* article on "A Working Model" tries to answer the puzzle as to why (when it was written in 2005):

- A) output was high and the interest rate was high
- B) output was high and the interest rate was low
- C) output was low and the interest rate was high
- D) output was low and the interest rate was low

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