

ECON 311 - Intermediate Macroeconomics (Professor Gordon)
First Midterm Examination: Winter 2021

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. You must show your work for part B questions. There is no need to explain your answers for the multiple choice questions.
4. Round your answers to **2 decimal points**.

Good luck!

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

- 1) The "Big Three" concepts of Macroeconomics are
 - A) federal budget, foreign trade, and quantitative easing.
 - B) unemployment rate, inflation, and economic growth.
 - C) asset rebalancing, markups, and profitability.
 - D) profits, liquidity, and sustainability.

- 2) Suppose that the natural rate of unemployment is 5.7 percent. If unemployment has for some time been varying between 5.1 and 5.3 percent, we should be at an actual real GDP _____ the natural real GDP, and should expect inflation to be _____.
 - A) above, constant
 - B) above, speeding up
 - C) above, slowing down
 - D) below, slowing down
 - E) below, speeding up

- 3) The following countries have experienced hyperinflation in the 21st century
 - A) Venezuela and Hungary.
 - B) Venezuela and Zimbabwe
 - C) Hungary and Zimbabwe.
 - D) Germany and Hungary.

- 4) A variable which is independent of the level of income is
 - A) endogenous.
 - B) exogenous.
 - C) autonomous.
 - D) irrelevant to any theory of income determination.

- 5) Suppose that steel produced this year is used to produce a car sold next year. The value of the steel _____ included in GDP this year as _____.
 - A) is; an intermediate good
 - B) is not; an intermediate good
 - C) is not; an adjustment to inventories
 - D) is; an adjustment to inventories

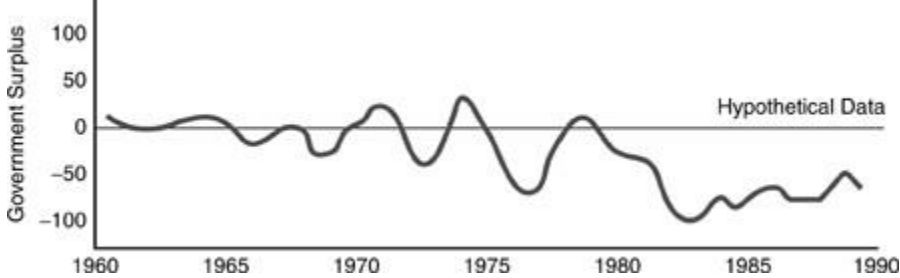
- 6) The unemployment rate is the number of
 - A) jobless individuals divided by the total labor force.
 - B) people looking for work divided by the population.
 - C) jobless individuals looking for work divided by those employed and unemployed but actively looking.
 - D) jobless people looking for work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

- 7) If you have no job and did not look for work in the past 4 weeks but did look for work in the past 12 months, you are counted as
 - A) discouraged employed
 - B) discouraged worker

- C) marginally attached worker
- D) marginally attached employed

- 8) During which decade were housing starts per member of the population lowest?
- A) 1980s
 - B) 1990s
 - C) 2000s
 - D) 2010s

Figure 1



- 9) Assuming a closed economy (i.e., $NX = 0$) the data in Figure 1 suggest that for each year after 1980
- A) private saving was positive.
 - B) private saving was negative.
 - C) private saving could have been either positive or negative.
 - D) private saving equaled zero.

- 10) Monetary policy will have a large income effect provided the
- A) sensitivity of autonomous spending to interest rates is high.
 - B) sensitivity of output changes to interest rates is small.
 - C) sensitivity of autonomous spending to interest rates is low.
 - D) None of the above.

- 11) We go from Gross to Net Domestic Product by
- A) adding depreciation to GDP.
 - B) subtracting indirect business taxes from GDP.
 - C) adding indirect business taxes to GDP.
 - D) subtracting depreciation from GDP.

- 12) The inauguration of a new President often increases the degree of optimism in business firms and households, causing A_p to
- A) rise and IS to shift leftward.
 - B) fall and IS to shift leftward.
 - C) rise and IS to shift rightward.
 - D) fall and IS to increase.

- 13) Let the marginal leakage rate be 0.5 while the marginal propensity to consume is 0.8. Then a \$50 million reduction in autonomous taxes will cause autonomous consumption to _____ and equilibrium income to _____.
- A) fall by \$50 billion; fall by \$100 billion
 - B) rise by \$40 billion; rise by \$80 billion

- C) fall by \$40 billion; fall by \$200 billion
- D) rise by \$50 billion; rise by \$100 billion

14) The article on Donald Trump's 40% unemployment rate points out that the unemployment rate would be 53 percent if we were to include

- A) disabled
- B) children.
- C) retirees
- D) mothers raising children

15) The LM curve is the set of combinations of _____ such that _____.

- A) real income and real money balances, the production of output is equally demanded
- B) demanded real income and interest rates, the production of output is equally demanded
- C) interest rates and real money balances, real income equals real money balances times $(1/r)$
- D) interest rates and real money balances, the money supply is equally
- E) real income and interest rates, the money supply is equally demanded

16) The condition in circular-flow models whereby firms purchase all the goods not purchased by households is that

- A) investment equals saving.
- B) inventory investment is zero.
- C) consumption equals investment.
- D) fixed investment is zero.
- E) saving is zero.

17) Which of the following is NOT a leakage?

- A) import of a Toyota
- B) export of a Cadillac
- C) personal saving
- D) indirect business taxes

18) If total planned spending ($E(p)$) exceeds GDP, we expect that

- A) GDP will be falling.
- B) inventories will be rising.
- C) inventories will be falling.
- D) government expenditures must be rising.

19) The multiplier is defined as the ratio of a change in income to the

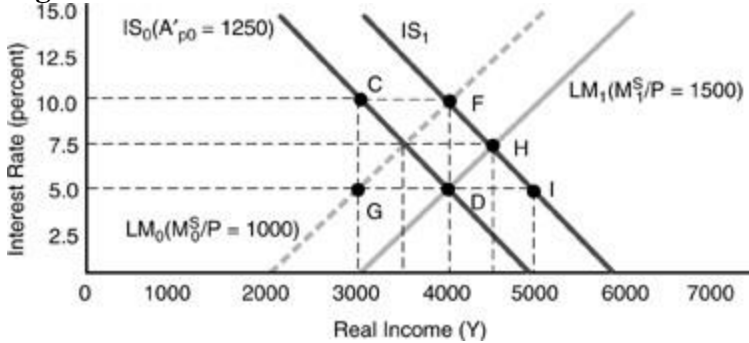
- A) marginal propensity to save.
- B) marginal propensity to consume.
- C) change in the marginal propensity to consume causing it.
- D) change in planned autonomous spending causing it.
- E) change in the marginal propensity to save causing it.

20) 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 right
- B) rises, the money demand schedule shifts to the left

- C) rises, we move downward along the money demand schedule
- D) falls, the money demand schedule shifts to the left
- E) falls, we move upward along the money demand schedule

Figure 2



21) Employing Figure 2 above, the initial equilibrium is point D and government expenditures increase by _____ shifting the IS curve from IS₀ to IS₁ and crowding out is approximately _____.

- A) 500, 500
- B) 250, 500
- C) 1000, 250
- D) 1000, 1000

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

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

23) Over the last 50 years

- A) On average the Federal funds rate has been higher than the 10-year Treasury bond rate
- B) On average the Federal funds rate has been equal to the 10-year Treasury bond rate
- C) On average the Federal funds rate has been lower than the 10-year Treasury bond rate
- D) Until 1995 the Federal funds rate was higher and since 1995 it has been lower

24) Suppose the demand for money becomes less sensitive to changes in the interest rate. In moving along an LM curve, an increase in income must be accompanied by a _____ change in the interest rate than before, meaning that the LM curve has become _____.

- A) smaller, flatter
- B) smaller, steeper
- C) greater, flatter
- D) greater, steeper

25) If the Fed's goal is to keep the interest rate fixed, a contractionary fiscal policy must be accompanied by _____ monetary policy that shifts the LM curve to the _____.

- A) an expansionary, right
- B) an expansionary, left
- C) a contractionary, right
- D) a contractionary, left

- 26) What does the 10-year Treasury Note (i.e., bond) have printed on the front of it?
- A) Fixed number of dollars
 - B) Fixed interest rate
 - C) Fixed number of dollars and variable interest rate
 - D) Variable number of dollars and fixed interest rate

- 27) If real GDP for a given year is \$2400 billion and nominal GDP is \$2400,
- A) the GDP deflator for this year is 1.10.
 - B) the GDP deflator for this year is 1.25.
 - C) the GDP deflator for this year is 0.8.
 - D) this year is the base year for the GDP deflator.

Table 1

	Year 1		Year 2	
	Quantity	Price	Quantity	Price
Apples	100	\$0.05	130	\$0.06
Peaches	300	\$0.03	270	\$0.04

- 28) Refer to above Table 1. What are the constant-dollar expenditures in years 1 and 2 at fixed year 1 prices?
- A) \$5.00, \$7.80
 - B) \$18.00, \$18.60
 - C) \$14.00, \$14.60
 - D) \$9.00, \$10.80
- 29) Suppose that equilibrium income is 3200 and the multiplier is 2.38. Equilibrium income would rise to 3400 if planned investment
- A) falls by 84.03.
 - B) falls by 476.
 - C) rises by 84.03.
 - D) rises by 476.
- 30) The business cycle expansion that ended in February 2020 lasted how many months?
- A) 32
 - B) 64
 - C) 128
 - D) 192

Multiple Choice Questions Solution

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

PART B: Analytic Problems

QUESTION 1 (4 points)

The following table summarizes GDP and the growth rate for two countries A and B in 2020:

	GDP	GDP growth (annual)
Country A	2000	2.5%
Country B	6000	1.0%

If both countries continue to grow at the same rate, which country will first reach a GDP level of at least 12000?

Show your work!

To reach a level of 12000, country A has to increase by six its GDP level, while country B has to double.
Time to increase by six country A: $\ln 6/0.025 = 71.67$ years
Time to double country B: $\ln 2/0.01 = 69.31$ years

Then, **country B** will first reach a GDP level of at least 12000

QUESTION 2 (4 points)

Nominal GDP of Fantasia was 1500 in 2020. Real GDP in 2020 using 2015 as base year was 1000. Using the GDP Deflator, what was the average annual inflation rate between 2015 and 2020?

GDP Deflator in 2020: $1500/1000 = 1.5$
Inflation rate between 2020 and 2015: $\ln(1.5/1) = 0.4055 = 40.55\%$
Annualized inflation rate = $40.55\%/5 = 8.11\%$

QUESTION 3 (10 points)

An economy only produces chips and cookies. The following table lists prices and production for the years 2020 and 2021:

	2020	2021
Prices		
Chips	10	7
Cookies	5	6
Quantities		
Chips	7	9
Cookies	11	12

a) What was nominal GDP for the years 2020 and 2021? (2 points)

	2020	2021
Nominal GDP	$10*7+5*11=125$	$7*9+6*12=135$

b) Calculate two indices for real GDP in 2021 if 2020 is normalized to 1 - one based on 2020 prices, and one based on 2021 prices. Mark your final answers clearly. (4 points)

Index for 2021 using 2020 prices	2021 in 2020 prices: $10*9+5*12=150$ Index = $150/125 = 1.2$
index for 2021 using 2021 prices	2020 in 2021 prices: $7*7+6*11= 115$ Index = $135/115 = 1.17$

c) Using (b), calculate the chain-weight index of real GDP in 2021 (if 2020 is normalized to 1). (2 points)

Chain-weight index of real GDP in 2021	$\text{sqrt}(1.2*1.17) = 1.18$
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d) Suppose chain weighted real GDP continues to grow at the same rate that it grew from 2020 to 2021. What will real GDP be in 2030? (2 points)

Chain weighted real GDP in 2030 (2020 as base year)	$100*\ln(1.18)= 16.55\%$ $125*\exp(16.55/100*10)= 654.13$
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QUESTION 4 (12 points)

Consider an economy characterized by the following goods market:

$$C = 200 + 0.5 (Y - T)$$

$$I = 150 - 5r$$

$$G = 200$$

$$T = 100$$

and the following money demand function:

$$\left(\frac{M}{P}\right)^d = 0.25Y - 0.5r$$

with $\frac{M^s}{P} = 235$.

a) Derive and graph the **IS curve** (2 points)

Equilibrium on goods market:

$$E_p = Y$$

where

$$E_p = C + I + G = 200 + 0.5(Y - T) + 150 - 5r + 200 = 500 + 0.5Y - 5r = Y$$

Hence IS curve $Y = 1000 - 10r$

b) What happens to the IS curve if G increases by $\Delta G = 100$ financed with a corresponding increase in T by $\Delta T = 100$? Why? (2 points)

(Hint: Does the slope of IS curve changes? Does such policy lead to the shift of IS curve?)

Since MPC is smaller than one, increase in G and T by the same amount lead to higher level of Y for every level of interest rate => IS curve shifts to the right

You can see that also by deriving new IS curve which is $Y = 1100 - 10r$

c) What happens to the IS curve if the **MPC suddenly jumps to 0.6**? Why? (2 points)

(Hint: Does the slope of IS curve changes? Does such policy lead to the shift of IS curve?)

As MPC increases change in r will lead to larger change in output => IS curve becomes flatter

You can see that also by deriving new IS curve which is $Y = 1225 - 12.5r$

Recall that IS curve has r on the Y axis, hence increase of coefficient from 10 to 12.5 in absolute value leads to flatter curve rather than steeper

d) Derive and graph the **LM curve**. (2 points)

Equilibrium on money market:

$$\left(\frac{M}{P}\right)^d = \frac{M^s}{P}$$

or

$$0.25Y - 0.5r = 235$$

Hence LM curve $Y = 940 + 2r$

e) Find the equilibrium values of Y and r . (2 points)

In equilibrium IS and LM curves intersect:

$$940 + 2r = 1000 - 10r$$

or

$$12r = 60$$

Hence equilibrium $r=5$ and $Y=950$

f) **The central bank wants to increase GDP by 20 by changing money supply.** What should be the new real money supply? (2 points)

New output is $Y=960$, hence new equilibrium r is :

$$970 = 1000 - 10r$$

or

$$r = 3$$

Hence equilibrium $r=3$ and $Y=970$. Therefore, new money supply is

$$242.5 - 1.5 = 241$$

Since money supply changes, LM curve will change as well and the equation for LM curve can not be used to compute new equilibrium interest rate. At the same time IS curve remains the same and is used to find new equilibrium interest rate.