

FINAL EXAMINATION VERSION B

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators, calculators with alphabetical keyboards, cell phones, and wireless devices are NOT permitted. Numerical answers, if rounded, must be correct to at least 3 significant digits. Point values for each question are noted in brackets. Maximum total points are 200.

I. Multiple choice: Please circle the one best answer to each question. [1 pt each, 22 pts total]

(1) “The government should provide a job for everyone who wants one” is an example of

- a. a positive statement.
- b. a normative statement.
- c. both of the above.
- d. none of the above.

(2) A *production function* shows the relationship between the

- a. quantity of input and the quantity of output.
- b. current level of output and the past level of output.
- c. level of output and the level of demand for output.
- d. price of output and the quantity produced.

(3) Barter is an unpopular method of trading because it

- a. is subject to higher taxes.
- b. requires that each party be able to offer a good that the other wants.
- c. is often illegal.
- d. causes both parties to lose.
- e. all of the above.

(4) Some people believe there is excess demand in the market for computers. If they are right, then the price of computers can be expected to

- a. rise.
- b. fall.
- c. remain constant.
- d. Price movements are not related to excess demand.

(5) Which of the following shows a strong upward trend for the U.S. over the last century?

- a. The unemployment rate.
- b. Real GDP per capita.
- c. The inflation rate.
- d. The interest rate.

(6) Interest rates and the money supply are components of

- a. monetary policy.
- b. international trade policy.
- c. fiscal policy.
- d. foreign policy.

(7) Government purchases in the national accounts do *not* include

- a. pay for members of the armed services.
- b. spending for social security benefits.
- c. spending on national parks.
- d. spending on highway construction.
- e. salaries of public school teachers.

(8) If a country's investment spending exceeds its national savings, then also its

- a. government spending exceeds its tax revenues.
- b. imports exceed its exports.
- c. consumption exceeds its income.
- d. unemployed workers exceed job vacancies.

(9) According to the aggregate production function, potential GDP is determined by all of the following except

- a. the size of the labor force.
- b. the size of the capital stock.
- c. business confidence
- d. technology.
- e. None of the above determine potential GDP.

- (10) The industrial revolution, which began in Britain, was accompanied by a dramatic increase in
- land input.
 - capital input.
 - labor input.
- (11) Unemployment caused by a recession is called
- structural unemployment.
 - frictional unemployment
 - cyclical unemployment.
 - all of the above.
- (12) Hyperinflation is caused by excessive
- taxes.
 - government borrowing.
 - government spending.
 - growth of the money supply.
 - consumption spending.
- (13) Most economists believe that business cycles are usually caused by fluctuations in
- the labor force.
 - the capital stock.
 - aggregate demand.
 - the population.
 - aggregate supply (that is, potential GDP).
- (14) According to Keynes, an increase in government purchases causes a further increase in
- the money supply.
 - the inflation rate.
 - consumption.
 - investment.
 - net exports.
- (15) A “price shock” is a rise in inflation
- that voters disapprove of.
 - that is unrelated to the output gap.
 - that is deliberately intended to get the economy moving again.
 - that is invisible to consumers.
- (16) “Quantitative easing” means
- gradual implementation of fiscal policy so as not to disturb markets.
 - lowering interest rates.
 - adjusting numbers to fit the problem at hand.
 - massive purchases of bonds by the central bank.
- (17) Suppose at the end of last year, the federal debt were \$30 trillion. Suppose this year the government ran a budget *surplus* of \$1 trillion. Then at the end of this year, the federal debt would be
- \$1 trillion.
 - \$29 trillion.
 - \$30 trillion.
 - \$31 trillion.
 - Cannot be determined.
- (18) If the federal budget is initially in deficit and a boom occurs, then that deficit will
- increase.
 - remain constant.
 - decrease or maybe become a surplus.
 - cannot be determined from information given.
- (19) Suppose the deficit is reduced by quickly increasing taxes or decreasing spending. This may, in the short run, cause
- a boom.
 - a recession.
 - a price shock.
 - a decrease in the money supply.
 - hyperinflation.
 - a price bubble.
- (20) Who sets monetary policy in the United States?
- The Federal Reserve Board of Governors.
 - The Federal Reserve District Banks.
 - The Federal Open Market Committee.
 - The Secretary of the Treasury.
 - The Federal Deposit Insurance Corporation.
 - The President.
 - The Senate Banking Committee.
- (21) A central bank that engages in countercyclical monetary policy raises interest rates when
- unemployment is less than the natural rate.
 - GDP is less than potential GDP.
 - imports are less than exports.
 - government spending is less than tax revenue.
- (22) Countries tend to have lower inflation rates in the long run if the heads of their central banks are
- directly elected by the people—who after all must live with the consequences of central bank policies.
 - under the direct control of elected officials and can be fired at any time.
 - more independent of elected officials.
 - cannot be determined from information given.

II. Problems: Insert your answer to each question in the box provided. Use margins and graphs for scratch work. Only the answers in the boxes will be graded. Work carefully—partial credit is not normally given for questions in this section.

(1) [Economic capital: 6 pts] Which of the following are examples of *economic capital*? Answer YES or NO.

a. Delivery trucks.

d. Checking accounts.

b. Fiber-optic cable networks.

e. Cellular phone towers.

c. Office buildings.

f. Shares of stock in corporations.

(2) [Shifts in demand and supply: 15 pts] Analyze each of the following markets according to the accompanying imaginary scenario.

a. Consider the market for **pizza**: The price of mozzarella cheese (an important ingredient in pizza) rises.

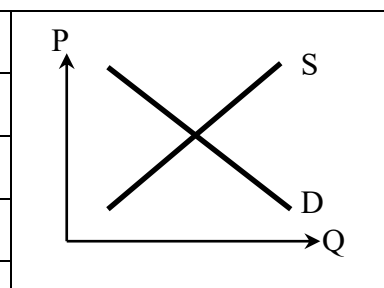
Does demand shift *left*, shift *right*, or remain *unchanged*?

Does supply shift *left*, shift *right*, or remain *unchanged*?

Does the equilibrium price *increase*, *decrease*, or *cannot be determined*?

Does the equilibrium quantity *increase*, *decrease*, or *cannot be determined*?

Sketch a graph of this scenario at right, showing which curve(s) shift(s).



b. Consider the market for **hotel rooms**: Suppose a recession lowers consumers' incomes.

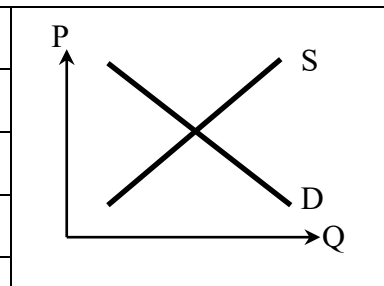
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Does supply shift *left*, shift *right*, or remain *unchanged*?

Does the equilibrium price *increase*, *decrease*, or *cannot be determined*?

Does the equilibrium quantity *increase*, *decrease*, or *cannot be determined*?

Sketch a graph of this scenario at right, showing which curve(s) shift(s).



c. Consider the market for **orange juice**: Suppose consumers begin shifting from fruit juices to water due to high sugar content in fruit juices. Simultaneously, a blight attacks orange trees.

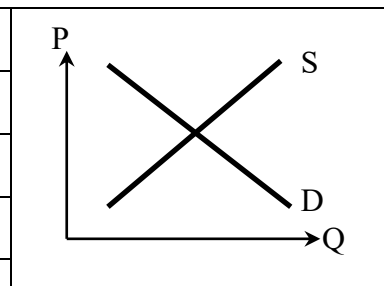
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Does supply shift *left*, shift *right*, or remain *unchanged*?

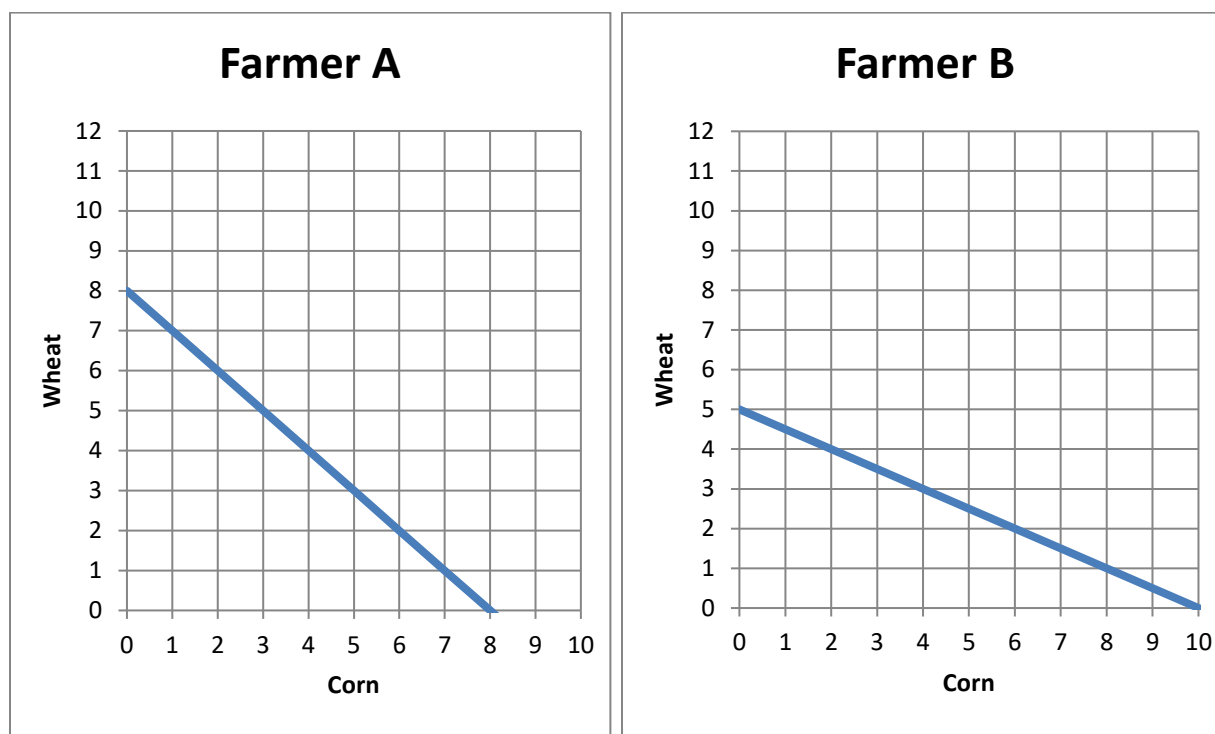
Does the equilibrium price *increase*, *decrease*, or *cannot be determined*?

Does the equilibrium quantity *increase*, *decrease*, or *cannot be determined*?

Sketch a graph of this scenario at right, showing which curve(s) shift(s).



(3) [Comparative advantage, gains from trade: 17 pts] Farmer A and Farmer B can each produce wheat and corn. They each face a tradeoff between these two crops because of limited land. Their production possibility curves are shown below.



- What is Farmer A's opportunity cost of producing a unit of corn?
- What is Farmer B's opportunity cost of producing a unit of corn?
- What is Farmer A's opportunity cost of producing a unit of wheat?
- What is Farmer B's opportunity cost of producing a unit of wheat?
- Which farmer has a comparative advantage in producing corn?
- Which farmer has a comparative advantage in producing wheat?

units of wheat
units of wheat
units of corn
units of corn

g. [3 pts] Fill in the blanks: *Both* farmers can consume combinations of crops *outside* their individual production possibility curves if _____ sends *two* units of wheat to _____, who sends _____ units of corn in return.

h. **Plot** the trade that you propose in part (g) on the graphs above. For each farmer, plot and label the starting point representing **production before trade**, and the ending point representing **consumption after trade**.

(4) [Spending approach to GDP: 12 pts] The table below shows data for the United States in a recent year as reported by the Bureau of Economic Analysis in trillions for a recent year. [Hint: Some of the data are extraneous and not needed for solving this problem.]

Residential investment	\$1.2
Consumption of durable goods	\$2.1
Corporate profits	\$3.2
Consumption of nondurable goods	\$3.9
Personal dividend income	\$1.8
Imports	\$4.0
National defense purchases	\$0.9
Federal nondefense purchases	\$0.7
Depreciation (capital consumption of domestic business)	\$2.8
Personal interest income	\$1.6
Change in inventories	\$0.2
Exports	\$3.0
State and local purchases	\$2.8
Compensation of employees	\$13.4
Transfer payments	\$4.0
Consumption of services	\$11.5
Business fixed investment	\$3.4

a. Compute consumption (C).

\$ trillion

b. Compute gross investment (I).

\$ trillion

c. Compute net investment.

\$ trillion

d. Compute government purchases (G).

\$ trillion

e. Does the U.S. have a trade surplus or a trade deficit ?

f. Compute net exports (X).

\$ trillion

(5) [GDP and real GDP: 8 pts] In an imaginary country, only two final goods are produced, as shown in the following table. (You can use the boxes at right for scratch work.)

Year	Food		Clothing		2024 prices	2025 prices
	Price	Quantity	Price	Quantity		
2024	\$5	10	\$4	50		
2025	\$5	16	\$9	50		

a. Compute the growth rate of *nominal GDP* (also called “current-dollar GDP”) from 2024 to 2025.

%

b. Compute the growth rate of GDP from 2024 to 2025 *in constant 2024 prices*.

%

c. Compute the growth rate of GDP from 2024 to 2025 *in constant 2025 prices*.

%

d. Compute the growth rate of *real GDP* from 2024 to 2025, as it would be computed by the U.S. Bureau of Economic Analysis.

%

(6) [Nominal GDP, real GDP, and inflation: 7 pts] The following table shows data for Mexico, in billions of *pesos*, the Mexican currency.

Year	Nominal GDP	Real GDP	GDP price index or price deflator (to the nearest tenth)	Rate of inflation (to the nearest tenth of a percentage point)
2016	20.8	23.3		
2017	22.5	23.7		%
2018	24.2	24.2		%

a. [2 pts] Which is the base year for real GDP?

b. [3 pts] Compute the GDP price index for each year, to the nearest tenth, and insert it in the table above. [Hint: The price index should equal 100.0 in the base year.]

c. [2 pts] Compute the rate of inflation for the last two years, to the nearest tenth of a percentage point, and insert in the table above.

(7) [Measuring the labor force: 8 pts] The U.S. Bureau of Labor Statistics reported the following data for December 2024. [Hint: Some of the data are extraneous and not needed for solving this problem.]

Employed persons working part time for economic reasons	4.4 million
New claims for unemployment insurance	0.4 million
Mean duration of unemployment	23.3 weeks
Not in labor force	101.1 million
Employed	161.6 million
Labor force	168.5 million
Job losers	3.3 million
Discouraged workers	0.5 million

a. Compute the number of unemployed people to the nearest tenth of a million.

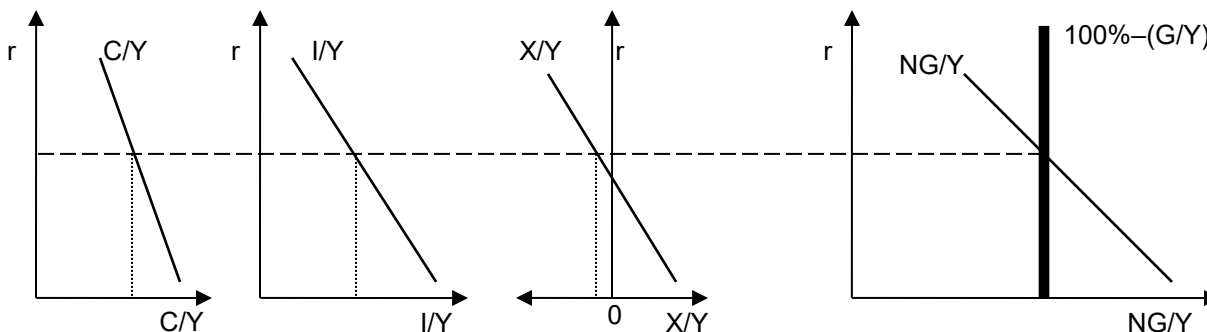
b. Compute the unemployment rate to the nearest tenth of a percentage point.

c. Compute the employment-to-population ratio to the nearest tenth of a percentage point.

d. Compute the labor force participation rate to the nearest tenth of a percentage point.

	million
	%
	%
	%

(8) [Interest rate and GDP shares—graph: 18 pts] Consider the following scenario. Suppose the stock market rises so that consumers feel more wealthy. Use the graphs below of the GDP spending shares model to answer the following questions.



- According to this scenario, which curve shifts: consumption's share (C/Y), investment's share (I/Y), net exports' share (X/Y), or the vertical line representing $100\%-(G/Y)$?
- Does it shift *left* or *right*?
- As a consequence, does the downward-sloping (NG/Y) curve shift *left*, shift *right*, or remain *unchanged*?
- Does the long-run real interest rate (r) *increase*, *decrease*, or remain *constant*?
- Does the share of consumption spending (C/Y) *increase*, *decrease*, or remain *constant*?
- Does the share of investment spending (I/Y) *increase*, *decrease*, or remain *constant*?
- Does the share of net exports (X/Y) *increase*, *decrease*, or remain *constant*?
- Which spending component—*consumption*, *investment*, *government purchases*, or *net exports*—directly affects potential GDP in the long run?
- Given your answer to (h), in this scenario, will long-run growth *increase*, *decrease*, or remain *constant*?

(9) [Technical change: 4 pts] In Canada over the period 1965 to 1990, the annual growth rate of output per worker was about 1.8%, and the annual growth rate of capital per worker was about 3.3%. Assume that the share of capital income plus depreciation in national income was about **(1/3)**, as it is in the United States.

- Compute the contribution of capital to productivity growth, to the nearest tenth of a percentage point.
- Compute the contribution of technology to productivity growth, also called the Solow residual, to the nearest tenth of a percentage point.

	%
	%

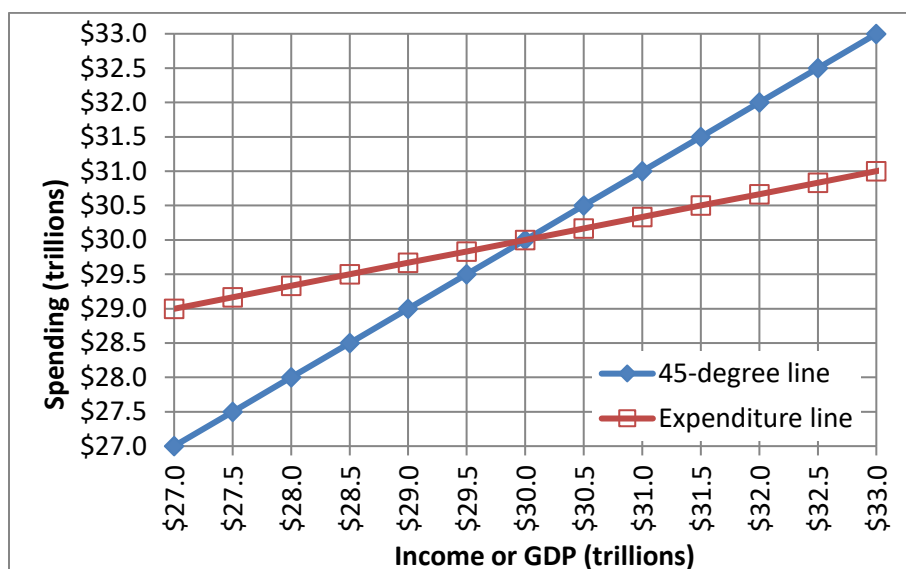
(10) [Quantity equation: 2 pts] Average annual growth rates for various items over the period 1960 to 1990 in the U.S. are reported below. [Hint: Some of the data are extraneous and not needed for this problem.]

Employment	1.6%
M2	7.0%
Consumer credit	7.4%
Real GDP	2.9%
Investment	3.8%

Assuming the velocity of money were constant, what should have been the average annual rate of inflation over this period, according to the quantity equation? Give an answer to the nearest tenth of a percentage point.

%

(11) [Keynesian cross, Keynesian multipliers: 12 pts] The following is a Keynesian cross diagram, including a 45-degree line and an expenditure line.



a. What is the current level of real GDP—that is, the point of "spending balance"?

\$ trillion

Suppose government purchases for defense spending *increase* by \$ 1 trillion.

b. Does the expenditure line shift *up* or *down* in the short run?

c. By how much (measured vertically)?

\$ trillion

d. Does GDP *increase* or *decrease* in the short run?

e. By how much?

\$ trillion

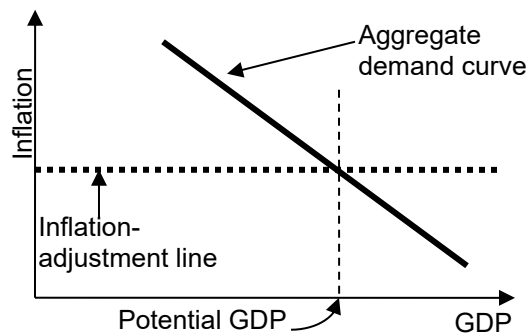
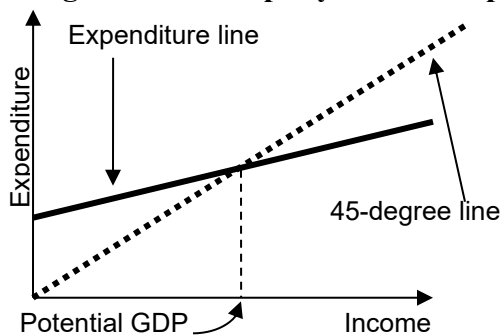
f. Compute the government-purchases multiplier from your previous answers to this problem.

(12) [How business cycles begin: 20 pts] Assume GDP initially equals potential GDP and consider the *short-run* consequences of each scenario in the left column. Indicate whether and how the scenario shifts the expenditure line in the Keynesian cross diagram. Then indicate whether and how it shifts the “aggregate demand” (AD) curve in the diagram used in Taylor and Weerapana’s textbook in the *short run*. Indicate whether the scenario is likely to cause a recession, a boom or neither (assuming GDP was initially equal to potential GDP).

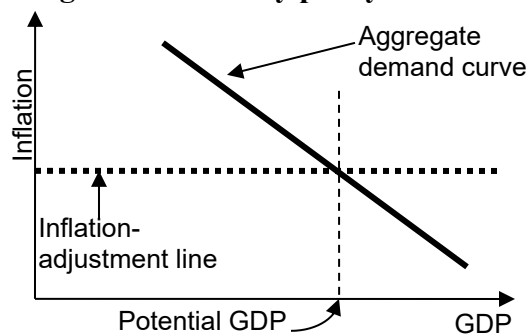
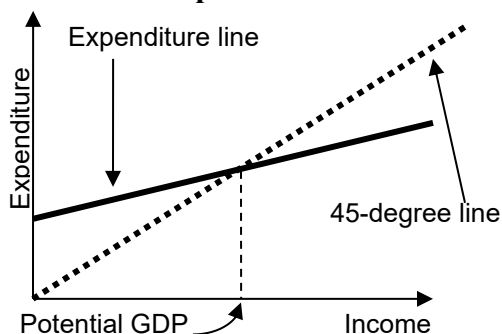
	Expenditure line shifts <i>up, down or unchanged?</i>	AD curve shifts <i>left, right, or unchanged?</i>	Causes <i>recession, boom, or neither?</i>
a. The government rapidly increases spending on defense.			
b. New leadership at the Federal Reserve decides to “tighten” monetary policy.			
c. Congress decides to cut taxes to fulfill a campaign promise.			
d. Business owners feel more confident about the future and increase investment spending.			

For each of these four scenarios, draw the shifts in curves on the next page.

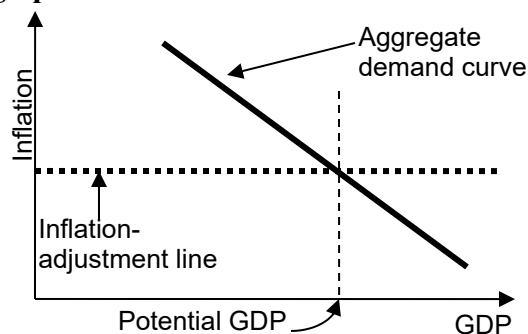
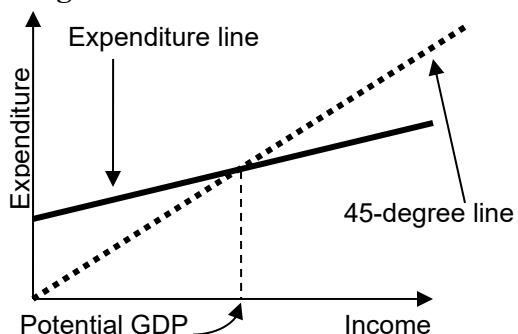
a. The government rapidly increases spending on defense.



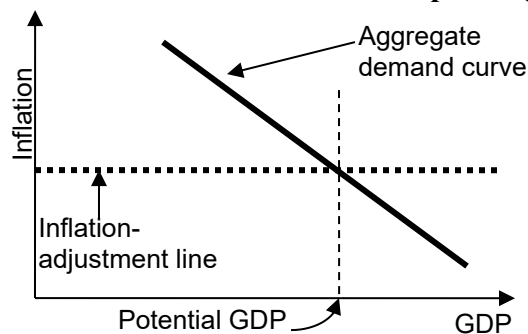
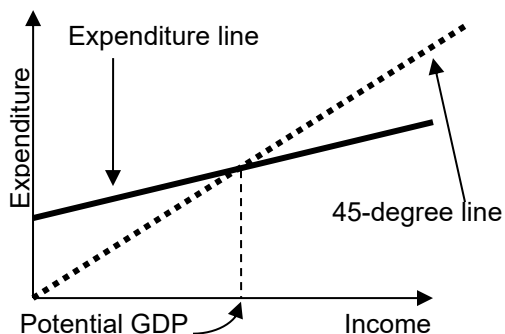
b. New leadership at the Federal Reserve decides to “tighten” monetary policy.



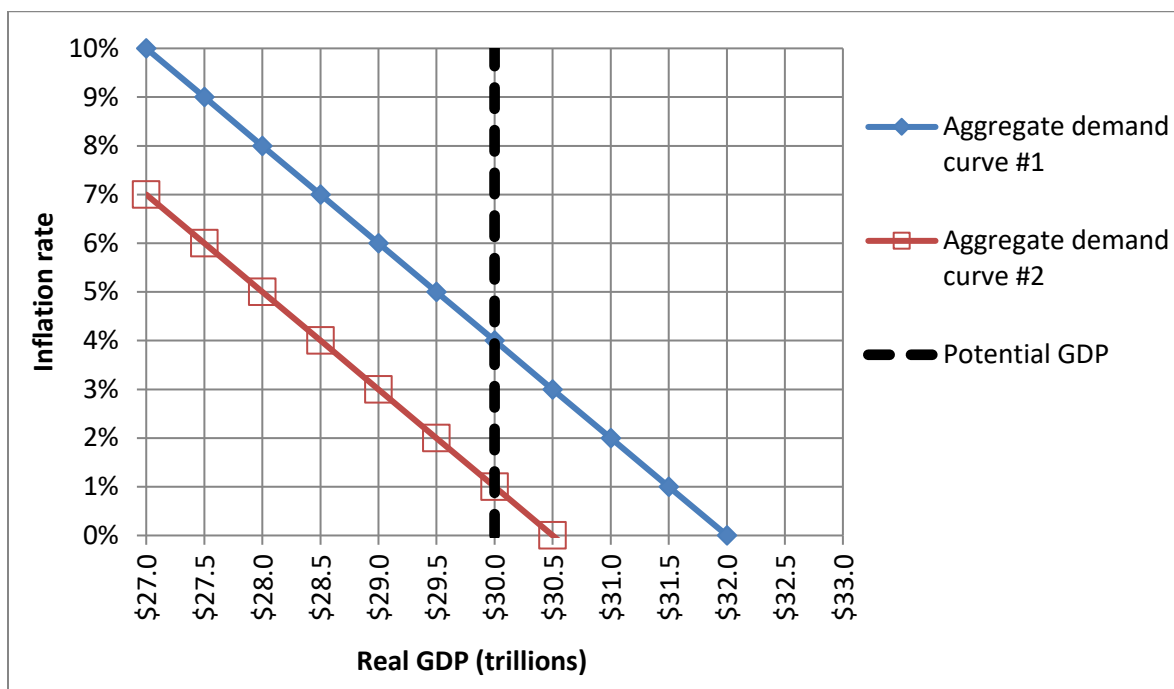
c. Congress decides to cut taxes to fulfill a campaign promise.



d. Business owners feel more confident about the future and increase investment spending.



(13) [Inflation adjustment: 16 pts] Consider the following graph of the macroeconomy, similar to those in the textbook by Taylor and Weerapana. Suppose that the aggregate demand curve is currently at "aggregate demand curve #1" and the inflation rate is currently 4%. [Hint: Begin by drawing the "inflation adjustment" line.]



a. What is the current level of real GDP?

\$	trillion

b. Is the unemployment rate currently *greater* than the natural rate, *less* than the natural rate, or *equal* to the natural rate of unemployment¹?

Now suppose the government passes a large tax increase and the aggregate demand curve shifts to "aggregate demand curve #2."

c. What is the level of real GDP in the short run?

\$	trillion

d. What is the inflation rate in the short run?

%	

e. Is the unemployment rate *greater* than the natural rate, *less* than the natural rate, or *equal* to the natural rate of unemployment in the short run?

f. What will be the level of real GDP in the long run?

\$	trillion

g. What will be the inflation rate in the long run?

%	

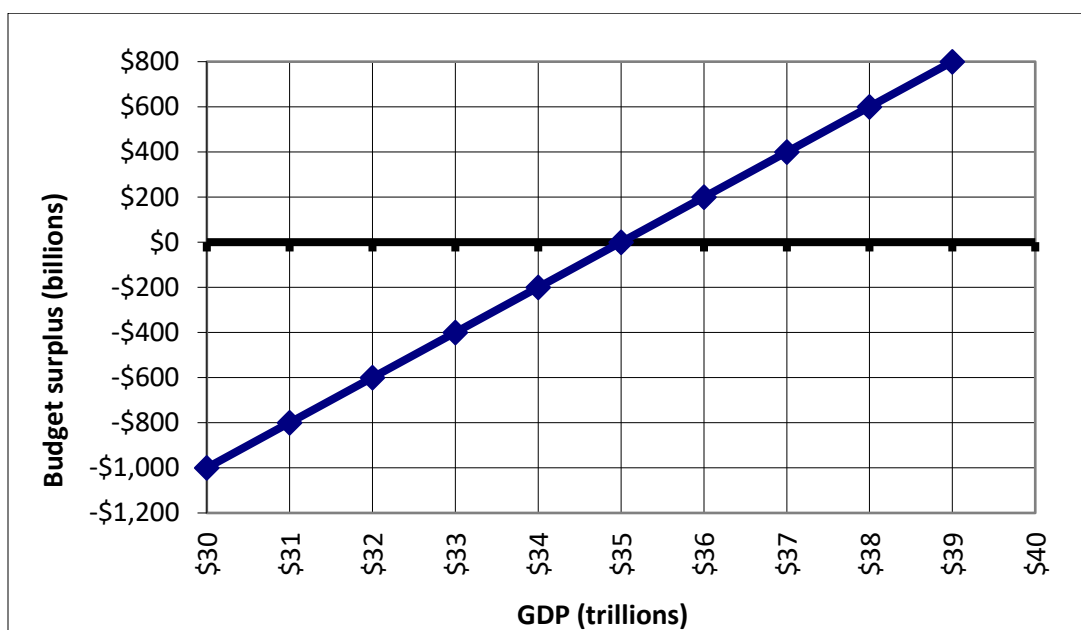
h. Is the unemployment rate *greater* than the natural rate, *less* than the natural rate, or *equal* to the natural rate of unemployment in the long run?

¹ Also called the "noncyclical rate of unemployment."

(14) [Fiscal policy: 6 pts] Indicate whether each item below represents a *discretionary policy* or an *automatic stabilizer*. If it is an automatic stabilizer, indicate whether it increases or decreases in a recession.

	<i>Discretionary policy or automatic stabilizer?</i>	<i>If an automatic stabilizer, does it increase or decrease in a recession?</i>
a. Tax revenues.		
b. Defense spending.		
c. Unemployment insurance benefits.		

(15) [Fiscal policy: 10 pts] The graph below shows the hypothetical relationship between the federal budget surplus (or deficit) and the level of GDP. Suppose potential GDP is \$34.0 trillion and actual level of GDP is \$33.0 trillion.



- Is the economy in a boom, a recession, or neither?
- Is there an actual budget surplus, an actual budget deficit, or an actual balanced budget?
- How much?
- Is there a structural budget surplus, a structural budget deficit, or a structural balanced budget?
- How much?

\$ billion
\$ billion

(16) [Monetary policy rule: 8 pts] Suppose the central bank follows the follows this monetary policy rule:

$$\text{Interest rate} = (\text{actual inflation} - 3\%) \times 0.5 + (\% \text{ output gap}) \times 0.5 + 3\%$$

Further, suppose actual inflation is 1% and real GDP is 2% *less* than potential GDP.

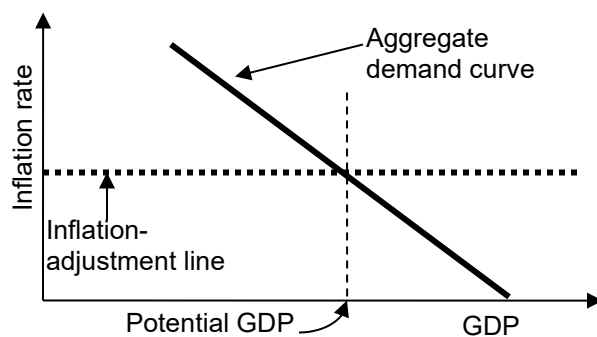
- What is the central bank's target rate of inflation?
- Is inflation *above* target, *below* target, or *exactly* at the target rate of inflation?
- Is the economy experiencing a *boom*, a *recession*, or *neither*?
- Using this monetary policy rule, what interest rate should the central bank set?

	%
	%

III. Critical thinking: Write a one-paragraph essay answering *one* question below (your choice). [4 pts]

- The model of Thomas Malthus predicts that output per worker will always return to the subsistence level—the so-called “iron law of wages.” What assumptions did Thomas Malthus make that turned out to be wrong? Give two and explain why they matter. (Ignore the graph.)
- For 2026, the federal budget deficit is about \$2 trillion and the money supply (M1) is about \$20 trillion. Suppose, hypothetically, the Federal Reserve created enough new money to pay for the budget deficit. Assume the growth rate of real GDP is about 2 percent. Predict the inflation rate using the quantity equation. Justify your answer. (Ignore the graph.)
- Suppose the U.S. experiences a boom due to a rightward shift in aggregate demand for some reason. To prevent inflation from rising, should Congress enact a *tax cut* or a *tax increase*? Why? Illustrate your verbal explanation using the graph below.

Please circle the question you are answering and write your answer below. Full credit requires correct economic reasoning, legible writing, good grammar including complete sentences, and accurate spelling.



[end of exam]