

Week 15

AP Macroeconomics

Homework bundle for this week

本周作业合集

exercises.lol

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4. Financial Sector

Starter Quiz · 课前小测

AP Macroeconomics

Name: _____ Score: _____

1. A bond is:
 - ☐ a loan that pays fixed interest and returns the principal
 - ☐ a share of ownership in a company
 - ☐ cash in a bank
 - ☐ a tax
2. The Fisher equation says the real interest rate approximately equals:
 - ☐ the nominal rate minus expected inflation
 - ☐ the nominal rate plus inflation
 - ☐ inflation minus the nominal rate
 - ☐ the nominal rate times inflation
3. Money used to pay for goods, avoiding barter, is acting as a:
 - ☐ medium of exchange
 - ☐ store of value
 - ☐ unit of account
 - ☐ commodity
4. The fraction of deposits a bank must keep rather than lend is the _____ ratio.

5. The demand for money slopes downward against the interest rate because:
 - ☐ the interest rate is the opportunity cost of holding cash
 - ☐ cash pays high interest
 - ☐ the government sets it
 - ☐ money is free
6. Expansionary monetary policy, used to fight a recession:
 - ☐ raises the money supply and lowers interest rates
 - ☐ lowers the money supply and raises interest rates
 - ☐ raises taxes
 - ☐ does nothing

7. A loan has a nominal rate of 6% and inflation turns out to be 5%. What is the real interest rate, in percent?

_____ percent

8. Select **all** three functions of money.

- ☐ medium of exchange
- ☐ store of value
- ☐ unit of account
- ☐ source of pollution

Tick every correct option.

9. The loanable funds market sets the _____ interest rate.

10. A bond pays 50 a year and its price falls to 500. What is its yield, in percent?

_____ percent

1. **a loan that pays fixed interest and returns the principal**

A bond is a loan; a stock is ownership; a deposit is money in a bank.

2. **the nominal rate minus expected inflation**

Real $\approx$ nominal — expected inflation — inflation is subtracted out.

3. **medium of exchange**

Accepting money in payment is the medium-of-exchange function.

4. **reserve**

The reserve ratio sets how much banks keep; the rest is lent out.

5. **the interest rate is the opportunity cost of holding cash**

When rates are high, holding cash costs more, so people hold less and buy bonds.

6. **raises the money supply and lowers interest rates**

More money and lower rates spur borrowing and spending, shifting AD right.

7. **1 percent**

Real rate = $6 - 5 = 1\%$.

8. **medium of exchange; store of value; unit of account**

Money is a medium of exchange, a store of value and a unit of account.

9. **real**

It sets the real rate for borrowing and lending over time.

10. **10 percent**

Yield = $50 \div 500 \times 100 = 10\%$.

4.1 Financial Assets

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

KEY WORDS bonds 债券 • financial asset 金融资产 • stocks 股票 • liquidity 流动性

Objective

Build the skills to answer exam questions on **financial assets**.

You must be able to:

- describe common **financial assets** 金融资产: stocks, bonds, and bank deposits
- explain the inverse relationship between a **bond's price** and its **interest rate** (yield)
- relate the **risk** and **return** of an asset to its **liquidity** 流动性

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ Financial assets

Stocks (part-ownership of a firm), **bonds** (loans that pay interest), and **bank deposits** (cash held at a bank).

■ Bond price and yield

A bond's price and its interest rate move in **opposite** directions: when market rates **rise**, the price of existing bonds **falls** (their fixed payments look less attractive).

■ Risk, return, liquidity

Higher **risk** usually brings higher **return**; a more **liquid** asset (easily turned into cash) usually offers a lower return.

2 Practice

2.1 Name three financial assets. [2]

2.2 State the relationship between a bond's price and interest rates. [1]

2.3 State the general link between an asset's risk and its return. [1]

3 Exam-style questions

3.1 When interest rates rise, the prices of existing bonds [1]

- **A** rise
- **B** fall
- **C** stay the same
- **D** double

3.2 A more liquid asset is one that is [1]

- **A** harder to sell
- **B** easily converted into cash
- **C** always riskier
- **D** always a stock

3.3 Interest rates in the economy rise.

(a) State the effect on the price of existing bonds. [1]

(b) Explain why. [2]

Solutions

2.1 any three of: stocks, bonds, bank deposits.

2.2 they move in opposite directions (an inverse relationship).

2.3 higher risk generally brings a higher return.

3.1 B.

3.2 B.

3.3 (a) it falls. (b) new bonds now pay the higher rate, so an old bond's fixed lower payments are worth less, and its price drops to match the new yield.

1. The economy of Micanapy is in short-run equilibrium and is experiencing an inflationary gap.

Part A

Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves for Micanapy, and show each of the following.

- The current equilibrium real output and price level, labeled Y_1 and PL_1 , respectively
- The full-employment real output, labeled Y_F

Part B

Assume that policymakers take no action to close the inflationary gap. Explain how Micanapy's economy will self-adjust to full employment in the long run.

Part C

Suppose instead that Micanapy's central bank is considering using monetary policy to close the inflationary gap in the short run. The banking system in Micanapy has limited reserves.

- Identify a specific open-market operation that the central bank of Micanapy would implement to close the inflationary gap in the short run.
- Draw a correctly labeled graph of the money market in Micanapy, and show the effect of the open-market operation identified in part C (i) on the nominal interest rate.

Part D

Based solely on the interest rate change shown on your graph in part C (ii), will each of the following increase, decrease, or remain the same in the short run?

- International financial capital flows into Micanapy. Explain.
- The price of previously issued bonds in Micanapy
- Private domestic investment spending in Micanapy

Part E

Based solely on the change in private domestic investment spending identified in part D (iii), will the unemployment rate in Micanapy increase, decrease, or remain the same in the short run? Explain.

2. Assume the economy of Jenland is in short-run equilibrium at a real output level above full-employment real output.

- The banking system in Jenland has ample reserves. Identify a specific monetary policy action that the central bank of Jenland would implement to return the economy to full employment in the short run.
- Draw a correctly labeled graph of the reserve market for Jenland, and show the effect of the central bank's action identified in part A on the policy rate.
- Based on the change in the interest rate shown on your graph in part B, will each of the following increase, decrease, or remain the same in Jenland in the short run?
 - The price of previously issued bonds
 - The price level. Explain.

1. The economy of Alpha is in short-run equilibrium with a cyclical unemployment rate of 3%, a frictional unemployment rate of 4%, and an actual unemployment rate of 8%.

(a) Calculate Alpha's natural rate of unemployment. Show your work.

(b) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves for Alpha, and show each of the following.

- The current equilibrium output and price level, labeled Y_1 and PL_1 , respectively
- The full-employment output, labeled Y_F

(c) Assume that policymakers take no action to close the output gap.

- Explain how Alpha's economy will adjust to full employment in the long run.
- On your graph in part (b), show how Alpha's economy will adjust to full employment in the long run, labeling the new equilibrium price level PL_2 .

(d) Assume instead that Alpha's central bank is considering using monetary policy to close a recessionary output gap. The banking system in Alpha has ample reserves. Identify a specific monetary policy action the central bank of Alpha would take to close the output gap in the short run.

(e) Draw a correctly labeled graph of the reserve market in Alpha, and show the effect of the action taken by the central bank identified in part (d) on the policy rate.

(f) Based on the change in the policy rate shown in part (e), what would happen to each of the following in the short run in Alpha?

- The price of previously issued bonds
- The price level. Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

1. Assume the economy of Vanderlandia is in short-run equilibrium with a real GDP of \$500 million. The full-employment level of real GDP is \$550 million.
- (a) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, and show each of the following.
- (i) The current equilibrium real output and price level, labeled Y_1 and PL_1 , respectively
 - (ii) The full-employment output, labeled Y_F
- (b) Assume no policy action is taken to restore full employment.
- (i) Explain how the economy will adjust in the long run.
 - (ii) Following the long-run adjustment process, will the price level in Vanderlandia be greater than, less than, or equal to PL_1 shown on your graph in part (a)?
- (c) Assume instead that policymakers in Vanderlandia are considering changing government spending to restore full employment in the short run and that the marginal propensity to save is 0.2.
- (i) Calculate the minimum change and state the direction of change in government spending required to completely close the output gap in the short run. Show your work.
 - (ii) On your graph in part (a), show the short-run effect of the change in government spending in part (c)(i), labeling the new equilibrium price level PL_2 .
- (d) Draw a correctly labeled graph of the loanable funds market, and show the effect of the change in government spending in part (c)(i) on the equilibrium real interest rate.
- (e) Based on the change in the real interest rate shown on your graph in part (d), what will happen to each of the following?
- (i) The price of previously issued bonds
 - (ii) The rate of economic growth in the long run. Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

1. Assume the United States economy is in short-run macroeconomic equilibrium at an output level greater than potential output.
- (a) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, and show each of the following.
- (i) The current equilibrium real output and price level, labeled as Y_1 and PL_1 , respectively
 - (ii) The full-employment output, labeled as Y_F
- (b) Assume government spending increases by \$100 billion. On your graph in part (a), show the short-run effect of the change in government spending on the equilibrium real output and price level. Label the new equilibrium output as Y_2 and the new equilibrium price level as PL_2 .
- (c) Assume the marginal propensity to consume is 0.8. As a result of the increase in government spending, what is the numerical value of the maximum change in each of the following in the short run?
- (i) Real output
 - (ii) Household savings
- (d) Draw a correctly labeled graph of the money market and show the effect of the change in real output identified in part (c)(i) on the equilibrium nominal interest rate.
- (e) Based on the change in the nominal interest rate shown in part (d), what will happen to the prices of previously issued bonds in the short run?
- (f) The United States and the European Union are trading partners with flexible exchange rates. The currency in the United States is the dollar, and the currency in the European Union is the euro. Assume the inflation rate in the United States increases relative to the inflation rate in the European Union. As a result of the change in the United States inflation rate, what will happen to each of the following in the foreign exchange market?
- (i) The demand for dollars. Explain.
 - (ii) The international value of the dollar
- (g) Suppose the Federal Reserve attempts to keep the value of the dollar constant in the foreign exchange market. Based on the change in the value of the dollar in part (f)(ii), should the Federal Reserve buy or sell each of the following?
- (i) The euro
 - (ii) The dollar

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

2. Assume that an economy is in long-run equilibrium. Assume that consumers wish to hold less money because they use credit cards more frequently to purchase goods and services than cash.
- (a) Draw a correctly labeled graph of the money market and show the effect of the reduced holdings of money on the equilibrium nominal interest rate in the short run.
 - (b) Based on the change in the interest rate in part (a), what will happen to each of the following in the short run?
 - (i) Prices of previously issued bonds
 - (ii) The price level and real income. Explain.
 - (c) With a constant money supply, based on your answer to part b(ii), will the velocity of money increase, decrease, or remain the same, or is the change indeterminate?
 - (d) If the central bank wishes to reverse the change in the interest rate identified in part (a), what open market operation would it use?

2. The Federal Reserve can influence the supply of money.
- (a) Assume that the Federal Reserve targets a lower federal funds rate.
 - (i) What open market operation can the Federal Reserve use to achieve the lower target?
 - (ii) Given your answer to part (a)(i), what will happen to the price of government bonds?
 - (b) Using a correctly labeled graph of the money market, show the effect of the open market operation from part (a)(i) on the nominal interest rate.
 - (c) Assume that the Federal Reserve buys government bonds from commercial banks. Based only on this transaction, will the level of required reserves in the commercial banks increase, decrease, or remain the same?
 - (d) Another monetary policy action involves changing the discount rate. Define the discount rate.

4.2 Nominal v. Real Interest Rates

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

KEY WORDS nominal interest rate 名义利率 • real interest rate 实际利率
• fisher equation 费雪方程

Objective

Build the skills to answer exam questions on **nominal versus real interest rates**.

You must be able to:

- distinguish the **nominal interest rate** 名义利率 from the **real interest rate** 实际利率
- apply the **Fisher equation** 费雪方程: $\text{real rate} \approx \text{nominal rate} - \text{expected inflation}$
- explain how expected inflation affects borrowers and lenders

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ Nominal vs real

The **nominal** rate is the stated rate; the **real** rate is what is left after allowing for inflation — the true change in purchasing power.

■ The Fisher equation

$$\text{real rate} \approx \text{nominal rate} - \text{expected inflation.}$$

■ Borrowers and lenders

If inflation turns out **higher** than expected, the real rate actually paid is **lower**, so **borrowers gain** and **lenders lose**.

2 Practice

2.1 State the Fisher equation. [1]

2.2 A loan has a nominal rate of 7% and expected inflation is 3%. Find the real rate. [2]

2.3 State the difference between a nominal and a real interest rate. [1]

3 Exam-style questions

3.1 The real interest rate equals the nominal rate [1]

- **A** plus expected inflation
- **B** minus expected inflation
- **C** times inflation
- **D** divided by inflation

3.2 If inflation is higher than expected, the real rate actually paid by a borrower is [1]

- **A** higher
- **B** lower
- **C** unchanged
- **D** zero

3.3 A loan has a nominal rate of 8%; expected inflation is 5%.

(a) Find the expected real interest rate. [2]

(b) If actual inflation turns out to be 9%, state who gains. [1]

Solutions

2.1 real rate $\approx$ nominal rate $-$ expected inflation.

2.2 $7\% - 3\% = 4\%$.

2.3 the nominal rate is the stated rate; the real rate subtracts inflation to give the true change in purchasing power.

3.1 B.

3.2 B.

3.3 (a) $8\% - 5\% = 3\%$. (b) the borrower gains (actual real rate is only $8\% - 9\% = -1\%$).

1. The economy of Micanapy is in short-run equilibrium and is experiencing an inflationary gap.

Part A

Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves for Micanapy, and show each of the following.

- The current equilibrium real output and price level, labeled Y_1 and PL_1 , respectively
- The full-employment real output, labeled Y_F

Part B

Assume that policymakers take no action to close the inflationary gap. Explain how Micanapy's economy will self-adjust to full employment in the long run.

Part C

Suppose instead that Micanapy's central bank is considering using monetary policy to close the inflationary gap in the short run. The banking system in Micanapy has limited reserves.

- Identify a specific open-market operation that the central bank of Micanapy would implement to close the inflationary gap in the short run.
- Draw a correctly labeled graph of the money market in Micanapy, and show the effect of the open-market operation identified in part C (i) on the nominal interest rate.

Part D

Based solely on the interest rate change shown on your graph in part C (ii), will each of the following increase, decrease, or remain the same in the short run?

- International financial capital flows into Micanapy. Explain.
- The price of previously issued bonds in Micanapy
- Private domestic investment spending in Micanapy

Part E

Based solely on the change in private domestic investment spending identified in part D (iii), will the unemployment rate in Micanapy increase, decrease, or remain the same in the short run? Explain.

1. The economy of Alpha is in short-run equilibrium with a cyclical unemployment rate of 3%, a frictional unemployment rate of 4%, and an actual unemployment rate of 8%.

(a) Calculate Alpha's natural rate of unemployment. Show your work.

(b) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves for Alpha, and show each of the following.

- The current equilibrium output and price level, labeled Y_1 and PL_1 , respectively
- The full-employment output, labeled Y_F

(c) Assume that policymakers take no action to close the output gap.

- Explain how Alpha's economy will adjust to full employment in the long run.
- On your graph in part (b), show how Alpha's economy will adjust to full employment in the long run, labeling the new equilibrium price level PL_2 .

(d) Assume instead that Alpha's central bank is considering using monetary policy to close a recessionary output gap. The banking system in Alpha has ample reserves. Identify a specific monetary policy action the central bank of Alpha would take to close the output gap in the short run.

(e) Draw a correctly labeled graph of the reserve market in Alpha, and show the effect of the action taken by the central bank identified in part (d) on the policy rate.

(f) Based on the change in the policy rate shown in part (e), what would happen to each of the following in the short run in Alpha?

- The price of previously issued bonds
- The price level. Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

1. Assume the United States economy is in short-run macroeconomic equilibrium at an output level greater than potential output.
- (a) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, and show each of the following.
- (i) The current equilibrium real output and price level, labeled as Y_1 and PL_1 , respectively
 - (ii) The full-employment output, labeled as Y_F
- (b) Assume government spending increases by \$100 billion. On your graph in part (a), show the short-run effect of the change in government spending on the equilibrium real output and price level. Label the new equilibrium output as Y_2 and the new equilibrium price level as PL_2 .
- (c) Assume the marginal propensity to consume is 0.8. As a result of the increase in government spending, what is the numerical value of the maximum change in each of the following in the short run?
- (i) Real output
 - (ii) Household savings
- (d) Draw a correctly labeled graph of the money market and show the effect of the change in real output identified in part (c)(i) on the equilibrium nominal interest rate.
- (e) Based on the change in the nominal interest rate shown in part (d), what will happen to the prices of previously issued bonds in the short run?
- (f) The United States and the European Union are trading partners with flexible exchange rates. The currency in the United States is the dollar, and the currency in the European Union is the euro. Assume the inflation rate in the United States increases relative to the inflation rate in the European Union. As a result of the change in the United States inflation rate, what will happen to each of the following in the foreign exchange market?
- (i) The demand for dollars. Explain.
 - (ii) The international value of the dollar
- (g) Suppose the Federal Reserve attempts to keep the value of the dollar constant in the foreign exchange market. Based on the change in the value of the dollar in part (f)(ii), should the Federal Reserve buy or sell each of the following?
- (i) The euro
 - (ii) The dollar

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

1. Assume Smithland is in short-run equilibrium at a level of output that exceeds the full-employment level of output.
- (a) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, and show each of the following.
- (i) The current equilibrium real output and price level, labeled Y_1 and PL_1 , respectively
 - (ii) The full-employment output, labeled Y_F
- (b) Assume Smithland's government cuts individual income taxes. On your graph in part (a), show the short-run effect of the tax cut on equilibrium real output, labeling the new short-run equilibrium real output Y_2 .
- (c) Based solely on the change in real output on your graph in part (b), what will happen to each of the following in the short run?
- (i) The natural rate of unemployment
 - (ii) Nominal interest rates. Explain.
- (d) Assume instead the central bank intervenes to correct an inflationary output gap. What open-market operation should the central bank take?
- (e) Draw a correctly labeled graph of the money market, and show the effect of the open-market operation identified in part (d) on the nominal interest rate.
- (f) Based solely on the interest rate change identified in part (e), what will happen to the international value of Smithland's currency in the foreign exchange market? Explain.
- (g) Based solely on the exchange rate change identified in part (f), will Smithland's imports increase, decrease, or remain the same? Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

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2. Assume that an economy is in long-run equilibrium. Assume that consumers wish to hold less money because they use credit cards more frequently to purchase goods and services than cash.
- (a) Draw a correctly labeled graph of the money market and show the effect of the reduced holdings of money on the equilibrium nominal interest rate in the short run.
- (b) Based on the change in the interest rate in part (a), what will happen to each of the following in the short run?
- (i) Prices of previously issued bonds
 - (ii) The price level and real income. Explain.
- (c) With a constant money supply, based on your answer to part b(ii), will the velocity of money increase, decrease, or remain the same, or is the change indeterminate?
- (d) If the central bank wishes to reverse the change in the interest rate identified in part (a), what open market operation would it use?

MACROECONOMICS**Section II****Total Time—60 minutes****Reading Period—10 minutes****Writing Period—50 minutes**

Directions: You are advised to spend the first 10 minutes reading all of the questions and planning your answers. You will then have 50 minutes to answer all three of the following questions. You may begin writing your responses before the reading period is over. It is suggested that you spend approximately half your time on the first question and divide the remaining time equally between the next two questions. Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. Use a pen with black or dark blue ink.

1. Assume that the United States economy is currently in a short-run equilibrium with the actual unemployment rate above the natural rate of unemployment.
 - (a) Draw a single correctly labeled graph with both the long-run Phillips curve and short-run Phillips curve. Label the current short-run equilibrium point P.
 - (b) Assuming no policy actions are taken, will the short-run Phillips curve shift to the right (upward), shift to the left (downward), or remain the same in the long run? Explain.
 - (c) If the Federal Reserve Bank wants to lower unemployment, what expansionary open-market operation should it use?
 - (d) How will the open-market operation you identified in part (c) affect each of the following?
 - (i) Federal funds rate. Explain.
 - (ii) Real interest rate in the short run.
 - (e) Given your answer in part (d)(ii), what is the effect on real gross domestic product (GDP) in the short run? Explain.
 - (f) Japan and the United States are major trading partners. Indicate how the change in real GDP you identified in part (e) will affect the demand for the Japanese yen in the foreign exchange market.
 - (g) Draw a correctly labeled graph of the foreign exchange market for the Japanese yen, showing the effect of the change in demand identified in part (f) on the value of the Japanese yen relative to the United States dollar.

**AP MACROECONOMICS • EXERCISE SHEET**

4.3 Definition, Measurement, and Functions of Money

Name: _____ Class: _____ Date: _____ **Total: 10 marks**

KEY WORDS unit of account 记账单位 • fiat money 法定货币 • functions of money 货币的职能
 • medium of exchange 交换媒介 • store of value 价值储藏

Objective

Build the skills to answer exam questions on **the definition, measurement, and functions of money**.

You must be able to:

- state the three **functions of money** 货币的职能: medium of exchange, store of value, unit of account
- compare the money-supply measures **M1** and **M2** by liquidity
- distinguish **commodity money** 商品货币 from **fiat money** 法定货币

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ Three functions of money

- **Medium of exchange** — accepted in trade.
- **Store of value** — holds worth over time.
- **Unit of account** — a common measure of prices.

■ M1 and M2

M1 is the most liquid (cash and chequing deposits); **M2** adds slightly less liquid savings and small time deposits.

■ Commodity vs fiat

Commodity money has intrinsic value (e.g. gold); **fiat money** has value because the government declares it legal tender.

2 Practice

2.1 State the three functions of money. [2]

2.2 State which is more liquid, M1 or M2. [1]

2.3 State the difference between commodity money and fiat money. [2]

3 Exam-style questions

3.1 Using money as a “unit of account” means it is used to [1]

- A store wealth over time
- B measure and compare prices
- C earn interest
- D back the currency with gold

3.2 Fiat money has value because [1]

- A it is made of gold
- B the government declares it legal tender
- C it is naturally rare
- D it earns interest

3.3 A shopkeeper prices goods, accepts cash for them, and keeps takings in a savings account.

(a) Name the money function used in **pricing** goods. [1]

(b) Name the function used in **accepting cash**. [1]

(c) Name the function used in **saving**. [1]

Solutions

2.1 medium of exchange, store of value, unit of account.

2.2 M1.

2.3 commodity money has intrinsic value of its own; fiat money has value only because the government declares it legal tender.

3.1 B.

3.2 B.

3.3 (a) unit of account. (b) medium of exchange. (c) store of value.

AP MACROECONOMICS • EXERCISE SHEET

4.4 Banking and the Expansion of the Money Supply

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

KEY WORDS required reserves 法定准备金 • money multiplier 货币乘数
• fractional reserve banking 部分准备金银行 • fractional reserve 部分准备金
• excess reserves 超额准备金

Objective

Build the skills to answer exam questions on **banking and the expansion of the money supply**.

You must be able to:

- explain **fractional reserve banking** 部分准备金银行 and the role of **required reserves** 法定准备金
- use the **money multiplier** 货币乘数 $\left(\frac{1}{\text{reserve ratio}}\right)$
- trace how a new deposit expands the money supply

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ Fractional reserve banking

A bank keeps only a **fraction** of deposits as **required reserves** and lends out the rest.

■ The money multiplier

$$\text{money multiplier} = \frac{1}{\text{reserve ratio}}.$$

■ Deposit expansion

A new deposit is lent, spent, re-deposited, lent again... so the money supply grows by up to (deposit $\times$ multiplier). With a reserve ratio of 0.10, the multiplier is 10.

2 Practice

2.1 State what fractional reserve banking means. [1]

2.2 The reserve ratio is 0.20. Find the money multiplier. [2]

2.3 State what happens to the money supply when a bank lends out its excess reserves.[1]

3 Exam-style questions

3.1 The money multiplier is [1]

- A the reserve ratio
- B $\frac{1}{\text{reserve ratio}}$
- C $1 - \text{reserve ratio}$
- D $(\text{reserve ratio})^2$

3.2 A lower reserve requirement makes the money multiplier [1]

- A smaller
- B larger
- C zero
- D negative

3.3 The reserve ratio is 0.10 and a new \$2000 deposit is made.

(a) Find the money multiplier. [1]

(b) Find the maximum increase in the money supply. [2]

Solutions

2.1 banks keep only a fraction of deposits as reserves and lend the rest.

2.2 $\frac{1}{0.20} = 5$.

2.3 it increases (the loans become new deposits elsewhere).

3.1 B.

3.2 B.

3.3 (a) $\frac{1}{0.10} = 10$. (b) $2000 \times 10 = \$20\,000$.

Name:

AP Macroeconomics: 2022 Set 1

2. Assume that commercial banks must hold a minimum of 20% of their deposits as reserves. Now suppose that the central bank of the country sells \$100,000 of government bonds to commercial banks.

(a) Calculate the maximum change and state the direction of change in the money supply as a result of the central bank bond sale. Show your work.

(b) Draw a correctly labeled graph of the money market and show the effect of the change in the money supply identified in part (a) on the nominal interest rate.

(c) Given the change in the money supply in part (a), if the velocity of money is constant, what will happen to the nominal gross domestic product? Explain.

(d) Based on the change in the nominal gross domestic product in part (c), what happens to the price level if the real gross domestic product is constant?

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

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2. The following is the balance sheet of First Superior Bank.

Assets		Liabilities and Equity	
Reserves	\$200	Demand deposits	\$2,000
Loans	\$1,800	Equity (net worth)	\$0

Assume that the required reserve ratio is 10 percent.

(a) What is the dollar value of new loans that First Superior Bank can make? Explain.

(b) Mr. Smith deposits \$100 of cash in a demand deposit account in First Superior Bank. Calculate the maximum amount of new loans that First Superior Bank can now make.

(c) As a result of Mr. Smith's \$100 cash deposit, calculate the maximum change over time in each of the following in the banking system.

(i) Loans

(ii) Demand deposits

(d) As a result of Mr. Smith's \$100 cash deposit, calculate the maximum change over time in the money supply.

(e) Provide one reason why the actual change in money supply can be smaller than the maximum change you identified in part (d).

2. The Federal Reserve can influence the supply of money.

- (a) Assume that the Federal Reserve targets a lower federal funds rate.
 - (i) What open market operation can the Federal Reserve use to achieve the lower target?
 - (ii) Given your answer to part (a)(i), what will happen to the price of government bonds?
- (b) Using a correctly labeled graph of the money market, show the effect of the open market operation from part (a)(i) on the nominal interest rate.
- (c) Assume that the Federal Reserve buys government bonds from commercial banks. Based only on this transaction, will the level of required reserves in the commercial banks increase, decrease, or remain the same?
- (d) Another monetary policy action involves changing the discount rate. Define the discount rate.

AP MACROECONOMICS • EXERCISE SHEET

4.5 The Money Market

Name: _____ Class: _____ Date: _____

Total: 8 marks

KEY WORDS money market 货币市场 • money supply 货币供给 • demand for money 货币需求
 • money 货币 • nominal interest rate 名义利率

Objective

Build the skills to answer exam questions on **the money market**.

You must be able to:

- describe the **demand for money** 货币需求 as downward-sloping in the nominal interest rate
- treat the **money supply** 货币供给 as set by the central bank (vertical)
- determine the **equilibrium nominal interest rate** and analyse shifts

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ Money demand

The demand for money slopes **downward** in the nominal interest rate: a higher rate is a bigger opportunity cost of holding cash, so people hold **less**.

■ Money supply

Set by the **central bank**, so it is drawn **vertical** (independent of the interest rate).

■ Equilibrium

Where money demand meets money supply — this fixes the equilibrium **nominal interest rate**. More money supply → lower rate.

2 Practice

2.1 State why the demand for money slopes downward.

[1]

2.2 State the shape of the money-supply curve, and why. [1]

2.3 State what happens to the interest rate if the central bank increases the money supply. [1]

3 Exam-style questions

3.1 The money-supply curve is [1]

- **A** upward-sloping
- **B** downward-sloping
- **C** vertical
- **D** horizontal

3.2 An increase in the money supply lowers the [1]

- **A** price level directly
- **B** nominal interest rate
- **C** real GDP directly
- **D** reserve ratio

3.3 The central bank increases the money supply.

(a) State the effect on the nominal interest rate. [1]

(b) State the effect on investment spending. [1]

(c) State the effect on aggregate demand. [1]

Solutions

2.1 a higher interest rate raises the opportunity cost of holding money, so less is demanded.

2.2 vertical, because it is set by the central bank regardless of the interest rate.

2.3 it falls.

3.1 C.

3.2 B.

3.3 (a) it falls. (b) investment rises. (c) AD rises.

1. The economy of Micanapy is in short-run equilibrium and is experiencing an inflationary gap.

Part A

Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves for Micanapy, and show each of the following.

- i. The current equilibrium real output and price level, labeled Y_1 and PL_1 , respectively
- ii. The full-employment real output, labeled Y_F

Part B

Assume that policymakers take no action to close the inflationary gap. Explain how Micanapy's economy will self-adjust to full employment in the long run.

Part C

Suppose instead that Micanapy's central bank is considering using monetary policy to close the inflationary gap in the short run. The banking system in Micanapy has limited reserves.

- i. Identify a specific open-market operation that the central bank of Micanapy would implement to close the inflationary gap in the short run.
- ii. Draw a correctly labeled graph of the money market in Micanapy, and show the effect of the open-market operation identified in part C (i) on the nominal interest rate.

Part D

Based solely on the interest rate change shown on your graph in part C (ii), will each of the following increase, decrease, or remain the same in the short run?

- i. International financial capital flows into Micanapy. Explain.
- ii. The price of previously issued bonds in Micanapy
- iii. Private domestic investment spending in Micanapy

Part E

Based solely on the change in private domestic investment spending identified in part D (iii), will the unemployment rate in Micanapy increase, decrease, or remain the same in the short run? Explain.

2. The economies of Country L and Country A are currently in short-run equilibrium at output levels below full employment. Both countries intend to use monetary policy to close their output gaps. Country L has a banking system with limited reserves, and Country A has a banking system with ample reserves.

- A. What open-market operation would Country L implement to move the economy toward full employment in the short run?
- B. What specific monetary policy action would Country A implement to move the economy toward full employment in the short run?
- C. Draw a correctly labeled graph of the reserve market in Country A, and show the effect of the monetary policy action identified in part B on the policy rate.
- D. Assume instead that no policy actions are taken in Country A and that the economy remains in short-run equilibrium at an output level below full employment. Will short-run aggregate supply in Country A increase, decrease, or remain the same as the economy self-adjusts in the long run? Explain.



2. The table provided shows economic data for the country of Louland. The base year is year 1, and the GDP deflator in year 2 is 115.

	Year 1	Year 2
Nominal GDP	800,000	1,035,000
Population	1,000	1,200

(a) Calculate real GDP in Louland in year 2. Show your work.

(b) How would the change in real GDP from year 1 to year 2 affect the demand for money and the nominal interest rate in Louland?

(c) Did the standard of living of the average citizen in Louland increase, decrease, or remain the same from year 1 to year 2 ? Explain using numbers.

(d) What was the numerical value of the inflation rate from year 1 to year 2 ?

(e) If nominal wages increased by 10% from year 1 to year 2, what happened to the real wages of workers in Louland during this time? Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

2. Assume that commercial banks must hold a minimum of 20% of their deposits as reserves. Now suppose that the central bank of the country sells \$100,000 of government bonds to commercial banks.

(a) Calculate the maximum change and state the direction of change in the money supply as a result of the central bank bond sale. Show your work.

(b) Draw a correctly labeled graph of the money market and show the effect of the change in the money supply identified in part (a) on the nominal interest rate.

(c) Given the change in the money supply in part (a), if the velocity of money is constant, what will happen to the nominal gross domestic product? Explain.

(d) Based on the change in the nominal gross domestic product in part (c), what happens to the price level if the real gross domestic product is constant?

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.



1. Assume the United States economy is in short-run macroeconomic equilibrium at an output level greater than potential output.
- (a) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, and show each of the following.
- (i) The current equilibrium real output and price level, labeled as Y_1 and PL_1 , respectively
 - (ii) The full-employment output, labeled as Y_F
- (b) Assume government spending increases by \$100 billion. On your graph in part (a), show the short-run effect of the change in government spending on the equilibrium real output and price level. Label the new equilibrium output as Y_2 and the new equilibrium price level as PL_2 .
- (c) Assume the marginal propensity to consume is 0.8. As a result of the increase in government spending, what is the numerical value of the maximum change in each of the following in the short run?
- (i) Real output
 - (ii) Household savings
- (d) Draw a correctly labeled graph of the money market and show the effect of the change in real output identified in part (c)(i) on the equilibrium nominal interest rate.
- (e) Based on the change in the nominal interest rate shown in part (d), what will happen to the prices of previously issued bonds in the short run?
- (f) The United States and the European Union are trading partners with flexible exchange rates. The currency in the United States is the dollar, and the currency in the European Union is the euro. Assume the inflation rate in the United States increases relative to the inflation rate in the European Union. As a result of the change in the United States inflation rate, what will happen to each of the following in the foreign exchange market?
- (i) The demand for dollars. Explain.
 - (ii) The international value of the dollar
- (g) Suppose the Federal Reserve attempts to keep the value of the dollar constant in the foreign exchange market. Based on the change in the value of the dollar in part (f)(ii), should the Federal Reserve buy or sell each of the following?
- (i) The euro
 - (ii) The dollar

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

1. Assume Smithland is in short-run equilibrium at a level of output that exceeds the full-employment level of output.
- (a) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, and show each of the following.
- (i) The current equilibrium real output and price level, labeled Y_1 and PL_1 , respectively
 - (ii) The full-employment output, labeled Y_F
- (b) Assume Smithland's government cuts individual income taxes. On your graph in part (a), show the short-run effect of the tax cut on equilibrium real output, labeling the new short-run equilibrium real output Y_2 .
- (c) Based solely on the change in real output on your graph in part (b), what will happen to each of the following in the short run?
- (i) The natural rate of unemployment
 - (ii) Nominal interest rates. Explain.
- (d) Assume instead the central bank intervenes to correct an inflationary output gap. What open-market operation should the central bank take?
- (e) Draw a correctly labeled graph of the money market, and show the effect of the open-market operation identified in part (d) on the nominal interest rate.
- (f) Based solely on the interest rate change identified in part (e), what will happen to the international value of Smithland's currency in the foreign exchange market? Explain.
- (g) Based solely on the exchange rate change identified in part (f), will Smithland's imports increase, decrease, or remain the same? Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

MACROECONOMICS**Section II****Total Time—1 hour****Reading Period—10 minutes****Writing Period—50 minutes**

Directions: You are advised to spend the first 10 minutes reading all of the questions and planning your answers. You will then have 50 minutes to answer all three of the following questions. You may begin writing your responses before the reading period is over. It is suggested that you spend approximately half your time on the first question and divide the remaining time equally between the next two questions. Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. Use a pen with black or dark blue ink.

1. Canada is an open economy that is currently in a recessionary output gap.
 - (a) Draw a correctly labeled graph of the long-run aggregate supply, short-run aggregate supply, and aggregate demand curves, and show each of the following.
 - (i) The current equilibrium real output and price level, labeled as Y_1 and PL_1 , respectively
 - (ii) Full-employment output, labeled Y_f
 - (b) The central bank and the government do not take any policy actions to close the output gap.
 - (i) Explain how the economy will adjust to full employment in the long run.
 - (ii) On your graph in part (a), show how the economy adjusts to full employment in the long run.
 - (c) Suppose the Canadian government is unwilling to wait for the long-run adjustment process. The marginal propensity to consume is 0.8. The equilibrium real output is \$500 billion and the full-employment output is \$540 billion.
 - (i) Calculate the minimum change and indicate the direction of change in government spending required to shift the aggregate demand curve by the amount of the output gap.
 - (ii) Calculate the minimum change and indicate the direction of change in taxes required to shift the aggregate demand curve by the amount of the output gap.
 - (d) Assume instead that the Canadian central bank takes actions to restore the economy to full-employment output by influencing investment spending. Draw a correctly labeled graph of the money market, and show the effect of the actions taken by the central bank on the equilibrium interest rate.
 - (e) Canada and Mexico are trading partners. Draw a correctly labeled graph of the foreign exchange market of the Canadian dollar, and show the effect of the change in the interest rate in part (d) on the value of the Canadian dollar with respect to the Mexican peso.

2. Assume that an economy is in long-run equilibrium. Assume that consumers wish to hold less money because they use credit cards more frequently to purchase goods and services than cash.
 - (a) Draw a correctly labeled graph of the money market and show the effect of the reduced holdings of money on the equilibrium nominal interest rate in the short run.
 - (b) Based on the change in the interest rate in part (a), what will happen to each of the following in the short run?
 - (i) Prices of previously issued bonds
 - (ii) The price level and real income. Explain.
 - (c) With a constant money supply, based on your answer to part b(ii), will the velocity of money increase, decrease, or remain the same, or is the change indeterminate?
 - (d) If the central bank wishes to reverse the change in the interest rate identified in part (a), what open market operation would it use?
-

MACROECONOMICS**Section II****Planning Time—10 minutes****Writing Time—50 minutes**

Directions: You have 10 minutes to read all of the questions in this booklet, to sketch graphs, to make notes, and to plan your answers. You will then have 50 minutes to answer all three of the following questions. It is suggested that you spend approximately half your time on the first question and divide the remaining time equally between the next two questions. Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. Use a pen with black or dark blue ink.

1. Assume that the United States economy is operating below full employment.
 - (a) Draw a correctly labeled graph of long-run aggregate supply, short-run aggregate supply, and aggregate demand, and show each of the following.
 - (i) Current equilibrium output and price level, labeled as Y_1 and PL_1
 - (ii) Full-employment output, labeled as Y_f
 - (b) Assume that the Federal Reserve targets a new federal funds rate to reach full employment. Should the Federal Reserve target a higher or lower federal funds rate?
 - (c) Given the Federal Reserve action you identified in part (b), draw a correctly labeled graph of the money market and show the effect on the nominal interest rate.
 - (d) The policy makers pursue a fiscal policy rather than the monetary policy in part (b). Assume that the marginal propensity to consume is 0.8 and the value of the recessionary gap is \$300 billion.
 - (i) If the government changes its spending without changing taxes to eliminate the recessionary gap, calculate the minimum required change in government spending.
 - (ii) If the government changes taxes without changing government spending to eliminate the recessionary gap, will the minimum required change in taxes be greater than, smaller than, or equal to the minimum required change in government spending in part (d)(i)? Explain.
 - (e) Assume the government lowers income tax rates to eliminate the recessionary gap. Will each of the following increase, decrease, or stay the same?
 - (i) Aggregate demand. Explain.
 - (ii) Long-run aggregate supply. Explain.

2. The Federal Reserve can influence the supply of money.
 - (a) Assume that the Federal Reserve targets a lower federal funds rate.
 - (i) What open market operation can the Federal Reserve use to achieve the lower target?
 - (ii) Given your answer to part (a)(i), what will happen to the price of government bonds?
 - (b) Using a correctly labeled graph of the money market, show the effect of the open market operation from part (a)(i) on the nominal interest rate.
 - (c) Assume that the Federal Reserve buys government bonds from commercial banks. Based only on this transaction, will the level of required reserves in the commercial banks increase, decrease, or remain the same?
 - (d) Another monetary policy action involves changing the discount rate. Define the discount rate.

4.6 Monetary Policy

Name: _____ Class: _____ Date: _____

Total: 9 marks

KEY WORDS monetary policy 货币政策 • discount rate 贴现率
 • open-market operations 公开市场操作 • contractionary (tight) 紧缩性
 • expansionary (easy) 扩张性

Objective

Build the skills to answer exam questions on **monetary policy**.**You must be able to:**

- define **monetary policy** 货币政策 as the central bank's control of the money supply and interest rates
- distinguish **expansionary** (easy) from **contractionary** (tight) monetary policy
- describe the tools: **open-market operations** 公开市场操作, the reserve requirement, and the discount rate
- trace how a change in interest rates affects investment, AD, and output

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ Monetary policyThe central bank's control of the **money supply** and **interest rates** to steer the economy.**■ Expansionary vs contractionary**

- **Expansionary** — buy bonds, cut the reserve ratio or discount rate → rates **down** → AD **up** (fights recession).
- **Contractionary** — the reverse (fights inflation).

■ The tools and transmission

Open-market operations, the **reserve requirement**, and the **discount rate**.
 Lower rates → more investment → higher AD → higher output.

2 Practice

2.1 Define monetary policy. [1]

2.2 Name the three tools of monetary policy. [2]

2.3 State the monetary policy used to fight a recession. [1]

3 Exam-style questions

3.1 To conduct expansionary monetary policy, a central bank [1]

- A sells bonds
- B buys bonds
- C raises the reserve ratio
- D raises taxes

3.2 When the central bank buys bonds, interest rates [1]

- A rise
- B fall
- C stay the same
- D become negative

3.3 A central bank wants to reduce high inflation.

(a) Name the type of monetary policy it should use. [1]

(b) State one tool and how it would be used. [2]

Solutions

2.1 the central bank's control of the money supply and interest rates to influence the economy.

2.2 open-market operations, the reserve requirement, the discount rate.

2.3 expansionary (easy) monetary policy.

3.1 B.

3.2 B.

3.3 (a) contractionary (tight) monetary policy. (b) e.g. sell bonds on the open market (or raise the reserve ratio / discount rate) to reduce the money supply.

Name: _____

AP Macroeconomics: 2026

1. The economy of Micanapy is in short-run equilibrium and is experiencing an inflationary gap.

Part A

Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves for Micanapy, and show each of the following.

- The current equilibrium real output and price level, labeled Y_1 and PL_1 , respectively
- The full-employment real output, labeled Y_F

Part B

Assume that policymakers take no action to close the inflationary gap. Explain how Micanapy's economy will self-adjust to full employment in the long run.

Part C

Suppose instead that Micanapy's central bank is considering using monetary policy to close the inflationary gap in the short run. The banking system in Micanapy has limited reserves.

- Identify a specific open-market operation that the central bank of Micanapy would implement to close the inflationary gap in the short run.
- Draw a correctly labeled graph of the money market in Micanapy, and show the effect of the open-market operation identified in part C (i) on the nominal interest rate.

Part D

Based solely on the interest rate change shown on your graph in part C (ii), will each of the following increase, decrease, or remain the same in the short run?

- International financial capital flows into Micanapy. Explain.
- The price of previously issued bonds in Micanapy
- Private domestic investment spending in Micanapy

Part E

Based solely on the change in private domestic investment spending identified in part D (iii), will the unemployment rate in Micanapy increase, decrease, or remain the same in the short run? Explain.

3. Lizland is a small island nation, and its currency is the Lizland crown (LIZ). The economy of Lizland is in short-run macroeconomic equilibrium with a 600 million crown recessionary gap.

Part A

Policymakers in Lizland are considering taking action to close the recessionary gap in the short run.

- The central bank of Lizland is considering implementing monetary policy. The banking system of Lizland has ample reserves. Identify a specific monetary policy action the central bank of Lizland would implement to close the recessionary gap in the short run.
- The government of Lizland is also considering changing its spending, and the marginal propensity to consume is 0.75. Calculate the minimum change in government spending and identify the direction of the change required to fully close the 600 million crown recessionary gap in the short run. Show your work.

Part B

Assume that the government of Lizland decides to change its spending as calculated in part A (ii). Based solely on this change, will the price level in Lizland increase, decrease, or remain the same in the short run? Explain.

Part C

The nations of Lizland and Andoh are trading partners with flexible exchange rates. The currency of Andoh is the Andoh note (AND). Draw a correctly labeled graph of the foreign exchange market for the Lizland crown (LIZ). Based solely on the change in the price level in part B, show the change in the international value of the Lizland crown on your graph.

STOP
END OF EXAM

2. The economies of Country L and Country A are currently in short-run equilibrium at output levels below full employment. Both countries intend to use monetary policy to close their output gaps. Country L has a banking system with limited reserves, and Country A has a banking system with ample reserves.
- What open-market operation would Country L implement to move the economy toward full employment in the short run?
 - What specific monetary policy action would Country A implement to move the economy toward full employment in the short run?
 - Draw a correctly labeled graph of the reserve market in Country A, and show the effect of the monetary policy action identified in part B on the policy rate.
 - Assume instead that no policy actions are taken in Country A and that the economy remains in short-run equilibrium at an output level below full employment. Will short-run aggregate supply in Country A increase, decrease, or remain the same as the economy self-adjusts in the long run? Explain.



2. Assume the economy of Jenland is in short-run equilibrium at a real output level above full-employment real output.

- The banking system in Jenland has ample reserves. Identify a specific monetary policy action that the central bank of Jenland would implement to return the economy to full employment in the short run.
- Draw a correctly labeled graph of the reserve market for Jenland, and show the effect of the central bank's action identified in part A on the policy rate.
- Based on the change in the interest rate shown on your graph in part B, will each of the following increase, decrease, or remain the same in Jenland in the short run?
 - The price of previously issued bonds
 - The price level. Explain.

1. The economy of Alpha is in short-run equilibrium with a cyclical unemployment rate of 3%, a frictional unemployment rate of 4%, and an actual unemployment rate of 8%.

- Calculate Alpha's natural rate of unemployment. Show your work.
- Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves for Alpha, and show each of the following.
 - The current equilibrium output and price level, labeled Y_1 and PL_1 , respectively
 - The full-employment output, labeled Y_F
- Assume that policymakers take no action to close the output gap.
 - Explain how Alpha's economy will adjust to full employment in the long run.
 - On your graph in part (b), show how Alpha's economy will adjust to full employment in the long run, labeling the new equilibrium price level PL_2 .
- Assume instead that Alpha's central bank is considering using monetary policy to close a recessionary output gap. The banking system in Alpha has ample reserves. Identify a specific monetary policy action the central bank of Alpha would take to close the output gap in the short run.
- Draw a correctly labeled graph of the reserve market in Alpha, and show the effect of the action taken by the central bank identified in part (d) on the policy rate.
- Based on the change in the policy rate shown in part (e), what would happen to each of the following in the short run in Alpha?
 - The price of previously issued bonds
 - The price level. Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.



1. Assume that the economy of Moneyland is in equilibrium with an actual unemployment rate equal to the natural rate of unemployment.
- (a) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, and show each of the following.
- The current equilibrium real output and price level, labeled Y_1 and PL_1 , respectively
 - The full employment output, labeled Y_F
- (b) Assume that consumer spending in Moneyland decreases from \$110,000 to \$100,000 as a result of a decrease in disposable income in Moneyland from \$135,000 to \$110,000.
- Calculate the marginal propensity to consume in Moneyland. Show your work.
 - Show the short-run effect of the decrease in consumer spending in Moneyland on your graph in part (a), labeling the new equilibrium real output and price level Y_2 and PL_2 , respectively.
- (c) Following the decrease in consumer spending, explain how the economy would adjust in the long run in the absence of any policy actions.
- (d) The central bank of Moneyland is concerned about the short-run effects of the decrease in consumer spending on the broader economy and is considering taking action rather than waiting for the long-run adjustment process. Assuming the banking system in Moneyland has ample reserves, identify a specific monetary policy action the central bank of Moneyland would take to increase consumer spending.
- (e) Draw a correctly labeled graph of the reserve market in Moneyland, and show the effect of the monetary policy action identified in part (d) on the policy rate.
- (f) How would the change in the policy rate shown on your graph in part (e) affect each of the following in Moneyland in the short run?
- The quantity of national savings
 - Unemployment. Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

2. The economy of Noralandia is in short-run equilibrium with an actual inflation rate that is currently higher than the expected inflation rate.
- (a) Draw a correctly labeled graph of the short-run and long-run Phillips curves. Label the current short-run equilibrium point as X.
- (b) The banking system in Noralandia has ample reserves. Identify a specific monetary policy action that the central bank of Noralandia would take to bring the inflation rate closer to the expected inflation rate.
- (c) Noralandia has an open economy and a flexible exchange rate. Based solely on the effect of the monetary policy action identified in part (b) on interest rates in Noralandia, will there be an increase, a decrease, or no change in the flow of international financial capital into Noralandia? Explain.
- (d) Based on your answer to part (c), what will happen to the international value of Noralandia's currency? Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

3. Assume that the economy of country Zen is in long-run macroeconomic equilibrium.
- (a) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, and show each of the following.
- The current equilibrium real output and price level, labeled Y_1 and PL_1 , respectively
 - The full-employment output, labeled Y_F
- (b) On your graph in part (a), show the short-run effect of an increase in consumer confidence. Label the new equilibrium real output Y_2 and the new equilibrium price level PL_2 .
- (c) Assume that the banking system in Zen has ample reserves. Suppose that the central bank's goal is to maintain a stable price level at PL_1 . Based on the change in the price level shown in part (b), identify one specific monetary policy action the central bank would take to achieve its goal.
- (d) Based on the monetary policy action identified in part (c), will real output increase, decrease, or stay the same in the short run? Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

STOP

END OF EXAM

1. Assume the economy of Sweden is in long-run equilibrium and has a surplus in its current account.
- (a) Is the Swedish capital and financial account in deficit, in surplus, or in balance? Explain.
- (b) Draw a correctly labeled graph of short-run aggregate supply, long-run aggregate supply, and aggregate demand curves for Sweden, and show the current equilibrium real output, labeled Y_1 , and the current equilibrium price level, labeled PL_1 .
- (c) Assume the United Kingdom decreases its imports from Sweden. On your graph in part (b), show the new equilibrium real output, labeled Y_2 , and the new equilibrium price level, labeled PL_2 , as a result of this change.
- (d) As a result of the decrease in the United Kingdom's imports from Sweden, would policy makers in Sweden be more concerned about cyclical unemployment or inflationary pressures in the short run? Explain.
- (e) If the Swedish central bank's goal is to return the economy to long-run equilibrium, what open-market operation should it use?
- (f) The currency of the United Kingdom is the pound, and the currency of Sweden is the krona. Draw a correctly labeled graph of the foreign exchange market for the krona, and show the impact of the decrease in the United Kingdom's imports from Sweden on the value of the krona in the foreign exchange market.
- (g) If the Swedish central bank's goal is to reverse the exchange rate change shown in part (f) by changing the interest rate, what open-market operation should it use?
- (h) Explain how the open-market operation identified in part (g) would reverse the change in the exchange rate.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

1. Assume Smithland is in short-run equilibrium at a level of output that exceeds the full-employment level of output.
- (a) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, and show each of the following.
- (i) The current equilibrium real output and price level, labeled Y_1 and PL_1 , respectively
- (ii) The full-employment output, labeled Y_F
- (b) Assume Smithland's government cuts individual income taxes. On your graph in part (a), show the short-run effect of the tax cut on equilibrium real output, labeling the new short-run equilibrium real output Y_2 .
- (c) Based solely on the change in real output on your graph in part (b), what will happen to each of the following in the short run?
- (i) The natural rate of unemployment
- (ii) Nominal interest rates. Explain.
- (d) Assume instead the central bank intervenes to correct an inflationary output gap. What open-market operation should the central bank take?
- (e) Draw a correctly labeled graph of the money market, and show the effect of the open-market operation identified in part (d) on the nominal interest rate.
- (f) Based solely on the interest rate change identified in part (e), what will happen to the international value of Smithland's currency in the foreign exchange market? Explain.
- (g) Based solely on the exchange rate change identified in part (f), will Smithland's imports increase, decrease, or remain the same? Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

MACROECONOMICS**Section II****Total Time—1 hour****Reading Period—10 minutes****Writing Period—50 minutes**

Directions: You are advised to spend the first 10 minutes reading all of the questions and planning your answers. You will then have 50 minutes to answer all three of the following questions. You may begin writing your responses before the reading period is over. It is suggested that you spend approximately half your time on the first question and divide the remaining time equally between the next two questions. Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. Use a pen with black or dark blue ink.

1. Assume the United States economy is in recession.

- (a) Draw a correctly labeled graph of the long-run aggregate supply, short-run aggregate supply, and aggregate demand curves, and show each of the following.

(i) Current price level, labeled PL_1

(ii) Current output, labeled Y_1

- (b) Now assume the euro zone, a major trading partner of the United States, enters into a recession.

(i) What will be the effect on United States exports to the euro zone? Explain.

(ii) On your graph in part (a), show the effect of the change identified in part (b)(i) on real output in the United States.

(iii) What will be the effect of the change identified in part (b)(ii) on unemployment in the United States?

- (c) Assume the euro zone recession causes a decrease in the demand for United States dollars in the foreign exchange market.

(i) Will the euro appreciate, depreciate, or remain unchanged against the dollar? Explain.

(ii) Draw a correctly labeled graph of the foreign exchange market for dollars, and show the effect of the decrease in the demand for dollars on the exchange rate for dollars.

- (d) Assume the United States implements a combination of expansionary fiscal and monetary policies. In the absence of complete crowding out, what will be the effect of these policies on each of the following?

(i) Aggregate demand in the United States

(ii) The price level in the United States

(iii) Interest rates in the United States. Explain.

MACROECONOMICS**Section II****Planning Time—10 minutes****Writing Time—50 minutes**

Directions: You have 10 minutes to read all of the questions in this booklet, to sketch graphs, to make notes, and to plan your answers. You will then have 50 minutes to answer all three of the following questions. It is suggested that you spend approximately half your time on the first question and divide the remaining time equally between the next two questions. Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. Use a pen with black or dark blue ink.

1. Assume that the United States economy is operating below full employment.

- (a) Draw a correctly labeled graph of long-run aggregate supply, short-run aggregate supply, and aggregate demand, and show each of the following.

(i) Current equilibrium output and price level, labeled as Y_1 and PL_1

(ii) Full-employment output, labeled as Y_f

- (b) Assume that the Federal Reserve targets a new federal funds rate to reach full employment. Should the Federal Reserve target a higher or lower federal funds rate?

- (c) Given the Federal Reserve action you identified in part (b), draw a correctly labeled graph of the money market and show the effect on the nominal interest rate.

- (d) The policy makers pursue a fiscal policy rather than the monetary policy in part (b). Assume that the marginal propensity to consume is 0.8 and the value of the recessionary gap is \$300 billion.

(i) If the government changes its spending without changing taxes to eliminate the recessionary gap, calculate the minimum required change in government spending.

(ii) If the government changes taxes without changing government spending to eliminate the recessionary gap, will the minimum required change in taxes be greater than, smaller than, or equal to the minimum required change in government spending in part (d)(i)? Explain.

- (e) Assume the government lowers income tax rates to eliminate the recessionary gap. Will each of the following increase, decrease, or stay the same?

(i) Aggregate demand. Explain.

(ii) Long-run aggregate supply. Explain.

4.7 The Loanable Funds Market

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

KEY WORDS loanable funds market 可贷资金市场 • equilibrium real interest rate 实际利率
• nominal interest rate 名义利率

Objective

Build the skills to answer exam questions on **the loanable funds market**.

You must be able to:

- describe the **loanable funds market** 可贷资金市场, where saving is supplied and borrowing demanded
- determine the **equilibrium real interest rate** 实际利率
- analyse how government borrowing, saving, or investment demand shift the market

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ **The loanable funds market**

Savers supply loanable funds; **borrowers** (firms investing and the government) demand them.

■ **Equilibrium**

The **real interest rate** where the quantity of funds saved equals the quantity borrowed.

■ **Shifts**

- More **government borrowing** → demand shifts right → real rate **up** (crowding out).
- More **saving** → supply shifts right → real rate **down**.

2 Practice

2.1 State who supplies and who demands loanable funds. [2]

2.2 State what is determined in the loanable funds market. [1]

2.3 State the effect of increased government borrowing on the real interest rate. [1]

3 Exam-style questions

3.1 In the loanable funds market, the “price” is the [1]

- **A** nominal interest rate
- **B** real interest rate
- **C** exchange rate
- **D** price level

3.2 An increase in saving shifts the supply of loanable funds [1]

- **A** to the left
- **B** to the right
- **C** not at all
- **D** vertically

3.3 The government runs a large budget deficit and borrows heavily.

(a) State the effect on the demand for loanable funds. [1]

(b) State the effect on the real interest rate. [1]

(c) Name the effect this has on private investment. [1]

Solutions

2.1 savers supply funds; borrowers (firms and government) demand them.

2.2 the equilibrium real interest rate.

2.3 it rises.

3.1 B.

3.2 B.

3.3 (a) it increases (shifts right). (b) it rises. (c) crowding out of private investment.

Name: _____

AP Macroeconomics: **2025 Set 2**

- 1.** Assume that the economy of Barrikos is in short-run equilibrium, with its economic data summarized in the table provided. The government budget is balanced, and the capital and financial account (CFA) balance is zero.

Cyclical unemployment rate	6%
Natural unemployment rate	4%
Structural unemployment rate	1%
Actual inflation rate	3%
Expected inflation rate	5%

- A.** What is the numerical value of the actual unemployment rate in Barrikos?
- B.** Using the relevant numerical values, draw a correctly labeled graph of the short-run and long-run Phillips curves for Barrikos. Indicate the current short-run equilibrium with a point labeled X. Plot the relevant numerical values on the graph.
- C.** Based on your graph in part B, identify one specific fiscal policy action that the government of Barrikos would take to move the economy toward long-run equilibrium.
- D.** Assume that the fiscal policy action identified in part C is implemented.
- Will the government budget in Barrikos move into surplus, move into deficit, or remain balanced? Explain.
 - Assume there is no change in inflationary expectations. On your graph in part B, show a possible new short-run equilibrium point, labeled Z, that would result from the fiscal policy action identified in part C.
 - Draw a correctly labeled graph of the loanable funds market, and show the effect of the fiscal policy action identified in part C on the real interest rate.
- E.** Barrikos has an open economy and a flexible exchange rate. Based solely on the change in the real interest rate in Barrikos shown on your graph in part D (iii), will Barrikos' capital and financial account (CFA) balance move into surplus, move into deficit, or remain the same? Explain.
- F.** Based on the change in Barrikos' capital and financial account (CFA) balance identified in part E, what will happen to the international value of Barrikos' currency? Explain.

1. Assume that the economy of Moneyland is in equilibrium with an actual unemployment rate equal to the natural rate of unemployment.
- (a) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, and show each of the following.
- The current equilibrium real output and price level, labeled Y_1 and PL_1 , respectively
 - The full employment output, labeled Y_F
- (b) Assume that consumer spending in Moneyland decreases from \$110,000 to \$100,000 as a result of a decrease in disposable income in Moneyland from \$135,000 to \$110,000.
- Calculate the marginal propensity to consume in Moneyland. Show your work.
 - Show the short-run effect of the decrease in consumer spending in Moneyland on your graph in part (a), labeling the new equilibrium real output and price level Y_2 and PL_2 , respectively.
- (c) Following the decrease in consumer spending, explain how the economy would adjust in the long run in the absence of any policy actions.
- (d) The central bank of Moneyland is concerned about the short-run effects of the decrease in consumer spending on the broader economy and is considering taking action rather than waiting for the long-run adjustment process. Assuming the banking system in Moneyland has ample reserves, identify a specific monetary policy action the central bank of Moneyland would take to increase consumer spending.
- (e) Draw a correctly labeled graph of the reserve market in Moneyland, and show the effect of the monetary policy action identified in part (d) on the policy rate.
- (f) How would the change in the policy rate shown on your graph in part (e) affect each of the following in Moneyland in the short run?
- The quantity of national savings
 - Unemployment. Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

1. Assume the economy of Vanderlandia is in short-run equilibrium with a real GDP of \$500 million. The full-employment level of real GDP is \$550 million.
- (a) Draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves, and show each of the following.
- The current equilibrium real output and price level, labeled Y_1 and PL_1 , respectively
 - The full-employment output, labeled Y_F
- (b) Assume no policy action is taken to restore full employment.
- Explain how the economy will adjust in the long run.
 - Following the long-run adjustment process, will the price level in Vanderlandia be greater than, less than, or equal to PL_1 shown on your graph in part (a)?
- (c) Assume instead that policymakers in Vanderlandia are considering changing government spending to restore full employment in the short run and that the marginal propensity to save is 0.2.
- Calculate the minimum change and state the direction of change in government spending required to completely close the output gap in the short run. Show your work.
 - On your graph in part (a), show the short-run effect of the change in government spending in part (c)(i), labeling the new equilibrium price level PL_2 .
- (d) Draw a correctly labeled graph of the loanable funds market, and show the effect of the change in government spending in part (c)(i) on the equilibrium real interest rate.
- (e) Based on the change in the real interest rate shown on your graph in part (d), what will happen to each of the following?
- The price of previously issued bonds
 - The rate of economic growth in the long run. Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

1. Assume a country's economy is operating below full employment.
- (a) Draw a correctly labeled graph of aggregate demand, short-run aggregate supply, and long-run aggregate supply, and show each of the following.
- (i) The current equilibrium real output and price level, labeled as Y_1 and PL_1 , respectively
 - (ii) The full-employment output, labeled as Y_F
- (b) Identify one fiscal policy action the country's government can take to restore full employment.
- (c) Assume instead that no fiscal policy action is taken. Suppose a change in investment spending causes real GDP to increase by \$200 billion. Calculate the minimum change in investment spending that could have caused this increase in real GDP if the marginal propensity to save is 0.25. Show your work.
- (d) Assume the output gap was initially \$800 billion. On your graph in part (a), show the short-run effect of the change in investment spending identified in part (c), labeling the new equilibrium real output as Y_2 and the new equilibrium price level as PL_2 .
- (e) Given your answer to part (d), is the actual rate of unemployment greater than, less than, or equal to the natural rate of unemployment? Explain.
- (f) Assume that private savings now increase. Draw a correctly labeled graph of the loanable funds market and show the effect of the increase in private savings on the real interest rate.
- (g) Based solely on the change in the real interest rate shown in part (f), what will happen to each of the following?
- (i) Real GDP in the short run. Explain.
 - (ii) Long-run aggregate supply. Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

3. The economy of Country Zeta is in long-run equilibrium; however, the government is concerned about the size of the national debt.
- (a) Identify one specific fiscal policy action the government could take to reduce the national debt.
- (b) Draw a correctly labeled graph of the loanable funds market, and show the effect of the fiscal policy action identified in part (a) on the real interest rate.
- (c) Based on the change in the real interest rate identified in part (b), what will happen to each of the following?
- (i) Aggregate demand in the short run. Explain.
 - (ii) Potential real output. Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.



STOP

END OF EXAM

2. Assume a country's economy is currently operating below full employment.
- (a) Identify a fiscal policy action the country's government could implement to restore full employment.
- (b) Draw a correctly labeled graph of the loanable funds market, and show the effect of the fiscal policy action identified in part (a) on the equilibrium real interest rate.
- (c) Based solely on the real interest rate change shown in part (b), what will happen to each of the following?
- (i) Net exports. Explain.
 - (ii) The stock of physical capital. Explain.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.



2. Assume the expected inflation rate in a country is 3%, the current unemployment rate is 6%, and the natural rate of unemployment is 4%.
- Draw a correctly labeled graph of the short-run and long-run Phillips curves. Label the current short-run equilibrium as point X and plot the numerical values above on the graph.
 - Is the actual inflation rate greater than, less than, or equal to the expected inflation rate of 3%?
 - Assume loans were made taking into account the expected inflation rate of 3%. Will lenders be better off or worse off after they realize the actual inflation rate identified in part (b)? Explain.
 - Based on the relationship between the actual and the expected inflation rates identified in part (a), what will happen to the natural rate of unemployment in the long run?
-
3. Assume that households in Econland increase their savings for retirement.
- Using a correctly labeled graph of the loanable funds market, show how the increase in savings will affect the equilibrium real interest rate.
 - Based solely on the real interest rate change identified in part (a), what will happen to Econland's purchases of foreign assets? Explain.
 - Consider the foreign exchange market for Econland's currency.
 - Based on your answer to part (b), what will happen to the international value of Econland's currency?
 - Based on your answer to part c (i), would Econland's central bank buy or sell its currency in the foreign exchange market to offset the change in the value of its currency?

STOP**END OF EXAM****MACROECONOMICS****Section II****Total Time—1 hour****Reading Period—10 minutes****Writing Period—50 minutes**

Directions: You are advised to spend the first 10 minutes reading all of the questions and planning your answers. You will then have 50 minutes to answer all three of the following questions. You may begin writing your responses before the reading period is over. It is suggested that you spend approximately half your time on the first question and divide the remaining time equally between the next two questions. Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. Use a pen with black or dark blue ink.

1. Assume the economy of Artland is currently operating above full employment.
- Draw a correctly labeled graph of the short-run aggregate supply, long-run aggregate supply, and aggregate demand curves, and show each of the following.
 - The current equilibrium real output and price level, labeled as Y_1 and PL_1 , respectively
 - The full-employment output, labeled as Y_f
 - Assume the central bank and the government do not take any policy actions to close the output gap.
 - On your graph in part (a), show how the economy automatically adjusts in the long run and label the new equilibrium price level PL_2 .
 - Explain the cause of the adjustment shown in part (b)(i).
 - Alternatively, suppose the government wants to close the output gap using fiscal policy.
 - Identify a fiscal policy action the government could implement to close the output gap.
 - How will the fiscal policy action identified in part (c)(i) affect the following?
 - The unemployment rate
 - The natural rate of unemployment
 - In closing the output gap, will the automatic adjustment identified in part (b)(i) produce a higher, a lower, or the same price level compared to the fiscal policy identified in part (c)(i)?
 - Draw a correctly labeled graph of the market for loanable funds. Show the effect of the fiscal policy action identified in part (c)(i) on the equilibrium real interest rate.
 - Given the interest rate change identified in part (d), will the long-run aggregate supply curve shift to the right, shift to the left, or remain the same in the long run? Explain.

2. Assume the economy of Ucheland is currently at full employment. The government of Ucheland reduces the tax rate on household interest earnings.
- (a) What will happen to private savings in Ucheland?
 - (b) Draw a correctly labeled graph of the loanable funds market, and show the effect of the change in private savings identified in part (a) on the equilibrium real interest rate.
 - (c) Given the real interest rate change identified in part (b), answer the following questions.
 - (i) What is the short-run effect on aggregate demand? Explain.
 - (ii) What is the long-run effect on potential real gross domestic product in Ucheland? Explain.

AP Macroeconomics: 2017

2. Assume that an economy is in long-run equilibrium. Assume that consumers wish to hold less money because they use credit cards more frequently to purchase goods and services than cash.
- (a) Draw a correctly labeled graph of the money market and show the effect of the reduced holdings of money on the equilibrium nominal interest rate in the short run.
 - (b) Based on the change in the interest rate in part (a), what will happen to each of the following in the short run?
 - (i) Prices of previously issued bonds
 - (ii) The price level and real income. Explain.
 - (c) With a constant money supply, based on your answer to part b(ii), will the velocity of money increase, decrease, or remain the same, or is the change indeterminate?
 - (d) If the central bank wishes to reverse the change in the interest rate identified in part (a), what open market operation would it use?
-
3. A country is at full employment and produces two types of goods: consumer goods and capital goods.
- (a) Draw a correctly labeled graph of the production possibilities curve, with consumer goods on the horizontal axis and capital goods on the vertical axis. Indicate a point on your graph, labeled X, that represents full employment and a possible combination in which both goods are being produced.
 - (b) Assume there is an increase in the country's national savings. Draw a correctly labeled graph of the loanable funds market, showing the change in the real interest rate from the increase in savings.
 - (c) On the same graph from part (a), show another point, labeled Z, that represents full employment and a new combination of consumer goods and capital goods consistent with the increase in the country's national savings.
 - (d) Referring to your answer to part (c), will the long-run aggregate supply curve shift to the right, shift to the left, or remain the same? Explain.

STOP**END OF EXAM**

2. Country X and Country Y are trading partners, and both produce furnaces and solar panels. The countries can produce the following amounts using equal amounts of resources.
- Country X: 6 furnaces or 8 solar panels
- Country Y: 6 furnaces or 12 solar panels
- (a) Which country has an absolute advantage in producing solar panels?
 - (b) Calculate the opportunity cost of a furnace in Country Y.
 - (c) Which country has the comparative advantage in producing furnaces? Explain.
 - (d) If the terms of trade were that 2 furnaces are exchanged for 1 solar panel, should Country X produce solar panels domestically or import solar panels from Country Y?

3. Exchange rates and interest rates are important for macroeconomic decision making.
- (a) How does an increase in Japan's government budget deficit affect each of the following?
 - (i) The real interest rate in the short run in Japan. Explain.
 - (ii) Private domestic investment in plant and equipment in Japan
 - (b) Draw a correctly labeled graph of the foreign exchange market for the euro, and show the effect of the change in the real interest rate in Japan from part (a)(i) on each of the following.
 - (i) Supply of euros. Explain.
 - (ii) Yen price of the euro
 - (c) To reverse the change in the yen price of the euro identified in part (b)(ii), should the European Central Bank buy or sell euros in the foreign exchange market?

STOP**END OF EXAM**

MACROECONOMICS**Section II****Planning Time—10 minutes****Writing Time—50 minutes**

Directions: You have 10 minutes to read all of the questions in this booklet, to sketch graphs, to make notes, and to plan your answers. You will then have 50 minutes to answer all three of the following questions. It is suggested that you spend approximately half your time on the first question and divide the remaining time equally between the next two questions. In answering the questions, you should emphasize the line of reasoning that generated your results; it is not enough to list the results of your analysis. Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. Use a pen with black or dark blue ink.

1. Assume that the United States economy is currently operating below the full-employment level of real gross domestic product with a balanced budget.
 - (a) Draw a correctly labeled graph of aggregate demand, short-run aggregate supply, and long-run aggregate supply, and show each of the following in the United States.
 - (i) Current output and price level, labeled as Y_1 and PL_1 , respectively
 - (ii) Full-employment output, labeled as Y_f
 - (b) The United States government increases spending on goods and services by \$100 billion, which is financed by borrowing. How will the increase in government spending affect each of the following?
 - (i) Cyclical unemployment
 - (ii) The natural rate of unemployment
 - (c) If the marginal propensity to consume is equal to 0.75, calculate the maximum possible change in real gross domestic product that could result from the \$100 billion increase in government spending.
 - (d) Using a correctly labeled graph of the loanable funds market, show the effect of the \$100 billion increase in government spending on the real interest rate.
 - (e) Based on the real interest rate change in part (d), what is the effect on the long-run economic growth rate? Explain.
 - (f) Now assume that instead of financing the \$100 billion increase in government spending by borrowing, the United States government increases taxes by \$100 billion. With this equal increase in government spending and taxes, will the real gross domestic product increase, decrease, or remain the same? Explain.