



# SOLUTIONS

## ECO 209Y MACROECONOMIC THEORY

### Term Test #1

LAST NAME \_\_\_\_\_

FIRST NAME \_\_\_\_\_

STUDENT NUMBER \_\_\_\_\_

#### INSTRUCTIONS:

1. The total time for this test is 1 hour and 45 minutes.
2. Aids allowed: a simple calculator.
3. Use pen instead of pencil.

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DO NOT WRITE IN THIS SPACE

Part I \_\_\_\_\_/40

Part II \_\_\_\_\_/10

Part III 1. \_\_\_\_\_/10

2. \_\_\_\_\_/10

3. \_\_\_\_\_/10

TOTAL \_\_\_\_\_/80

## PART I (40 marks)

### Instructions:

- Enter your answer to each question in the table below.
- Each correct answer is worth 2.5 marks. **Note that a deduction of 0.5 mark will be made for each incorrect answer.** Table cells left blank will receive a zero mark (i.e., no deduction).
- Do NOT guess your answers!

1	2	3	4	5	6	7	8
C	C	E	C	C	A	B	D
9	10	11	12	13	14	15	16
D	D	D	D	D	E	B	E

1. If investment exceeds private saving by \$40 billion and government spending exceeds tax revenues by \$30 billion, then
  - A) the trade deficit is \$10 billion.
  - B) the trade surplus is \$10 billion.
  - C) the trade deficit is \$70 billion.
  - D) the trade surplus is \$70 billion.
  - E) we cannot say anything about the international trade balance.
2. The photocopy shop at the corner of College and Beverly had revenues of \$300 thousand and a profit of \$30 thousand in 2009. That year, the total expenditures of this shop were \$80 thousand in wages and salaries, \$25 thousand in rent, \$100 thousand in paper and ink, and \$50 thousand in taxes. In addition, the depreciation of the capital stock of the shop was \$15 thousand. The contribution of this photocopy shop to the country's GDP in 2009 was
  - A) \$300 thousand.
  - B) \$275 thousand.
  - C) \$200 thousand.
  - D) \$150 thousand.
  - E) \$125 thousand.

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Use this space for rough work.

Consider a closed economy producing only two goods: computers and pizzas. The following table shows the prices and quantities produced and consumed of each good in 2015 and 2016. Use this information to answer questions 3 to 6 below.

	2015		2016	
	Price	Quantity	Price	Quantity
Computers	800	500	700	550
Pizzas	10	8000	12	8500

3. Consider 2015 the base period. Measured by the GDP deflator, the rate of inflation in 2016 was:
  - A) -5.2 percent.
  - B) 7.8 percent.
  - C) 6.2 percent.
  - D) -2.1 percent.
  - E) -7.2 percent.
4. Considering 2015 the base period, the real rate of growth in 2016 was:
  - A) 6.2 percent.
  - B) 8.6 percent.
  - C) 9.4 percent.
  - D) -3.4 percent.
  - E) 7.5 percent.
5. Using the chain method, the real rate of growth in 2016 was:
  - A) 6.4 percent.
  - B) 9.5 percent.
  - C) 9.3 percent.
  - D) -3.2 percent.
  - E) 7.6 percent.
6. Consider the quantities produced in 2015 to be the constant basket of goods purchased by a representative consumer. Measured by the CPI, the rate of inflation in 2016 was:
  - A) -7.1 percent.
  - B) 7.6 percent.
  - C) 6.2 percent.
  - D) -5.5 percent.
  - E) 3.5 percent.

*Use this space for rough work.*

Use the following data of a hypothetical economy to answer questions 7 and 8.

Consumption	600
Government expenditure on goods and services	250
Net exports	50
Capital consumption allowance (depreciation)	130
Corporate profits before taxes	150
Indirect taxes	140
Government transfer payments	100
Dividends	80
Corporate income taxes	50
Gross investment	200
Personal income taxes	150

7. Given the information in the table above, what is the level of net domestic income?
- A) 950.
  - B) 830.
  - C) 1100.
  - D) 860.
  - E) None of the above is correct.
8. Given the information in the table above, what is the size of the government budget surplus?
- A) -30.
  - B) 50.
  - C) 10.
  - D) -10.
  - E) None of the above is correct.
9. Consider a closed economy without depreciation of the capital stock, without government transfer payments, and where personal income tax is the only source of government revenues. If GDP is \$980 billion, consumption is \$650 billion, private saving is \$120 billion, and government purchases are \$180 billion, which of the following is true in this economy?
- A) Disposable income is \$860.
  - B) Investment is \$120.
  - C) The budget surplus is -\$30.
  - D) Personal income tax is 210.
  - E) None of the above is correct.

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*Use this space for rough work.*

10. Consider an economy with a fixed price level. All else equal, a decrease in the marginal propensity to save
- A) makes the AE curve flatter.
  - B) causes equilibrium income to fall.
  - C) decreases planned investment.
  - D) reduces the government budget deficit.
  - E) causes the money supply to rise.
11. If the  $MPC_{YD}$  is 0.8, there is a \$0.25 tax levied on each dollar of income, and the marginal propensity to import is 0.2, then a \$60 increase in government purchases will cause the budget surplus to
- A) decrease by \$25.
  - B) increase by \$30.
  - C) decrease by \$40.
  - D) decrease by \$35.
  - E) None of the above is correct.
12. Until the end of 2016 you were paying a rent of \$2500 a month for a nice condo in Liberty Village. You purchased this condo from your landlord on January 1, 2017. You paid \$550,000 for the condo and spent an additional \$50,000 in renovations. As a result, in 2017 Canada's GDP will
- A) decrease by \$30,000.
  - B) increase by \$600,000.
  - C) increase by \$570,000.
  - D) increase by \$50,000.
  - E) increase by 20,000.
13. The Consumer Price Index in Canada had values of 100.0 in 1981 and 110.8 in 1982. The nominal rate of interest (i.e., the yield of a one-year government bond) was 18% on average in 1982. What was the average real rate of interest in 1982?
- A) 18%.
  - B) 25.2%.
  - C) 10.8%.
  - D) 7.2%.
  - E) Not enough information to determine.
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*Use this space for rough work.*

14. The IS-curve will become flatter if
- A) money demand increases.
  - B) the interest-sensitivity of investment decreases.
  - C) the marginal propensity to consume decreases.
  - D) the marginal propensity to save increases.
  - E) the income tax rate is reduced.
15. The minimum hourly wage in Ontario is scheduled to reach \$14 in January 2018, an increase of 23 per cent over current levels. By January 2019, the minimum wage will be \$15, an increase of 29 per cent over current levels. Which of the following statements best describes the likely impact of this minimum wage increase?
- A) Unemployment will increase, AE and income will fall, and inflation will rise.
  - B) Unemployment will not change much but AE, income, and inflation will all rise.
  - C) Unemployment will fall but AE, income, and inflation will all rise.
  - D) Unemployment will increase, while AE and income will fall, and inflation will not change much.
  - E) Unemployment and income will not change much, but AE and inflation will increase.
16. "After struggling for years to adjust to sharply lower prices of crude oil, Canada's economy appears finally to be on a sustainable path to recovery," reported the Globe and Mail early this month. Which of the following statements best helps to explain this observation?
- A) The Toronto housing market appears to be cooling off, thus reducing the likelihood of the housing bubble to burst.
  - B) Encouraged by greater consumer demand, the business sector is increasing its expenditure on fixed capital investment.
  - C) Imports have been falling for the last few months, thus increasing net exports.
  - D) Non-oil exports have been rising while imports have been falling, thus increasing net exports.
  - E) Total exports have been growing faster than imports, thus increasing net exports.

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*Use this space for rough work.*

## PART II (10 marks)

Consider the following model of a closed economy:

$$C = 325 + 0.75 YD - 30i$$

$$I = 200 - 20i$$

$$G = 600$$

$$TR = 20$$

$$TA = 120 + 0.2 Y$$

$$Y_{fe} = 2500$$

- a) What is the equation for the  $IS$  curve in this model? Show all your work. (2 marks)

Let's find the equation for the  $AE$  curve first:

$$AE = C + I + G + NX$$

$$= (325 + 0.75 YD - 30i) + (200 - 20i) + 600$$

$$\text{where } YD = Y + TR - TA = Y + 20 - (120 + 0.2 Y) = -100 + 0.8 Y$$

$$= [325 + 0.75 (-100 + 0.8 Y) - 30i] + (200 - 20i) + 600$$

$$= (250 + 0.6 Y - 30i) + (200 - 20i) + 600$$

$$= 1050 + 0.6 Y - 50i$$

Let's find now the equation for the  $IS$  curve:

$$Y = AE$$

$$= 1050 + 0.6 Y - 50i$$

$$50i = 1050 - 0.4 Y$$

$$i = 21 - 0.008 Y$$

- b) What is the level of equilibrium ( $Y^*$ ) income when  $i = 5$ ? (1 mark) What is the size of the aggregate expenditure multiplier ( $\alpha_{AE}$ )? (2 marks) Show all your work.

If  $i^* = 5$ , then  $Y^*$  is:

$$5 = 21 - 0.008 Y^*$$

$$0.008 Y^* = 16$$

$$Y^* = 16 / 0.008 = 2000$$

And the aggregate expenditure multiplier is:

$$\alpha_{AE} = 1 / (1 - \text{slope of } AE \text{ curve}) = 1 / (1 - 0.6) = 1 / 0.4 = 2.5$$

- c) What is the level of private saving ( $S$ ) when the economy is in equilibrium at  $i = 5$ ? (1 mark)  
 What is the level of government saving (or budget surplus,  $BS$ ) at this equilibrium? (1 mark)  
 Show all your work.

$$S = YD - C$$

Where  $YD = -100 + 0.8 Y$  and  $Y^* = 2000$ , therefore,

$$YD = -100 + 0.8 (2000) = -100 + 1600 = 1500.$$

$$\text{And } C = 325 + 0.75 YD - 20 i = 325 + 0.75 (1500) - 30 (5) = 325 + 1125 - 150 = 1300.$$

$$\text{Therefore, } S = YD - C = 1500 - 1300 = 200.$$

$$BS = TA - (G + TR)$$

$$= 120 + 0.2 Y - (600 + 20)$$

$$= 0.2 Y - 500$$

$$= 0.2 (2000) - 500$$

$$= 400 - 500$$

$$= -100.$$

- d) Given the situation of the economy and the budgetary situation of the government you have described above, what should the government do to improve this situation? Explain your answer. (3 marks)

Since equilibrium income is 2000 and full-employment income is 2500, then the economy is in recession and the recessionary gap is 500. Further, at the current equilibrium  $Y$  the government is having a fiscal deficit of 100.

However, if the economy were operating at full capacity (i.e., if  $Y^* = 2500$ , the budget surplus would be:

$$BS = 0.2 Y - 500 = 0.2 (2500) - 500 = 500 - 500 = 0.$$

Since  $BS = 0$  at full employment, then the government is currently experiencing a *cyclical* deficit and not a *structural* one. Therefore, it might be advisable for the government to increase its expenditure on goods and services to kick start the economy, even at the cost of increasing the budget deficit further in the short run.

The new government expenditure might help stopping the contraction of the economy and even contribute to some expansion, but more importantly it will help to improve the expectations of the private sector regarding the economy. And once the private sector becomes more optimistic and starts spending again, the government could start decreasing its spending to achieve a balanced budget over the business cycle.



### PART III (30 marks)

**Instructions:** Answer the following three questions in the space provided. You may continue your answers on page 12 if additional space is required (**but clearly indicate that your answer continues on page 12**). Each question is worth 10 marks.

1. Critically comment on the following statement: *“A country runs a current-account deficit when investment exceeds national savings, and runs a surplus when investment is less than national savings. Therefore, a current-account deficit is a sign of high investment rates and a fast-growing economy.”*

National savings ( $S^N$ ) is equal to private savings ( $S$ ) plus government savings ( $BS$ ). In turn,  $S^N$  is equal to investment ( $I$ ) plus net exports ( $NX$ ). This is an accounting identity, and thus if  $S^N > I$ , then  $NX > 0$ ; and if  $S^N < I$ , then  $NX < 0$ . But accounting identities do not express a causal relationship. For instance, for a given level of  $S$ , is  $I > S^N$  because business fixed capital investment has increased or because the  $BS$  may have turned negative? In the first case, the rate of investment might be high and the economy might be growing fast; in the second case, the government deficit may be crowding out investment and the economy may be stagnating.

Further, assuming a flexible exchange rate system, a current account deficit implies a capital account surplus — another accounting identity. But, again, accounting identities do not express a causal relationship — does the current account deficit cause the capital account surplus; or does the surplus in the capital account cause the current account deficit?

For instance, if the current account deficit is due to the import of fixed capital equipment, then the productive capacity of the economy may be expanding. In this case, the current account deficit could be seen as a sign of a fast growing economy.

But if there is a government deficit (i.e.,  $BS < 0$ ) and this deficit is financed with foreign savings, then the inflow of capital will cause the appreciation of the domestic currency and become responsible for the current account deficit. In this case, therefore, the current account deficit could be seen as a sign of a sluggish economy.

2. Critically comment on the following statement: *“The government runs a balanced budget at the initial equilibrium income. Now it increases the income taxes on the rich and reduces the income taxes on the middle class while still maintaining total taxes unchanged at the initial equilibrium income. Therefore, equilibrium income and the government budget will both remain unchanged.”*

Although this tax change leaves the government budget surplus (BS) unchanged at the initial level of income ( $Y_1$ ), it affects nonetheless overall desired consumption expenditure (C) and thus the level of equilibrium income. Further, as equilibrium income changes, so does government revenues (TA) and the government budget surplus.

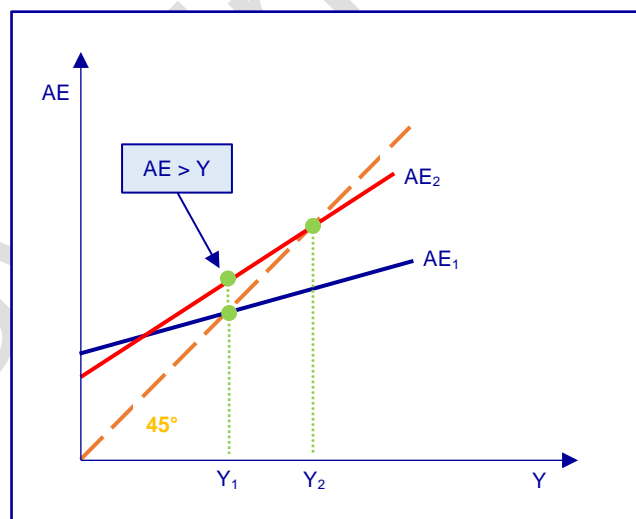
This change in taxes affects the distribution of disposable income (YD) and thus also the economy's  $MPC_{YD}$ , where the latter is the (weighted) average of households  $MPC_{YDs}$  (the weights being determined by the total YD at each bracket of YD). Since the lower the level of income the greater the  $MPC_{YD}$ , this redistribution of income towards the lower income groups increases the weight of low-income households'  $MPC_{YD}$  in the calculation of the economy's (average)  $MPC_{YD}$ , and thus the latter rises. As a result, overall C increases. Indeed, the desired consumption expenditure of the rich remains more or less unchanged when their tax rates go up while the consumption expenditure of the middle class increases significantly when their tax rates fall — and thus C rises.

The increase in C creates a situation of excess demand in the goods market and Y increases. Indeed, firms start selling more than they are actually producing and their inventories fall. This, in turn, gives the signal to the firms that production must be adjusted upward. Therefore, equilibrium Y increases.

Further, the increase in Y causes TA to rise and the government thus moves from a situation of a balanced budget (BS = 0) to one of a positive budget surplus (BS > 0).

The above is depicted graphically in the AE diagram on the right (assuming constant interest rate). The increase in the economy's  $MPC_{YD}$  causes the AE curve to become steeper, shifting from  $AE_1$  to  $AE_2$ . At  $Y_1$  there is now an excess demand, i.e.,  $AE > Y$ , and thus Y increases from  $Y_1$  to  $Y_2$ .

The statement is therefore incorrect: both equilibrium income and the government budget surplus increase.



3. Critically comment on the two theories that, according to Paul Krugman, conservative politicians tend to use to justify cutting taxes.

According to Krugman, conservative politicians have used two theories to justify cutting taxes: 1) supply-side economics; and 2) starving-the-beast.

The basic tenet of supply-side economics is the belief that a tax cut will pay for itself. Indeed, proponents of this theory believe that a tax cut will have such an expansionary effect on national income that government revenues will end up growing by more than the initial reduction in taxes. A win-win situation: a tax cut will both increase GDP and reduce the government budget deficit!

Krugman argues that those who he calls “conservative insiders” have exploited this theory for their benefit but without taking it too seriously, implying that intelligent and knowledgeable people cannot actually believe such a nonsense – that a reduction in taxes actually decreases the deficit!

The true tax-cut theory of the *conservative insiders* is the so-called “starving-the-beast” theory, says Krugman. Proponents of this theory argue that tax cuts should be implemented not because they will not create budget deficits, but because they certainly will. The expectation is that budget deficits will eventually lead to spending cuts, thus achieving the real objective of the *conservative insiders*: the reduction of the size of the government, i.e., the elimination or privatization of many of the services the government currently provides.

Therefore, to determine what interest groups are behind tax-cut proposals, we need to identify who actually benefits from a reduction in the size of the government. First of all, it appears that those who gain from smaller government are those who actually pay taxes – i.e., the relatively more affluent – but do not benefit directly – although they do indirectly due to externalities – from some types of government expenditure (e.g., in social services). Secondly, another identifiable group gaining from smaller governments are the businesses benefiting from the process of privatization, i.e., those that will provide the services until now delivered by the government.

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