ECO 209Y MACROECONOMIC THEORY AND POLICY							
SOLUTIONS	Terr	n Test #1			X		
LAST NAME							
FIRST NAME							
STUDEN	T NUMBER		S				
Indicate your	section of the co	urse:					
☐ Tuesday, ∕	10-12 – L0101		Tuesda	y, 2-4 – L02	01		
□ Wednesda	ny, 2-4 – L0301		Thursda	ay, 2-4 – L04	401		
INSTRUCTIONS	<u>i</u> :						
 The total time for this test is 1 hour and 45 minutes. Aids allowed: a <u>simple</u>, non-programmable calculator. Use <u>pen</u> instead of <u>pencil</u>. 							
	DO NOT WR	TE IN THIS SPA	ACE				
Part I	/30	Pa	art III	1	/10		
Part II	/20			2	/10		
				3	/10		
TOTAL	/80						

PART I (30 marks)

Instructions:

- Enter your answer to each question in the table below.
- Each correct answer is worth 3 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	9	10	
Α	В	С	В	Е	D	Α	D	E	C	

- 1. Consider an economy without depreciation of the capital stock and where personal income tax is the only source of government revenue. If private saving equals private investment and the government has a negative budget surplus, which of the following is true?
 - A) C + I + G > Y. B) C + I + G = Y.
 - C) C + I + G < Y.
 - D) X > Q.
 - E) X = Q.
- 2. Suppose that an economy produces only apples, bananas, and oranges, and that prices (in dollars) and quantities (in millions of pounds) are as shown in the following table:

Good	Year	2012	Year 2013		
	Quantity	Price	Quantity	Price	
Apples	20	\$5	16	\$4	
Bananas	10	\$7	12	\$9	
Oranges	5	\$10	6	\$12	

Using the chain method of estimating real GDP, between 2012 and 2013 real GDP increased by approximately

- A) 3.5 percent.
- B) 4.0 percent.
- C) 5.0 percent.
- D) 6.5 percent.
- E) 8.0 percent.

Use this space for rough work.

- Janet's photocopy shop has revenues of \$12,000 a month. Janet has monthly expenses of \$500 in taxes, \$200 in interest on a business loan, \$3,500 in paper, \$2,000 in ink-cartridges, \$2,500 in wages, and \$1,000 in rent. Her monthly profit is \$2,300. What is Janet's monthly contribution to GDP?
 - A) \$3,700.
 - B) \$6,000.
 - C) \$6,500.
 - D) \$9,700.
 - E) \$12,000.
- 4. Nominal GDP was \$975.0 billion in 2010, and it was \$1064.7 billion in 2013. The GDP deflator was 125 in 2010 and 130 in 2013. Rounding off to the nearest percentage point, what was the percent change in real GDP between 2010 and 2013?
 - A) 3 percent.
 - B) 5 percent.
 - C) 7 percent.
 - D) 10 percent.
 - E) 15 percent.
- 5. The economic crisis continues in the euro zone GDP is still lower than in 2008 and the rate of unemployment exceeds 10 percent in most countries. In a recent op-ed, Cristopher Ragan indicated that the implementation of wrong government policies has contributed to this situation. In his view, which of the following policies might be partly responsible for the current situation in the euro zone?
 - A) Increases in government spending resulting in structural deficits.
 - B) The European Central Bank setting the rate of interest too high.
 - C) Large increases in the money supply resulting in inflationary pressure.
 - D) Lower consumer and business confidence due to unsustainable government debt.
 - E) The implementation of austerity measures to reduce government deficits.
- 6. Consider the *AE* model of a closed economy with an expenditure multiplier (α_{AE}) equal to 2.5 and a marginal propensity to consume out of disposable income (*c*) equal to 0.8. If government purchases (*G*) increases by \$100 million, the government budget surplus will decrease by
 - A) \$100 million.
 - B) \$75 million.
 - C) \$62.5 million.
 - D) \$37.5 million.
 - E) \$35.5 million.

Use this space for rough work.

- 7. International Monetary Fund managing director Christine Lagarde recently made a blunt call for the U.S. and German governments to do more to improve their economies and the world economy. In her view, what should the governments of these two countries do?
 - A) Increase expenditure on infrastructure even at the cost of higher deficits.
 - B) Reduce the rate of interest to increase consumption and investment.
 - C) Reduce corporate taxes to increase investment.
 - D) Reduce income taxes to raise consumption expenditure.
 - E) Reduce government deficits to increase private confidence.
- 8. Consider a hypothetical open economy with a marginal propensity to import (*m*) equal to 0.15 and an aggregate expenditure multiplier (α_{AE}) equal to 4.00. If the marginal propensity to import (*m*) fell to 0.10, the aggregate expenditure multiplier (α_{AE}) would now be
 - A) 7.50.
 - B) 5.50.
 - Ć) 5.25.
 - D) 5.00.
 - E) 4.50.
- 9. Which of the following would cause the IS curve to shift inwards?
 - A) An increase in autonomous investment.
 - B) An increase in the rate of interest.
 - C) A decrease in autonomous imports.
 - D) A decrease in the rate of interest.
 - E) An increase in autonomous private savings.
- 10. Consider the *IS-LM* model of a closed economy, and suppose that consumption decreases as the interest rate increases. The slope of the *IS* curve
 - A) will be steeper the larger the interest sensitive of consumption.
 - B) will be flatter the larger the interest sensitivity of consumption and the smaller interest sensitivity of investment.
 - C) will be steeper the smaller the interest sensitive of consumption.
 - D) does not depend on the interest sensitivity of consumption.
 - E) will be flatter the smaller the interest sensitivity of consumption and the larger the interest sensitivity of investment.

Use this space for rough work.

PART II (20 marks)

Consider a closed economy with fixed price level. This economy is characterized by the following equations (all dollar figures in billions):

C = 250 + 0.8 YD I = 140 - 20i G = 170 TA = 30 + 0.25 Y TR = 80 $Y_{fe} = 1400$

- a) As a function of *i*, what is the equation for the AE curve? (1 mark) As a function of *i*, what is the equation for equilibrium income (Y*)? (1 mark) If the central bank sets the rate of interest at 5 percent (i.e., *i* = 5), what is the level of Y*? (1 mark) What is the size of the aggregate expenditure multiplier (α_{AE})? (1 mark)
 - 1) Let's first find the equation for the AE curve:

AE = C + I + G

= (250 + 0.8YD) + (140 - 20i) + 170where YD = Y + TR - TA = Y + 80 - 30 - 0.25Y = 50 + 0.75Y= [250 + 0.8(50 + 0.75Y)] + (140 - 20i) + 170

= 250 + 40 + 140 + 170 + 0.6Y - 20i

= 600 + 0.6Y - 20i (1 mark)

- 2) To find Y^* we must equate Y and AE: Y = AE \rightarrow Y = 600 + 0.6Y - 20i \rightarrow 0.4Y = 600 - 20i \rightarrow Y* = 1500 - 50i (1 mark)
- 3) If *i* = 5, then **Y**^{*} = 1500 50 (5) = 1500 250 = 1250 (1 mark)
- 4) The expenditure multiplier is: $\alpha_{AE} = 1 / (1 0.6) = 1 / 0.4 = 2.5$ (1 mark)

- b) At the equilibrium of part a), what is the level of private savings (S)? What is the level of government savings (or budget surplus, BS)? What is the level of private investment (I)? What is the size of the structural budget surplus? (4 marks)
 - 1) Let's find the level of *S*, where S = YD C. At Y = 1250, YD = 50 + 0.75 (1250) = 50 + 937.5 = 987.5and C = 250 + 0.8 (987.5) = 250 + 790 = 1040. Therefore, S = YD - C = 987.5 - 1040 = -52.5 (1 mark)
 - 2) BS = TA G TR = 30 + 0.25 (1250) 170 80 = 30 + 312.5 170 80 = 92.5 (1 mark)
 - 3) l = 140 20(5) = 140 100 = 40 (1 mark)
 - 4) At Y_{fe} = 1400, the *BS* is: *BS_{fe}* = 30 + 0.25 (1400) - 170 - 80 = 30 + 350 - 170 - 80 = 130 (1 mark)

c) You have been hired as an economic advisor to the Minister of Finance. Given the situation of the economy and the budgetary situation of the government you have described above, what policy would you advise the Minister to implement? <u>Briefly explain</u>. (2 marks)

The economy is in recession since $Y^* = 1250$ and $Y_{fe} = 1400$, i.e., there is a recessionary gap equal to 150. At the same time, the government is running a *BS* = 92.5. During a recession it's expected that the government would be running a BD due to the low level of *Y* (and thus of *TA*), and not a *BS*.

Therefore, either *G* should increase or *TA* decrease to eliminate the structural *BS* and reactivate the economy through an increase in *AE*.

Given that consumer confidence might be low during recessions, it might be advisable to increase G rather than decrease TA. Indeed, during a recession it could be expected that a large fraction of any increase in YD resulting from the decrease in TA will be saved rather than spent. Therefore, since the government wants to increase AE, it might be better to increase G rather than decrease TA.

- d) All else equal, by how much should the government increase its purchases of goods and services (G) to move the economy to full employment (i.e., to Y_{fe} = 1400)? (2 marks) What will be the levels of private savings (S), government savings (BS), and private investment (I) at full employment? (3 marks)
 - 1) The recessionary gap is $\Delta Y = 150$ and $\Delta Y = \alpha_{AE} \Delta G$, where $\alpha_{AE} = 2.5$. Therefore, $\Delta G = \Delta Y / \alpha_{AE} = 150 / 2.5 = 60$ (2 marks)
 - 2) Since YD = 50 + 0.75 (1400) = 50 + 1050 = 1100and C = 250 + 0.8 (1100) = 250 + 880 = 1130, S = YD - C = 1100 - 1130 = -30 (1 mark)
 - 3) BS = TA G TR = 30 + 0.25 (1400) 230 80 = 30 + 350 230 80 = 70 (1 mark)
 - 4) / = 140 20(5) = 140 100 = 40 (1 mark)

- e) Go back to the equilibrium of part a) above. If the government decides to achieve full employment through a change in the rate of interest, at what level should the central bank set the rate of interest? (2 marks) What will be the levels of private savings (S), government savings (BS), and private investment (*I*) at full employment? (3 marks)
 - 1) From part a) we have that $Y^* = 1500 50i$ and thus $50i = 1500 Y^* \rightarrow i = 30 0.02 Y^*$. Therefore, at $Y^* = 1400$, i = 30 - 0.02 (1400) = 30 - 28 = 2. (2 marks)
 - 2) Since YD = 50 + 0.75 (1400) = 50 + 1050 = 1100and C = 250 + 0.8 (1100) = 250 + 880 = 1130, S = YD - C = 1100 - 1130 = -30 (1 mark)
 - 3) BS = TA G TR = 30 + 0.25 (1400) 170 80 = 30 + 350 170 80 = 130 (1 mark)
 4) I = 140 20(2) = 140 40 = 100 (1 mark)

PART III (30 marks)

Instructions: Answer the following three questions in the space provided. Each question is worth 10 marks.

1. Critically comment on the following statement:

"An increase in consumers' preference for foreign cars will lead to an increase in consumption expenditure, greater equilibrium income, and an increase in the government budget surplus."

(Show your answer with the help of a diagram and <u>explain</u> the economics. Consider the *AE* model of the economy developed in class.)

Let's first clarify that greater preference for foreign cars does not mean that consumers will now be buying more cars than before (i.e., an increase in consumption expenditure). It means rather that some consumers will now be buying foreign cars instead of domestic ones, i.e., that imports will increase at each level of Y (i.e., autonomous imports, \overline{Q} , will increase). The increase in imports (i.e., a decrease in net exports) means a fall in *AE*, and thus a fall in equilibrium income. This is shown in the diagram below.

Initially *AE* is given by the curve *AE*₁, and the initial equilibrium is at *Y*₁. As autonomous imports (\overline{Q}) increase, the *AE*₁ curve shifts down to *AE*₂ by exactly the increase in \overline{Q} . At *Y*₁ there is now an excess supply (i.e., *Y* > *AE*) and *Y* falls. Indeed, firms cannot sell everything they are producing and their inventories rise. This involuntary increase in inventories gives the signal to firms that they must adjust their production downwards — i.e., they will lay off workers, output will decrease and *Y* will move towards a lower equilibrium (*Y*₂). Note that the decrease in equilibrium *Y* is equal to $\Delta Y = \alpha_{AE} \Delta \overline{Q}$.

As Y falls towards Y_2 , then consumption (*C*) decreases as well (this represents a movement down along the AE_2 curve). The decrease in Y also causes government revenues (*TA*) to fall, and thus the government budget surplus (*BS*) decreases.

Therefore, the statement is incorrect. As a result of the increase in *Q*, *Y* will decrease and so will both *C* and *BS*.



2. Critically comment on the following statement:

"If the private sector decides to increase savings, then investment will increase and so will equilibrium income."

(Show your answer with the help of a diagram and <u>explain</u> the economics. Consider the *AE* model of the economy developed in class.)

If the private sector of the economy decides to increase its saving, then autonomous consumption (\overline{C}) will fall and so will *AE*. The decrease in *AE* at each level of income will create a situation of excess supply (Y > AE) in the economy and equilibrium Y will fall. This is shown in the diagram below.

The economy is initially in equilibrium at point Y_1 . As \overline{C} decreases, the AE_1 curve shifts down to AE_2 and a situation of excess supply arises at Y_1 . Therefore, firms start accumulating inventories in a manner which was not planned and thus *actual* investment increases. This represents an involuntary increase in investment, the result of firms not being able to sell what they have produced. Therefore, a situation of disequilibrium arises — Y > AE which implies that *actual* investment is greater than *desired* investment. In turn, the involuntary accumulation of inventories gives firms the signal that production should be adjusted downward. As workers are laid off and output decreases, so does Y and a new equilibrium is reached at Y_2 .

Therefore, if the private sector decides to increase saving, the outcome will be an involuntary increase in inventories (i.e., an increase in *actual* investment). But this is an undesirable increase in *unproductive* investment due to the lack of demand and it will result in a reduction in equilibrium income. The statement is thus incorrect.



3. Critically comment on the following statement:

"Since tax cuts boost private sector confidence, a \$1 decrease in taxes will have a greater expansionary effect than a \$1 increase in government purchases." (Show your answer with the help of a diagram and <u>explain</u> the economics. Consider the *AE* model of the economy developed in class.)

First of all, a tax cut will not necessarily translate into an increase in private sector confidence. It could be argued that it might help increasing confidence in the economy to the extent that it might cause the level of economic activity to rise. At the same time, since the tax cut will cause the government budget deficit to increase, it could also be argued that this might contribute to do the opposite: to reduce private sector confidence. So this part of the statement is at best uncertain.

Assuming confidence in the economy unchanged, let's examine next the respective impacts on equilibrium Y of an increase of \$1 in G and of a decrease of \$1 in \overline{T} .

On the one hand, an increase of \$1 in *G* directly increases autonomous *AE* by \$1 and through the multiplying process causes equilibrium income to increase further by \$1 times the expenditure multiplier, i.e., $\Delta Y = \alpha_{AE} \Delta G = \alpha_{AE}$ (\$1). This is shown in the diagram below by the shift of the *AE*₁ curve to *AE*₂, and equilibrium income increasing to *Y*₂.

On the other hand, a decrease of \$1 in autonomous taxes increases autonomous *AE* only indirectly and by a lesser amount. Indeed, the \$1 decrease in autonomous taxes directly increases *YD* by \$1 at all levels of *Y* (i.e., $\Delta YD = -\Delta \overline{T}$), but not all of this decrease in *YD* will translate into an increase in *C*. At all levels of *Y*, consumers will increase expenditure only by a fraction "*c*" of the increase in disposable income and thus autonomous expenditure will increase by $\Delta A\overline{E} = c \Delta YD = -c \Delta \overline{T} = -c (-\$1) = c \$1$. For instance, if c = 0.8, then a \$1 decrease in autonomous taxes will translate into a \$0.80 increase in autonomous *AE*. Therefore, equilibrium income will increase by $\Delta Y = \alpha_{AE} \Delta A\overline{E} = \alpha_{AE} (c \$1)$. This is shown in the diagram below by the shift of the *AE*₁ curve to *AE*₃ in this case, and equilibrium income increasing to Y₃.

Therefore, contrary to the statement, a \$1 increase in *G* will have a greater expansionary impact on *Y* than a \$1 decrease in autonomous taxes will.

