12 Questions (1-5 on front, 6-12 on back). 40 points total. Good luck

1. 4 points. You are given the following data for the economy of Canada. Compute the growth rate of real GDP in Canada between 2010 and 2011.

	Bacon prices	Bacon quantites	Beer prices	Beer quantities
2010	$20/pound	10 pounds	$40/case	20 cases
2011		12 pounds		19 cases

There are a few ways the students can do this. They can convert all goods to "bacon equivalents", all goods to "beer equivalents" or use the "expenditure share" method … all will give the same answer.

Using the bacon equivalent method:
In 2010, Canada produced 10 + ($40/$20)*20 = 50 units of bacon equivalents
In 2011, Canada produced 12 + ($40/$20)*19 = 50 units of bacon equivalents
Therefore the growth rate of real GDP was 0 percent.

2. 4 points. In the CPI release for March 2014, the rate of increase for all items in the CPI from March 2013 to March 2014 was 1.5 percent. The rate of increase of food and beverages was 1.7 percent with expenditure share 14.9 percent; the rate of increase of housing was 2.8 percent with expenditure share 41.45 percent; and the rate of increase of transportation was -1.2 percent with expenditure share 16.42 percent. Compute the growth rate of all times in the CPI excluding food and beverages, housing, and transportation.

The expenditure share on food and beverages + housing + transportation was 14.9+41.45+16.42 = 72.77 percent. Therefore the expenditure share on all other items was 27.23 percent.

The growth rate of all items in the CPI excluding food and beverages, housing, and transportation solves the following equation
(0.149)*1.7 + (0.4145)*2.8 + (0.1642)*(-1.2) + (0.2723)*(x) = 1.5

x = 1.039 percent.

3. 4 points. A US company buys 10 pairs of white shoes from a foreign supplier and pays $1 for each pair of shoes to the supplier. The company paints the shoes red and sells 7 pairs of red shoes to US consumers for $10 for each pair and ships 3 pairs of red shoes overseas to be sold in foreign markets at $5 for each pair. Define the accounting for these transactions for Consumption, Exports, Imports, and GDP in the National Income and Product Accounts.

M = $1 x 10 = $10
C = $10 x 7 = $70
X = $5 x 3 = $15
GDP = C + X – M = $75

4. <u>4 points.</u> You have been given the following information for the country of Costa Rica:

Year	Apple Prices	Apple Quantities	Banana Prices	Banana Quantities
2012	4	6	8	10
2013	5	7	9	11

Fill out the following table.

Year	Expenditures on Apples	Expenditures on Bananas	Nominal GDP
2012	4*6 = 24	8*10 = 80	24+80 = 104
2013	5*7 = 35	9*11 = 99	35+99 = 134

Finally, for the 2012-2013 period (a) determine the growth rate of real GDP using the "apple equivalent" method and (b) compute the inflation rate in Costa Rica using the "expenditure share" method.

<u>Real GDP</u>
Apple equivalents in 2012: 6 + 10*(8/4) = 26
Apple equivalents in 2013 (using 2012 prices): 7 + 11*(8/4) = 29
Growth rate of real GDP = (29-26)/26 = 11.5%

<u>Inflation</u>
2012 Expenditure share on apples = 24/104 = 23.08%
2012 Expenditure share on bananas = 80/104 = 76.92%
Percent change in apple prices = 1/4 = 25%
Percent change in banana prices = 1/8 = 12.5%

Calculation: (0.2308)*25% + (0.7692)*12.5 = 15.385%

No credit given if inflation computed as nominal GDP growth less real GDP growth.

5. <u>2 points.</u> Over the 1955-2010 period, on average what is the average share of aggregate expenditures attributable to private investment? What is the average share attributable to government spending? Answers will be judged as correct if within a few percentage points.

Investment share … anywhere between 12 and 20 percent is OK.
Government spending … anywhere between 15 and 25 percent is OK.

6. <u>4 points.</u> Dean can brew 25 kegs of beer per hour and can make 50 wedges of cheese per hour. Randy can brew 20 kegs of beer per hour and can make 55 wedges of cheese per hour. Dean and Randy each work 8 hours per day. For both Dean and Randy
   a. Determine the price of one keg of beer in wedges of cheese.
   b. Determine the price of one wedge of cheese in kegs of beer.

<u>Dean</u>

If Dean wants	25	more kegs this costs	50 wedges of cheese.
	1	more keg this costs	50/25 = 2.0 wedges of cheese
If Dean wants	50	more cheese this costs	25 kegs
	1	more cheese this costs	25/50 = 0.5 kegs

<u>Randy</u>

If Randy wants	20	more kegs this costs	55 wedges of cheese.
	1	more keg this costs	55/20 = 2.75 wedges of cheese
If Randy wants	55	more cheese this costs	20 kegs
	1	more cheese this costs	20/55 = 0.364 kegs

Price of one

	beer	cheese
Dean	2.0 cheese	0.5 beer
Randy	2.75 cheese	0.364 beer

7. <u>1 point.</u> Who has the absolute advantage in each good? Who has the comparative advantage in each good? Why?

Dean has absolute advantage in beer (he brews more per hour than Randy) and Randy has the absolute advantage in cheese (he makes more cheese per hour than Dean). Dean has comparative advantage in beer (his price is lower than Randy's) and Randy has comparative advantage in cheese (his price is lower than Dean's).

8. <u>4 points.</u> A trader named "Kenny" appears. Using the method described in class and the videos, propose a trade in which Kenny makes profits.

Kenny buys one beer from Dean for 2.1 cheese (anything more than 2) and sells the one beer to Randy for 2.7 cheese (anything less than 2.75).

Or, Kenny buys one cheese from Randy for 0.37 beer (anything more than 0.364) and sells the cheese to Dean for 0.49 beer (anything less than 0.50).

9. 4 points. The US can make 100 units of consumption today (C_t) per hour and 110 units of future consumption (C_{t+1}) per hour. Germany can make 80 units of C_t per hour and 86 units of C_{t+1} per hour. For both the US and Germany,
    a. Determine the price of one unit of C_t in units of C_{t+1}
    b. Determine the price of one unit of C_{t+1} in units of C_t

US
If US wants	100	more Ct this costs	110 Ct+1
	1	more Ct this costs	110/100 = 1.1 Ct+1
If US wants	110	more Ct+1 this costs	100 Ct
	1	more Ct+1 this costs	100/110 = 0.909 Ct

Germany
If Germ wants	80	more Ct this costs	86 Ct+1
	1	more Ct this costs	86/80 = 1.075 Ct+1
If Germ wants	86	more Ct+1 this costs	80 Ct
	1	more Ct+1 this costs	80/86 = 0.93 Ct

	Price of one	
	Ct	Ct+1
US	1.10 Ct+1	0.909 Ct
Germ	1.075 Ct+1	0.93 Ct

10. 1 point. Who has the absolute advantage in the production of each good? Who has the comparative advantage in each good? Why?

    US has absolute advantage in both goods, since it can produce more per hour. US has comparative advantage in Ct+1 (lower price) and Germany has comparative advantage in Ct (lower price)

11. 4 points. A trader named "Kenny" appears. Using the method described in class and the videos, propose a trade in which Kenny makes profits.

    Kenny buys one Ct from Germany for 1.08 Ct+1 (anything more than 1.075) and sells the one Ct to the US for 1.09 Ct+1 (anything less than 1.10). Or, Kenny buys one Ct+1 from US for 0.91 (anything more than 0.909) and sells the one Ct+1 to Germany for 0.92 (anything less than 0.93).

12. <u>4 points.</u> Suppose the U.S. does not like the current pattern of trade flows and wants to export what it is currently importing. Determine the minimum tax rate that the U.S. imposes on production of either C_t or C_{t+1} such that the U.S. achieves its objective.

After trade, the US imports Ct and exports Ct+1. This means the US is running a trade deficit. For the US to run a trade surplus, it must export Ct. To export Ct, its price must be less than the German price of 1.075.

Since the US makes 100 Ct per hour, this means that (after tax) it cannot make more than 107.5 per hour Ct+1. That is

| If US wants | 100 | more Ct this costs (after tax) | 107.5 Ct+1 |
| | 1 | more Ct costs (after tax) | 107.5/100 = 1.075 Ct+1 |

Since, prior to the tax, the US produced 110 per hour, this means the minimum tax is 2.5 per hour. The effective minimum tax rate is therefore 2.5/110 = 2.27%