A. (10pts) Identify and label each of the following transactions when measuring Canada's GDP as C, I, G, X, M or N (for none of the above). Some transactions may require more than one label.

1. ___ N ___ A butcher shop in Vancouver hires more workers to keep up with the demand.
2. ___ N ___ An owner retires and sells his butcher shop to a new butcher.
3. ___ X-M ___ The Vancouver butcher buys meat from an American company.
4. ___ M ___ The government hires more workers to keep up with their workload.
5. ___ G ___ Identify and label each of the following transactions when measuring Canada's GDP as C, I, G, X, M or N (for none of the above). Some transactions may require more than one label.

B. (4pts) If the GDP is $856.4 and the capacity of the economy is $863.2, is this a recessionary gap or an inflationary gap? How large is the output gap?

\[ \text{Recessionary Gap} = 856.4 - 863.2 = -6.8 \]

C. (12pts) In our economy, the unemployment rate is 4.8%, the population is 54.6m, there are 26.4m employed and 7.4m are non-participants.

1. ___ M ___ How many people are unemployed?
2. ___ 7.8% ___ What is the participation rate?
3. ___ 19.5m ___ How many people are unable to work?

D. (16pts) In our economy we only produce three goods. Assume the 2013 is the base year.

<table>
<thead>
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<th>Price of A</th>
<th>Quantity of A</th>
<th>Price of B</th>
<th>Quantity of B</th>
<th>Price of C</th>
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<td>8</td>
<td>2</td>
<td>10</td>
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<td>2014</td>
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<td>13</td>
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1. ___ 26.5% ___ What is the nominal growth rate in 2014? \( \left( \frac{1.048}{1.052} - 1 \right) \times 100 \)
2. ___ 20.2% ___ What is the real growth rate in 2013? \( \left( \frac{1.020}{1.025} - 1 \right) \times 100 \)
3. ___ 85.8% ___ What is the CPI for 2012? \( \left( \frac{1.07}{1.13} \right) \times 100 \)
4. ___ 97.9% ___ What is the GDP deflator of 2014? \( \left( \frac{1.13}{1.146} \right) \times 100 \)

E. (8pts) Real vs Nominal. In 2014 the GDP measured in current dollars is $465.2bn and measured in 2012 dollars is $388.4bn. In the following year, the inflation rate was 4.2% and the GDP measured in current dollars is up 5.8%.

1. ___ 1.5% ___ What is the EXACT real growth rate?
2. ___ 306.0 ___ If you borrowed 300 units of rice in 2014, how many EXACT units of rice should you return next year to end your debt if the price of rice rises by the same rate as the inflation rate and the nominal interest is 6.3%?
A. (16 pts) Keynesian Cross Model: Let $C=250+0.8Y_d$, $T=2Y$, $I=200$, $G=100$. $X=M=50-0.04Y$.

1. $\frac{Y}{2} = 250 + 0.8Y_d$ When $Y=1000$, what is the APC (average propensity to consume)?

2. $-100 + 1.125Y = Y_d$ When $Y=1000$, what is the APS (average propensity to save)?

3. $600 + 6Y$ What is the AE (aggregate expenditure) equation?

4. $1200$ What is the AE (aggregate expenditure) when $Y=1000$?

5. $1500$ What equilibrium $Y$ for this economy?

2. 6. Draw a rough diagram, showing AE (both intercept and slope) and equilibrium.

6. $\frac{Y}{-10}$ At equilibrium, what is $S$ (private savings)?

7. $-200 + 2Y_d$ At equilibrium, what is $S_{GOV}$ (government surplus or deficit)?

8. $\frac{2}{5}$ What is the multiplier?

9. $X = 90$ Suppose we want $Y$ to be 1600 and the variable you can change is $X$. What should $X$ be if you want equilibrium $Y$ to be 1600?

B. (10 pts) Aggregate Demand & Supply: Suppose the AE (aggregate expenditure) equation is the same as above but with this variable added: $AE=A_0 + aY + 1000/P$ (Where 1000 could be your money wealth)

1. $Y=1750$ What is equilibrium $Y$ if $P=10$?

2. $Y_{AD} = 1500 + 2500/P$ What is the $Y_{AD}$ equation? ($Y=f(P)$)

3. $P=5$, $Y=2000$ What is equilibrium $Y$ and $P$, if $Y_{AD}=1000+200P$ (HINT: $-b+\sqrt{(b^2-4ac)}/2a$)

4. $Y_{AD} = 2250 + 2500/P$ What is the new $Y_{AD}$ equation if $G$ increases to 415? $g_{NS}=315$

5. $P=8$, $Y=2600$ What is the new equilibrium $Y$ and $P$, if $Y_{AD}=1000+200P$?

C. (4 pts) Adjustment to the Long Run. Suppose $Y^*=2500$ and the original $Y_{AD}$ (B#3 when $G=100$) holds.

1. $\frac{-1}{2}$ Is this an inflationary gap or recessionary gap?

2. Draw a rough diagram, showing the inflationary or recessionary gap.

D. (10 pts) If we just wait……

1. Describe how the economy will adjust to this gap.

When we have fully adjusted:

2. $Y=2500$, $P=2.5$ What will $Y$ & $P$ be?

3. $Y_{AD} = 2166.7$ + $2500/P$ What is the new $Y_{AD}$?

4. $Y_{AS} = 2000 + 2500/P$ What is the new $Y_{AS}$? (assuming the slope remains same as before)

2. Show this in a diagram.

E. (10 pts) Some economists say that this adjustment process is too painful and prefer to use "fiscal policy" to close the gap. If the right fiscal policy is used:

1. $G = 316.7\frac{5}{8}$ What is the new $G$?

2. $Y=2500$, $P=.75$ What will $Y$ & $P$ be?

3. $Y_{AD} = 2166.7$ + $2500/P$ What is the new $Y_{AD}$? (assuming the slope of $AE$ remains the same)

4. $Y_{AS} = 2000 + 2500/P$ What is the new $Y_{AS}$?

2. Show this in a diagram.
MACROECONOMICS 105 QUIZ #3 10 November 2015 NAME ANSWERS

You MUST show your work clearly for full credit.

A. \[ 28,100 \] (2 pts) The total amount of cash in our country’s banks is \$3000. The total amount of cash in consumers’ pockets is \$4000. The total amount of cash in business’s registers (tills) is \$2000. Banks report that consumers have \$10,000 in checking accounts and \$3000 in savings accounts. Non-bank businesses have \$7000 in checking accounts and \$1500 in savings accounts. Consumers have outstanding balances of \$8000 on their credit cards and \$100 worth of gold in their homes. How much M2 does this economy have?

B. Present Value and Interest Rates (6 pts)

1. \[ 1.053, 460.24 \] What is the price of a 3 year \$1 million bond with a coupon rate of 8% (the interest the borrower promises to pay to the bond holder each year at the end of the year) if the current interest rate is 6%?

2. \[ 10\% \] What is the yield on a one year \$1 million bond with a coupon rate of 8% if that bond can be purchased for \$981,818.18? (Yes the bond will pay 8% at the end of the year).

C. (12 pts) No leakages. Suppose our economy starts with \$1000 of cash in consumer’s pockets. Then a bank opens and the bank has a target reserve ratio (\(v\)) of 40%. Assume that consumers deposit any cash they receive back into the bank.

1. Show a T-account (sub-total) for this bank at the end of the first round (after the bank makes its first loan).

2. Show a T-account for this bank at the end of the third round. (This is the subtotal at the end of 3rd round)

3. Show the long run T-account for this bank.

4. \[ \frac{1}{v} = \frac{1}{0.4} = 2.5 \] What is the deposit multiplier for this economy?

D. (20 pts) Bringing Money into the Macro Model: Suppose \( I = 380 - 800r \) and \( M_d = 800 - 500r \).

1. \[ \frac{M_d}{M} = \frac{10\%}{50\%} = 0.2 \] \( I = 300 \) What will \( r \) and \( I \) be if \( M_s = 750 \).

2. \[ \Delta M = \frac{4(25)}{10} = 10 \] \( M = 760 \) Using your answer to C#4 above, what will the new \( M_s \) be if the central bank injects \$4 of new deposits into the banking system? (For the old \( M_s \) use 750 and not your answer from C#3)

3. \[ r = \frac{400}{500} = 8\% \] \( I = 316 \) (\( \Delta I = 46 \)) What will the new \( r \) and new \( I \) be after this injection?

Suppose \( A-B = 800 + 2Y - 4P \) and \( Y_{As} = 600 + 5P \) \( \Rightarrow Y = 360 - 4P \)

4. \( Y_{AD} = 1000 - 5P \) What is the equation for \( Y_{AD} \)?

5. \[ P = \frac{400}{40} = 10 \] \( Y = 800 \) What is equilibrium \( Y \) & \( P \)?

Now the central bank injects \$4 of new deposits into the banking system. (you can calculate \( \Delta I \) from your answer to D#3)

6. \[ Y_{AD} = 1020 - 5P \] \[ P = \frac{420}{20} = 21 \] \( Y = 810 \) What is the new \( Y_{AD} \), \( Y \) and \( P \)?

E. (10 pts) Adding leakages. Suppose banks have a target reserve ratio (\( v \)) of 40% and consumers have a cash withdrawal ratio (\( c \)) of 10%.

1. \[ \frac{M_d}{M} = \frac{2(20)}{10} = 7.7 \] What is the new \( M_s \) if the central bank injects \$10 of new deposits into the banking system? (For the old \( M_s \) use 750 not your answer to C#3. Also use the deposit multiplier formula from our textbook.)

2. \[ r = \frac{36}{50} = 6\% \] \( I = 332 \) (\( \Delta I = 32 \)) What is the new \( r \) and the \( \Delta I \) caused by this injection? (\( I = 380 - 800r \) and \( M_d = 800 - 500r \))

3. \( Y_{AD} = 1040 - 5P \) \( P = \frac{440}{10} = 44 \) What is the new \( Y_{AD} \), \( Y \) and \( P \) (if \( A-B = 800 + 2Y - 4P \) and \( Y_{As} = 600 + 5P \)) caused by this injection? \( Y = 820 \)
1. Inflation (7 pts)
Our models can explain a one-time increase in the price level (as a one-time shift of \( Y_{AD} \) or \( Y_{AS} \)) but to explain inflation we need a model to show a persistent change in \( Y_{AD} \) or \( Y_{AS} \).

2 a. Why would \( Y_{AS} \) keep shifting (right or left?) to cause inflation?
2 b. Why would \( Y_{AD} \) keep shifting (right or left?) to cause inflation?
3 c. In a diagram with \( Y_{AD} \) or \( Y_{AS} \) label step 1, step 2, step 3, step 4, etc., that would give us inflation.

2. Unemployment (6 pts)
2 a. Draw a Phillips curve and mark on this curve with an "X" the inflation that an economy will expect at the "natural rate of unemployment".
2 b. How will the Phillips curve adjust if the expected inflation rate increases? Draw the new Phillips curve in the same diagram when \( \%\Delta P = 5\% \) when originally \( \%\Delta P = 2\% \).

3. Budget Deficit Function (6 pts) Suppose \( G = 600, \) Debt= 2000, \( i \) (interest on government debt)=5% and \( T=0.4Y \)
2 a. \( -100 (\text{interest}=100) \) What is the deficit if \( Y=2000? \)
2 b. \( 60 (\text{interest}=60) \) What is the cyclically adjusted deficit if \( Y^*=1600? \)
2 c. \( \expansionary/contractionary \) (expansionary/contractionary) Is the fiscal stance of this economy expansionary or contractionary?

4. Comparative Advantage (19 pts)
On island A, we can produce 20 units of wheat or up to 80 units of cloth. On island B, we can produce 60 units of wheat or 20 units of cloth (assume constant opportunity costs on both islands). On both islands, people like wheat just as much as cloth (they won't to consume equal amounts of both goods).
3 a. \( C=16=W \) How many units of wheat and cloth will they produce and consume on A before trade?
3 b. \( C=15=W \) How many units of wheat and cloth will they produce and consume on B before trade?
3 c. Draw the world production possibility curve.
3 d. \( w=4, \) \( C=64 \) If the two countries are going to trade with each other what will island A produce?
3 e. \( 60+w, \) \( C=0 \) If the two countries are going to trade with each other what will island B produce?
3 f. \(+112.5\% \) What is the percentage gain for island A from free trade?
3 g. \(-100\% \) What is the percentage gain for island B from free trade?

5. (4 pts) Trade and Tariffs
There is a product (cheese) where the demand in Canada is \( Q_d=30-2P \).
Domestic producers are willing to produce cheese at \( Q_s=5+3P \). Then we have free trade and foreign importers are willing to sell us their cheese at a price of $2. Except that the government to protect local producers has put a 100% tariff on foreign imports. What is the dead weight loss (in dollars) caused by this tariff?

6. (8 pts) How will each of the following transactions be recorded in Canada's balance of payments. You must tell me whether it is CA or KA and whether it is a debit (+) or credit (-).
2 a. \( C A \) Canadians take an increased amount of trips to foreign destinations.
2 b. \( C A \) Burger King (which is now a Canadian company) has increased profits around the world.
2 c. \( K A \) Burger King (a Canadian company) borrows from a Canadian bank to expand their chain in other countries.
2 d. \( K A \) The Bank of Canada reduces its holdings of foreign reserves.
1. a) Yes, keep shifting left, either because $x > y^*$ (inflation gap) or 
because $r^p$ rises, increasing and companies find 
they can keep workers unless they keep raising wages 
and they are willing to go so only if they raise the price of 
what they sell.

b) Yes, keep shifting right, either because 
companies want to stimulate economy above the low level and 
wants to stimulate economy above that low level or 
central bank actions in advance. GDP is prevent a long recession adjustment 
as $y^p$ adjust to lower levels.

2. 

3. 

1. Govt stimulat economy to reach $y^*$
2. $r^p$ rises, $y^*$ shifts left
3. $y^*$ shifts left because of inflicting gap
4. Central bank wants to stimulate $y^*$
5. Govt re-stimulate economy to reach $y^*$
6. $r^p$ rises again
7. Repeat

2. a) 

$x^* \rightarrow 1000U^2U^2, y^p=5\% \Rightarrow 2\%$

1. Surprisingly, $y^p=2 > 2\%$, $r^p=0$
2. $2\% > 2\%$ 
3. People begin to expect $y^p=5\%$

3. $a = \frac{700}{600 + 2000 (0.5) - 0.4Y}$

4. $400 = 100u$, $U = \frac{400}{100}$

5. $400 = 100 + 10u$, $u = 30$

6. $30 + 100 = 130$, $y = 700$