MACROECONOMICS 105  
COLUMBIA COLLEGE

You have 55 minutes. Place answer ON EXAM in the space provided. SHOW YOUR WORK!

A. Multiple Choice (40 pts)

1. Suppose C+I+G+X-M is greater than Domestic Income + Depreciation + Net Indirect Taxes. Then:
   A. GDP is greater than GDE.
   B. GDP is greater than GDR.
   C. GNP is greater than GDP. ?
   D. GDR is greater than GDE. X
   E. GDP is greater than GNP. X

2. Suppose the CA is negative and SGov is positive. Then:
   A. (SPriv-l) must be more negative than CA.
   B. (SPriv-l) must be more positive than SGov.
   C. (SPriv-l) is positive, but not as large as SGov
   D. (SPriv-l) is negative but not as large a deficit as CA.
   E. We can't tell if (SPriv-l) is positive or negative.

3. A company is trying to decide whether to hire a certain worker. They should hire the worker if:
   A. The worker's MPN is greater than his MRPN.
   B. The increase in production is greater than his MRPN.
   C. The worker's MPN is greater than his wage rate.
   D. The worker's wage rate is greater than his MPN.
   E. The real wage (in coconuts) is greater than his MPN.

4. Suppose the number of people unemployed stays the same but the country's participation rate rises. What is likely to happen:
   A. The size of the civilian non-institutional population must have increased. ?
   B. The unemployment rate will likely increase.
   C. The unemployment rate will likely decrease.
   D. The number of non-participants must have increased. X
   E. The natural rate of unemployment must have increased. X

5. When government spending increases:
   A. Private savings rise more than government savings decrease. X
   B. Both private savings and government savings decrease. X
   C. Government savings decrease more than private savings rise.
   D. Both private savings and government savings increase.
   E. Private savings decrease more than government savings rise.

6. In a closed economy, what happens if there is an increase expected future earnings?
   A. Interest rates will fall while equilibrium savings and investment both increase.
   B. Interest rates will fall while equilibrium savings decrease and equilibrium investment increases.
   C. Interest rates will rise when savings decreases but investment doesn't change.
   D. Interest rates will rise while equilibrium savings and investment both decrease.
   E. An uncertain change in the interest rates because equilibrium savings falls while equilibrium investment rises.

7. In a small open economy, what happens if there is an increase in the tax on capital (τ)?
   A. Interest rates will rise. X
   B. Absorption will decrease.
   C. Either we will export less savings or export more savings.
   D. The capital account will move in a positive direction. X
   E. Domestic consumption will decrease. X
8. Which of the following will appear as a credit (negative sign) in the capital account?
   A. More of our local industry comes under foreign control.
   B. An increase in the lending by our domestic banks to foreign businesses.
   C. A decrease in the central banks holdings of international reserves.
   D. An increase in investment income earned by people who don't live in our country.
   E. A businessman with lots of assets around the world decides to immigrate to our country.

9. Suppose the elasticity of output with respect to capital and labour are 0.3 and 0.7. If capital grows at 5%, labour grows at 2% and the economy grows by 4.4%, what is the growth of general factor productivity?
   A. 0.3%
   B. 2.6%
   C. 11.4%

10. Suppose at a certain level of k that I/N is greater than (n + δ)k. Then:
    A. This is not possible because I/N is equal to (n + δ)k.
    B. General factor productivity must be increasing.
    C. y will be smaller next year.
    D. For a constant savings rate, I/N will be larger next year.
    E. Savings must be larger than investment.

B. Calculations (50 pts) SHOW YOUR WORK CLEARLY!! (on attached sheets if there is no room on test)

1. (8 pts) The participation rate is 70%, the unemployment rate is 10% and there are 50 million in the labour force in a population of 90 million.
   A. \( \frac{90 - 71.43}{18.57} \) How many people are not able to work?
   B. \( \frac{71.43 - 50}{21.43} \) How many people are able to work but have something better to do with their time?

2. (10 pts) Let \( Y=100N-5N^2 \), \( Py=2 \), \( Ns=(w/5) \), \( Pk=40 \), n=5%, machines last 4 years and the interest rate is 15%.
   A. \( \frac{2e^{0.25}}{4} = 40 \) \( N=8 \) What is the equilibrium wage rate?
   B. \( \frac{2e^{0.25}}{4} = 640 \) How much profit is made at the equilibrium level of employment?

3. (16 pts) Let \( y=30k^{1/2} \), \( S=0.3Y \), Machines last four years, the interest rate is 15% the population grows at 5%, \( Py=2 \) and \( Ns=(w/5) \)
   A. \( k=900 \) \( y=900 \) \( c=7(900)=630 \) What is the equilibrium level of k, y and c?
   B. \( k_{t+1} = 661.9 \) If I/N=20 at equilibrium, what will k be next year?
   C. \( k = 3500 \) To get the maximum equilibrium level of c, what must k be?
   D. \( \frac{15}{30} = 0.5 \) What must the savings rate be for this economy to be in equilibrium at the maximum level of c?

4. \( \frac{3(250)}{50} = 30 \) \( 50 = k^2 \)
8. Which of the following will appear as a credit (negative sign) in the capital account?
   A. More of our local industry comes under foreign control.
   B. An increase in the lending by our domestic banks to foreign businesses.
   C. A decrease in the central banks holdings of international reserves.
   D. An increase in investment income earned by people who don’t live in our country.
   E. A businessman with lots of assets around the world decides to immigrate to our country.

9. Suppose the elasticity of output with respect to capital and labour are 0.3 and 0.7. If capital grows at 5%, labour grows at 2% and the economy grows by 4.4%, what is the growth of general factor productivity?
   A. 0.3%  B. 1.5%  C. 2.6%  D. 7.0%  E. 11.4%

10. Suppose at a certain level of k that I/N is greater than (n + δ)k. Then:
    A. This is not possible because I/N is equal to (n + δ)k.  
    B. General factor productivity must be increasing.  
    C. y will be smaller next year.  
    D. For a constant savings rate, I/N will be larger next year.  
    E. Savings must be larger than investment.

B. Calculations (50 pts) SHOW YOUR WORK CLEARLY!! (on attached sheets if there is no room on test)

1. (8 pts) The participation rate is 70%, the unemployment rate is 10% and there are 50 million in the labour force in a population of 90 million.
   A. \[ \frac{70}{100} = 18.57 \text{ m} \] How many people are not able to work? \[ \frac{512}{17} = 71.43 \text{ m} \] non-int
   B. \[ 71.43 - 50 = 21.43 \text{ m} \] How many people are able to work but have something better to do with their time?

2. (10 pts) Let \( Y = 100N - 5N^2 \), \( Py = 2 \), \( Ns(w/5) \), \( Pk=40 \), \( n=5\% \), machines last 4 years and the interest rate is 15%.
   A. \[ w = \frac{200}{30} = 40 \] \[ n = 2 \] \[ N = 8 \] What is the equilibrium wage rate?
   B. \[ \frac{21(480) - 480}{12} \Rightarrow 640 \] How much profit is made at the equilibrium level of employment?

3. (16 pts) Let \( y = 30k^{1/2} \), \( S = 0.3Y \), Machines last four years, the interest rate is 15%, the population grows at 5%, \( Py = 2 \) and \( Ns(w/5) \)
   A. \[ k = 900 \] \[ y = 900 \] \[ c = 3(900) = 630 \] What is the equilibrium level of k, y and c?
   B. \[ k = 661.7 \] If I/N=20 at equilibrium, what will k be next year?
   C. \[ k = 2500 \] To get the maximum equilibrium level of c, what must k be?
   D. \[ k = \frac{30}{50} \] What must the savings rate be for this economy to be in equilibrium at the maximum level of c?
   \[ \lambda = \frac{3(2500)}{30(50)} = \frac{750}{1500} = 50\% \]
4. (16 pts) Imagine the whole world consists of two large open economies. Our economy has a current account surplus. Then our government decides to increase spending. What happens to the world interest rate? What happens to the current account in both countries. Draw interconnecting I/S diagrams showing how the change in our government spending affects both countries. Also show this in TWO “Box” diagrams (one for each country). Finally fill out the table below showing how the following six variables are affected by the increase in our country’s government spending.

| Variable | Change
|----------|--------
| A. Our economy | ↑ ↓ ↑ ↓ ↓ ↑
| B. The other large economy | ↑ ↓ ↓ ↑ ↑ ↓

C. Short Essay (10 pts) China is a large open economy. As their GDP increases, their domestic consumption is rising rapidly and taking a large proportion of their production. What effect does this increase in China’s consumption have on the world interest rate? What effect will this have on Canada’s current account (currently we have a small deficit), consumption, investment and savings. Explain.