PROBLEM SET 1
14.02 Macroeconomics
February 15, 2006
Due February 22, 2006

I.   **Answer each as True, False, or Uncertain, providing a few sentences of explanation for your choice.**

1. The annual growth rate of GDP was 0.8% in 2001, so the positive growth rate indicates there was in fact no "recession of 2001."

2. Last year, government spending (G) grew significantly. This was due partly to an increase in Social Security, welfare and Medicare payments as well as an increase in unemployment compensation.

3. The unemployment rate must go up when the economy slows down.

4. Deflation is desirable for an economy since decline in the price level improves real incomes in the economy.

5. Although both the GDP deflator and the CPI are measures of the price level, the two do not necessarily move together all the time. In both 1974 and in the late 1970s, the increase in the CPI was significantly larger than the increase in the GDP deflator.

6. The rich spend more than the poor since they have more income to spend, therefore a tax cut designed to revive the economy from a recession should be targeted towards the rich.

II.   **Short questions**

1. Consider an economy with three companies A, B, C. Company A grows oranges. Half of the oranges are used by Company B to produce orange juice. Company B exports part of its products and sells the rest to Company C. Company C is a retail store that distributes the juice manufactured by B in the domestic market and the rest of the oranges harvested by A. Below are balance sheets for all three companies for year 2005 and 2006.

Company A		2005		2006
Revenues from sale		$100		$200
Expenses		$50		$50
Wages	$50		$50	
Profits		$50		$150

Company B	2005		2006	
Revenues from sale		$200		$200
Expenses		$100		$150
Wages	$50		$50	
Orange purchases	$50		$100	
Profits		$100		$50

Company C	2005		2006	
Revenues from sale		$500		$600
Expenses		$150		$200
Juice purchases	$100		$100	
Orange purchases	$50		$100	
Profits		$350		$400

(a) Show three different ways to compute this economy's GDP in both 2005 and 2006.

(b) Suppose the number of the oranges and the amount of the orange juice produced are exactly the same for both years. Compute the rate of inflation from 2005 to 2006 based on the GDP deflator.

(c) In addition to (b), suppose all individuals in this economy consume only oranges and juices bought from Company C, and suppose Company C sells to consumers only. Compute the rate of inflation from 2005 to 2006 based on the Consumer Price Index.

2. Consider an economy whose GDP of $100 can be decomposed as follows: Private consumption = $40, Government consumption = $30, Private investment =$30.

   (a) Suppose G=T. Show that in this economy, saving = investment.

   (b) Suppose G≠T. Is saving=investment?

III. Long question

Suppose a closed economy is described as follows:
The consumption function is $C=c_0+c_1Y_D$
The investment (I) and the government spending (G) are exogenously determined. The government is running a balanced budget.

1. Write down the equilibrium condition for the goods market? What is the equilibrium output?

2. Derive an expression for the goods market multiplier and autonomous spending.

3. Compute the impact of increasing G on equilibrium output, i.e., derive an expression for $\Delta Y^*/\Delta G$ where Y^* is the equilibrium output. What is the multiplier? Explain why the multiplier is what it is.

4. Suppose the latest consumer survey reports a decrease in the willingness to save. Compute its impact on equilibrium output, i.e., derive an expression for $\Delta Y^*/\Delta s_1$ where Y^* is the equilibrium output and s_1 is the propensity to save. (Note: $s_1 + c_1 = 1$) What is the effect on equilibrium saving?

5. Suppose, instead of a lump-sum tax, the government collects a proportional tax, $T = tY$, and G remains constant. Redo (1) to (4). Compare and explain the difference.