14.02 Principles of Macroeconomics

Problem Set # 3, Questions

Posted during Week # 7, due on the last day of Week # 8.
You must staple a copy of this frontpage on your problem set. Remember to write down your name.

Name: _____

(Table is for corrector use only)

	1	2	3	4	5	6	7	Total
I						██	██	
II						██	██	
III								
Total	██	██	██	██	██	██	██	

Part I: True, False Questions. Decide whether each statement is true or false and justify your answer with a short argument. (6 points each, 30 points total)

1. Workers like inflation since it raises their wages.
2. Improvements in health that increase the elderly population, tend to increase the unemployment rate.
3. If the government increases G without altering the supply of money, the amount of money demanded in equilibrium varies since both Y and i change.
4. A monetary contraction cannot affect the public budget since it is not a fiscal policy.
5. As in microeconomics, the AS curve is upward slopping because producers sell more goods when the price is high.

Part II. IS/ LM Model (7 points each, 35 points total)

Suppose the population in the economy is divided into two groups. Although the two groups have equal amount of people, the richer one (Group A) gets 70% of total income and the poorer one (Group B) gets the remaining 30%. The economy is represented by the following equations.

(1) $$M^d = 5Y - 120r$$
(2) $$M^S = 10000$$

(3) $$I = 296 - 20i + 0.1Y$$
(4) $$C_A = 120 + c_A(Y_A - T_A)$$
(5) $$C_B = 60 + c_B(Y_B - T_B)$$
(6) $$G = 500$$

1. Assuming $c_A = c_B = 0.6$ and $T_A = T_B = 200$, derive the IS and LM curve and find the equilibrium level of output and interest rate and compute the fiscal budget. Use graphs and math.
2. The government wants to reduce the fiscal deficit, but it is worried about the negative consequences such a policy might have on the level of output. What combination of monetary and fiscal policies would you

recommend to decrease the deficit without provoking a recession? Explain graphically and give the intuition.
3. Assume now $c_A=0.4$ and $c_B=0.8$. Derive the IS and LM curve and find the equilibrium level of output and interest rate. Use graphs and math.
4. Explain the effect on output, interest rate, demand of money, amount of money and investment of a public transfer to Group B financed by an increase in the tax leveraged to Group A.
5. Explain the effect on output and interest rate of a more equal distribution of income

Part III. Labor Market (5 points each, 35 points total)

In a far away country, the total population is 1000 people (all of them non institutional civilian people), 564 are working and 36 are looking for a job.

1. What is the size of the labor force? What are the participation rate and unemployment rate?

In this economy, the labor productivity is 2. And the wage setting process is described by

$$W/P^e = Z - 200u$$

where Z is the unemployment insurance provided by the government and u is the unemployment rate.

2. What is the Price Setting equation for a mark-up level $\mu = 1$?
3. For $P^e = P$, what is the natural unemployment rate, natural level of employment and natural level of output if $Z = 10$? Use math and show the results qualitatively with a graph.

The government is running a fiscal surplus and they are debating whether to increase the unemployment benefits or provide day care for working mothers, which would allow 100 women to join the labor force.

4. Analyze the implications of a three dollars increase in the unemployment insurance on natural level of output, natural unemployment rate and natural level of employment. Use math, show the results qualitatively with a graph and provide intuition.
5. Analyze the implications of the mentioned increase in the labor force on the natural level of output, natural unemployment rate and natural

employment rate. Use math and show the results qualitatively with W/ P-u and W/ P-N graphs and provide intuition.

6. Analyze the implications of the mentioned decrease in unemployment-sensitivity of the real wage on the natural level of output, natural unemployment rate and natural level of employment. Use math, show the results qualitatively with a graph and provide intuition.

Finally, recognize that prices may turn out to be different from what it was expected.

7. Given the Price Setting equation and the Wage Setting equation, derive an equation for P as a function of P^e, Y and L. What happens with the AS curve when the wage setting process looses sensitivity with respect to the unemployment rate?