FIRST LETTER OF LAST NAME: _____

NAME _____ EMAIL: _____

D**ate Due**: **Thurs, 4/21/16, 2:30 PM**

HOMEWORK 5

**Important**: This assignment is due **at the beginning of class on Thursday, April 21.**

***If you pass in your assignment before class begins (2:30 PM) on Thursday, 4/21, you will receive 2 extra points on your assignment.**

Instructions: Please print off this assignment and fill in your answers by hand. Write legibly and **show all your work**. You can work together; however, you are expected to write up your answers individually.

This assignment consists of problem I and II and is worth a total of 20 participation points.

*****You can do one or both of these problems. *****

If you do one problem, total possible participation points earned are 10. If you choose to do both problems, total possible points earned will be 20. (You may want to check the gradebook to see how many participation points you need to meet the cap of 100.)

*If you cannot make it to class on 4/21, send your homework with a friend or turn it in early* during office hours (before 4/21) with your name and email clearly marked. (**Note:** We will not accept assignments that are sent via email. ***No late assignments* will be accepted**.)

_____

The following model of the U.S. economy will be used to solve for initial equilibrium points A for problems I and II.

## INITIAL GENERAL EQUILIBRIUM CONDITION, POINTS A

Production function: $Y = AKN - N^2/2$

$MPN = AK - N$
where: $A = 5$ and $K = 10$
$NS = 20 + 4w$

$C^d = 80 + 0.5 (Y - T) - 500r$
$I^d = 575 - 500r$
$G = 50$
$T = 100$

$M^d/P = 467 + 0.5Y - 1000 (r + \pi^e)$
where: $\pi^e = 3\%$ (0.03)
Nominal $M^s = 2000$

Homework 5, Page 2

a. Solve for the labor market equilibrium real wage, $\bar{w}$, the profit maximizing level of labor, $\bar{N}$, and the full employment level of output, $\bar{Y}$. Please show your work.

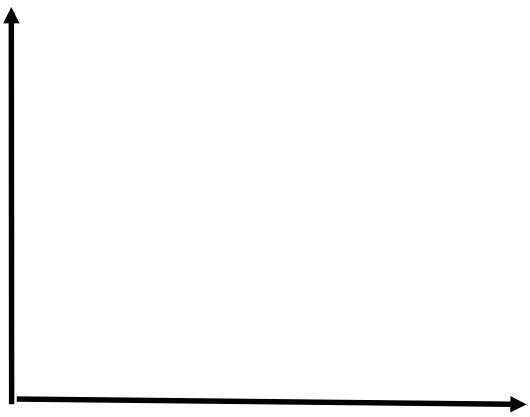
$\bar{w}$: _____

$\bar{N}$: _____

$\bar{Y}$: _____

Draw the production function: $Y = AKN - N^2/2$ in Graph A and the labor market in Graph B. (Both graphs are theoretical and do not have to be drawn to scale.) Be sure to label the axes and any curves/lines in the graphs. Identify labor market equilibrium point A at $\bar{w}$, $\bar{N}$ in Graph B and the corresponding level of output, $\bar{Y}$, in Graph A.

Graph A



Graph B

b. Derive an expression for the IS curve (r in terms of Y). Please show all work.

c. Find the real interest rate, r that clears the goods market. Please show all work.

r: _____

d. Solve for the price level that clears the money market. Please show all work.

P: _____

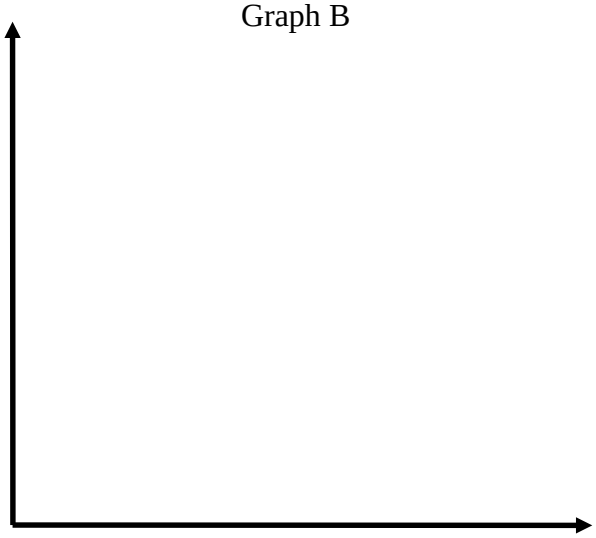
e. Derive the expression for the LM curve (r in terms of Y). Please show all work.

**PROBLEM I. A Shock to the Money Supply**

Please draw four separate diagrams and label initial equilibrium points A: Graph A: $S^d = I^d$ ; Graph B: FE/IS/LM; Graph C: $M^s/P = M^d/P$; Graph D: AD/SRAS/LRAS. Be sure to label all curves and the axes. (These are theoretical and do not have to be drawn to scale.)

Graph A

Graph B



Graph C

Graph D

Ia. Suppose the nominal money supply increases to: $M^s = 2100$. This shock is not the result of monetary policy (open market operations).

What are two possible reasons for this shock to the money supply? Explain carefully and intuitively.

Ib. Find the new, short run (Keynesian fixed price level) LM curve (r in terms of Y). Please show all work.

Ic. What is the short run (Keynesian fixed price) equilibrium output and real interest rate? Please show all work. Label the new short-run equilibrium points B in graphs A, B, C, and D.

r: _____

Y: _____

Ie. If the Federal Reserve does nothing how will the economy return to long-run equilibrium? Explain carefully and analytically below.

If. Find the new price level associated with the long-run general equilibrium (assuming Federal Reserve does nothing). Label long-run equilibrium points C on graphs A, B, C, and D.

P: _____

Ig. Suppose the Fed wanted to avoid any changes to the price level as a result of the shock. What does the Fed need to do in terms of open market operations so the price level remains at its initial level (points A and B in graphs A, B, C, D). Assume the money multiplier, mm = 2.5. (Be sure to include the size of the open market operation necessary and an explanation of how this will work to restore the original price level.)

Ih. What else could the Federal Reserve do besides open market operations so the price level remains at its initial value?

**PROBLEM II. A Shock to $I^d$**

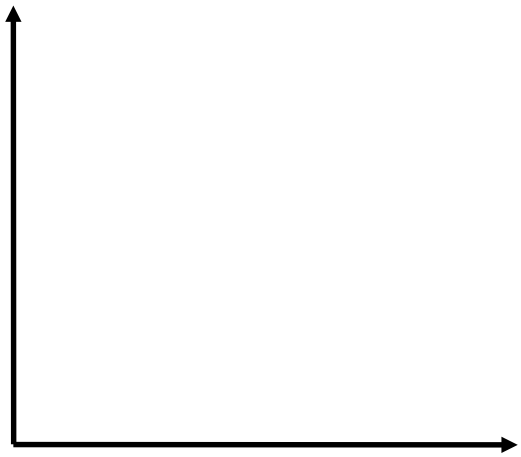
IIa. Please draw four separate diagrams and label initial equilibrium points A (see model on page one): Graph A: $S^d = I^d$ ; Graph B: FE/IS/LM; Graph C: $M^s/P = M^d/P$; Graph D: AD/SRAS/LRAS. Be sure to label all curves and the axes. (These graphs are theoretical and do not have to be drawn to scale.)

In the space below, please write down your original IS and LM curves (based upon the original, long-run equilibrium—at point A, in Graph B below).

IS: _____

LM: _____

Graph A



Graph B

Graph C

Graph D

IIa. Suppose there is a shock to $I^d$ and $I^d = 625 - 500r$.

What are two possible reasons for this shock to desired investment? Explain carefully and intuitively.

IIb. Derive an expression for the new short-run IS curve (r in terms of Y). Please show all work.

IIc. Solve for the short-run equilibrium (Keynesian fixed price level) output and real interest rate that clear the goods market. Please show all work. Please label the short-run equilibrium points B in your four graphs.

r: _____

Y: _____

IId. Solve for the new, long-run equilibrium real interest rate. Please show all work.

r: _____

IIe. Solve for the new long-run equilibrium price level. Please show all work. Please label long-run equilibrium points C in all four graphs.

P: _____

IIf. Find the new expression for the LM curve (r in terms of Y). Please show all work.

IIg. Explain how the economy moves from points A to B to C in the money market. Please refer to Graphs C and D and be sure to include how the adjustment of the price level and output in the short run impacts the money market.