Please sign the following oath:

The answers on this test are entirely my own work. I neither gave nor received any aid while taking this test. I will not discuss the questions on this test until after 5:00 p.m. on April 3, 2008.

Signature

Any test turned in without a signature indicating that you have taken this oath will be assigned a grade of zero.

Graph Instructions

When drawing diagrams, the following rules apply:

1. **Completely**, **clearly** and **accurately** label all axes, lines, curves, and equilibrium points.

2. The original diagram and any equilibrium points **MUST** be drawn in black or pencil.

3. The first change in any variable, curve, or line and any new equilibrium points **MUST** be drawn in red.

4. The second change in any variable, curve, or line and any new equilibrium points **MUST** be drawn in blue.

5. The third change in any variable, curve, or line and any new equilibrium points **MUST** be drawn in green.

**Do NOT** open this test until instructed to do so.

Good Luck!
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A. **Multiple Choice Questions.** Circle the letter corresponding to the best answer. (3 points each; total of 30 points.)

1. An increase in the real interest rate would cause an increase in the real demand for money:
   
   a. No matter what the change in expected inflation.
   b. If expected inflation fell by less than the rise in the real interest rate.
   c. If expected inflation fell by the same amount as the rise in the real interest rate.
   d. If expected inflation fell by more than the rise in the real interest rate.

2. Suppose that a new law imposes a tax on all trades of bonds and stocks. What is the likely effect on money demand?
   
   a. Money demand declines first, and then rises when inflation increases.
   b. Money demand rises. **(Correct Answer)**
   c. The overall effect is ambiguous.
   d. Money demand declines.

3. The IS curve would unambiguously shift to the right if there were:
   
   a. An increase in both government purchases and corporate taxes.
   b. An increase in both government purchases and the expected future marginal product of capital. **(Correct Answer)**
   c. An increase in the expected future marginal product of capital and a decrease in expected future output.
   d. A decrease in both corporate taxes and the expected future marginal product of capital.

4. Suppose that the Federal Reserve reduces the real interest rate to below 2%. This drastic action leads to fear and panic among households and businesses about what information the central bank might have about the economy. We could analyze this by:
   
   a. A rightward shift of the LM curve.
   b. A leftward shift of the LM curve.
   c. A rightward shift of the LM curve and a leftward shift in the IS curve. **(Correct Answer)**
   d. A rightward shift of the IS curve and a leftward shift of the LM curve.

5. An adjustable rate loan is a loan where the interest rate the borrower pays adjusts when the central bank changes interest rates. Compared to the U.S., Britain has a much more substantial proportion of adjustable rate loans. As a result, one would expect:
   
   a. A steeper IS curve in Britain than in the U.S.
   b. A flatter IS curve in Britain than in the U.S. **(Correct Answer)**
   c. A steeper LM curve in Britain than in the U.S.
   d. A flatter LM curve in Britain than in the U.S.
6. In general equilibrium, a decrease in money supply causes the real interest rate to ______ and the price level to ______:
   a. Rise; rise.
   b. Rise; fall.
   c. Fall; fall.
   d. **Remain unchanged; fall.**

7. If the expected rate of inflation rate rose at the same time the natural rate of unemployment increased, the Phillips curve:
   a. Would shift to the left.
   b. **Would shift to the right.**
   c. Would not shift.
   d. Might shift left, right, or not shift depending on which effect was larger.

8. The cost of disinflation would be low if:
   a. Expected inflation falls as inflation falls.
   b. Wage and price controls were used.
   c. **The Phillips curve was nearly vertical.**
   d. The Phillips curve adjusted slowly to changes in inflation.

9. In the DAD-SAS model, an rightward shift of the DAD curve leads to permanently higher inflation because:
   a. Of supply shocks.
   b. Of positive output gaps.
   c. Of negative output gaps.
   d. **Inflationary expectations have permanently changed.**

10. Standard economic theory says that a recession will have no effect on productivity. An alternative theory suggests that a recession can increase productivity permanently because it forces inefficient firms out of business. If this alternative theory is correct, then an unfavorable DAD shock will cause:
    a. **Inflation to fall more quickly and end up lower than under the standard theory.**
    b. Inflation to fall more slowly and end up higher than under the standard theory.
    c. Inflation to fall more slowly and end up lower than under the standard theory.
    d. Inflation to fall more quickly and end up higher than under the standard theory.
1. **IS – LM Model.** Suppose the economy was initially in general equilibrium, that Ricardian equivalence does not hold, that any adjustment to long-term equilibrium takes 4 years, and that any long-term supply shock effect on full-employment output is greater than any short-term inflation shock effect on output.

The following year a substantial fall in home prices resulted in a significant decline in household wealth. This also caused a substantial increase in the riskiness of the stock market. In response, the government temporarily reduced income taxes for many households while the central bank increased the money supply.

Assume that any fiscal policy effect on output is the same size as any monetary policy effect on output. Further assume that any non-policy effects on output are individually twice as large as any policy effect on output.

a. Based only on this information, use an IS – LM diagram to accurately and clearly show:
   i. The economy’s initial general equilibrium position (in black),
   ii. The separate effect that each of these changes has on the economy’s IS and LM curves, (sequentially in red, blue, and green), and
   iii. The economy’s short-term equilibrium position after these events occur.
b. Provide a brief economic explanation of the changes you shown in your diagram above. Be sure to compare the level of output and the real interest rate between the initial general equilibrium and the new short-term equilibrium that exists after these events occur.

The economy begins in general equilibrium with output at $Y_0$ and the real interest rate at $r_0$.

The following year a substantial fall in home prices that resulted in a significant decline in household wealth would increase desired saving (or reduce desired consumption) and shift the IS curve to the left from $IS_0$ to $IS_1$.

The substantial fall in home prices and significant decline in household wealth also led to a substantial increase in the riskiness of the stock market. This would increase the demand for money and shift the LM curve to the left from $LM_0$ to $LM_2$.

In response, the government temporarily reduced income taxes which would reduce desired saving (or increase desired consumption) and shift the IS curve to the right from $IS_1$ to $IS_3$. Because the fiscal policy effect on output is only one-half as large as the non-policy effect on output, this rightward shift of the IS curve is only one-half of the initial leftward shift of the IS curve.

In addition, the central bank increased the money supply, which would shift the LM curve to the right from $LM_1$ to $LM_4$. Because the money policy effect on output is only one-half as large as the non-policy effect on output, this rightward shift of the LM curve is only one-half of the initial leftward shift of the LM curve.

As a result of all of these changes, a new short-term equilibrium is established with output at $Y_3$, which is less than the economy’s full-employment level of output, i.e., $Y_3 < Y_0$, and the real interest rate at $r_3$, which is the same as its initial general equilibrium level, i.e., $r_3 = r_0$.

c. How would your answers above be different if complete Ricardian equivalence did hold? Be sure to provide a brief economic explanation.

If Ricardian equivalence does hold, then the temporary decline in income taxes would not cause the IS curve to shift to the right because households would perfectly foresee an increase in future income taxes. This would cause output to fall even further and for interest rates to be lower at the intersection of $IS_1$ and $LM_3$. 
2. **DAD – SAS Model.** Suppose the U.S. economy was initially in general equilibrium, that Ricardian equivalence does not hold, that any adjustment to long-term equilibrium takes 4 years, that any demand shocks have a larger effect on output than any inflation (or short-term supply) shocks, and that any long-term supply shock effect on full-employment output is smaller than any short-term inflation shock effect on output.

The following year the degree of globalization suddenly increased. As a result, U.S. multinational firms stopped investing in production facilities domestically and started investing in production facilities in China and India. These firms then imported goods and services from China and India to sell to their U.S. customers. Because of much lower production costs abroad, imported goods prices in the U.S. fell substantially. The increase in international competitive pressures also led to an increase in U.S. productivity because U.S. companies needed to compete in the new globalized world.

a. Based only on this information, use a DAD-SAS diagram to accurately and clearly show:

i. The U.S. economy’s initial general equilibrium (in black),

ii. The short-run effect on U.S. output and inflation from each of these changes (in red),

iii. The effects on U.S. output and inflation during the first 2 years of the adjustment process (in blue and green), and

iv. The U.S. economy’s final general equilibrium situation (in black).
b. Provide a brief economic explanation of the changes you showed in your diagram above as well as the adjustment process that the economy undergoes with respect to output and inflation. Be sure to compare the level of output, inflation, and the natural rate of unemployment between the initial and final general equilibrium situations.

The economy was initially in general equilibrium with output at $Y_0 = Y^*_0$, which is the economy’s full-employment level of output, and with a steady inflation rate at $\pi_0$.

In Year 1, four events happened.

First, increased globalization caused desired investment to decline as firms stopped investing in productive facilities domestically. This decline in investment caused the DAD curve to shift to the left from $DAD_0$ to $DAD_1a$.

Second, increased globalization caused domestic firms to import more goods and services from China and India. This increase in imports caused the DAD curve to shift to the left from $DAD_{1a}$ to $DAD_1$.

Third, increased globalization led to substantially lower imported goods prices. This was a favorable short-term inflation shock and caused the SRAS curve to shift down from $SRAS_0$ to $SRAS_{1a}$.

Fourth, increased globalization led to an increase in U.S. productivity, which is a favorable long-term supply shock and caused both the SRAS curve to shift down from $SRAS_{1a}$ to $SRAS_1$ and the LRAS curve to shift to the right from $Y^*_0$ to $Y^*_1$.

As a result of leftward shifts in the DAD curve, the downward shifts in the SRAS curve, and the rightward shift in the LRAS curve in Year 1, output declined from $Y_0$ to $Y_1$, which is less than the economy’s new higher full-employment output level at $Y^*_1$, while inflation fell from $\pi_0$ to $\pi_1$.

In Year 2, because $Y_1 < Y^*_1$, inflation fell from $\pi_1$ to $\pi_2$, the SRAS curve shifted down from $SRAS_1$ to $SRAS_2$, the purchasing power of the nominal money supply increased, the LM curve shifted to the right, the real interest rate declined, interest-sensitive spending increased, and output rose from $Y_1$ to $Y_2$. However, because there is a multiyear adjustment process, output was still less than its (new, higher) full-employment level so $Y_2 < Y^*_1$.

In Year 3 and beyond, this adjustment process continued. As long as output was less than the economy’s full-employment level of output, inflation falls, the SRAS curve shifts down, the purchasing power of the nominal money supply increases, the LM curve shifts to the right, the real interest rate declines, interest-sensitive spending increases, and output increases until general equilibrium is re-established.

General equilibrium will be re-established when output has risen to $Y_5 = Y^*_1$, the economy’s new, higher full-employment level of output. This level of output is above the economy’s initial general equilibrium level of output, i.e., $Y_5 > Y^*_0$. Inflation is permanently lower at $\pi_5 < \pi_0$. Because the economy’s full-employment level of output has increased, i.e., $Y^*_0 > Y^*_1$, the economy’s natural rate of unemployment has also declined, i.e., $U^*_1 < U^*_0$. 