1. **IS/MP/IA in the Open Economy**

Consider the IS/MP/IA model discussed in class. For each of the following, illustrate two diagrams: IS/MP and AD/IA to show the effects of each shock on key macro variables. In the diagrams, label the initial equilibrium Point A, the new short-run equilibrium Point B. State how the following variables change in the short run (between Point A and B): Y, r, π, C, I, CF, $ value.

a) The Federal Reserve lowers interest rates for any given level of Y and π.
b) Compare the outcome of a) to the case with a closed economy. How would your answers differ? Explain why.
c) The government increases taxes.
d) Compare the outcome of c) to the case with a closed economy. How would your answers differ? Explain why.

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2. **Phillips Curve**

This question considers the implications of the Lucas imperfect information model for the Phillips curve and the effectiveness of monetary policy. The inflation rate is currently 7% and the unemployment rate is currently 5%. The expectations-augmented Phillips Curve is: $\pi_t = \pi^e_t + b(u_t - u^n)$ and the economy is currently at its long-run equilibrium.

a) Draw a graph showing the long run rational expectations equilibrium in the expectations-augmented Phillips curve. Carefully label your graph, including the natural rate of unemployment and the expected inflation rate along the short-run Phillips curve.
b) Now, illustrate the economy's long-run equilibrium on the IS/MP/IA diagram.
c) Now suppose that the government appoints a new, independent central bank president who is strongly against inflation. This central banker announces a move toward reducing the inflation rate to 3% and carries out the monetary policy associated with this change. For this part, assume that the monetary policy change is unexpected. Label the equilibrium point B on your diagrams (you don't need to show the endogenous shifts in the MP curve).
d) Label the economy's long-run equilibrium at point C on both diagrams and describe how and why the economy transitions to its long-run equilibrium.
e) Now, suppose that people expected the change in monetary policy and revise their inflation forecasts today (even before the inflation rate fully adjusts). What does this imply about the speed of adjustment to the economy's long-run equilibrium point C?

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3. **Theories of Business Cycles**

In macroeconomics research, there are significant differences in explaining what causes business cycles (e.g., recessions and booms). Refer to the reading, Snowden & Vane (1997) to answer the following:

a) New Classical economists challenged the traditional Keynesian theory of business cycle. Name two objections New Classical economists had.
b) State two contributions New Classical economics has made to our understanding of how business cycles work.
c) Based on Snowden and Vane (1997), state the primary causes of business cycles according to each of the following schools of thought. You need only to state one or two variables that are the primary sources of changes in output (in the short run).
   (i) Traditional Keynesian
   (ii) Monetarist
   (iii) Real Business Cycle
   (iv) New Keynesian

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4. **Comprehensive Macroeconomic Model**

Consider the IS/MP/IA model and the Phillips Curve discussed in class. For each of the following, illustrate three diagrams: IS/MP, AD/IA, and the Phillips curve to show the effects of each shock on key macro variables. In the diagrams, label the initial equilibrium Point A, the new short-run equilibrium Point B, and the long-run equilibrium Point C. State how the following variables change in the short run (between Point A and B) and in the long run (between Point A and C): Y, r, π, C, I, CF, $ value. In these examples, you may assume adaptive expectations.

a) The Federal Reserve decreases the money supply.
b) Consumer confidence decreases.
c) The government decreases taxes.
d) Oil prices increase.
e) Describe how your answers above would differ if people had rational expectations. How would this affect the speed of adjustment from short run to long run? Explain.

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5. **Sources of Business Cycles**

Consider data on the following recessions. Based on the data, identify one potential source of the recession (in terms of the exogenous shocks from the IS/MP/IA model). Use IS/MP/IA analysis to support your answer. During all of these recessions, output declines.

a) 2001: Interest rates decrease and inflation declines.
b) 1981-82: Interest rates increase and inflation decreases.
c) 1974-75: Interest rates rise and inflation increases.
