The following formulas may be useful. The challenge is closed book. Good luck.

Money Supply

$$M = Hk\left(R\right) \quad , \qquad \Delta M = \Delta Hk\left(R\right), \quad k\left(R\right) = \frac{cr + 1}{cr + rrr + e\left(R - R_0\right)}$$

$$MS = m = \frac{M}{P} \quad , \qquad h = \frac{H}{P}, \quad m = hk\left(R\right)$$

Money Demand

$$MD = \sqrt{\frac{\delta Y}{2R}}, \quad MD = \frac{M}{P} = m = a - b\pi_{t+1}^e$$

Inflation Taxes: short run

$$\text{seniorage} = \frac{H_{t+1} - H_t}{P_t} = h_{t+1}\left(1 + \pi_t\right) - h_t$$

$$\text{taxes paid} = \frac{M_{t+1}}{P_t} - \frac{M_{t+1}}{P_{t+1}} = m_{t+1}\pi_t = k\left(R_t\right)h_{t+1}\pi_t$$

Inflation Taxes: Long run

$$\text{Long run seniorage} = \pi h, \quad \text{long run taxes paid} = k\left(R\right)\pi h$$

$$G - T = \text{deficit} = \text{borrowing} + \pi h$$

Phillips Curve and Monetary Misperceptions

$$u = NR - k\Delta Y = NR - k\left(Y - Y^*\right), \quad u = NR - k \cdot a\left(\pi_t - \pi_t^e\right)$$

$$Y = Y^* + a\left(P - P^e\right)$$

Short answer questions (1-2 sentences)

Question 1 (10 points)

Suppose inflation is unexpectedly low. Carefully explain how unemployment is affected, according to the monetary misperceptions model.

Question 2 (12 points)

For each of the 3 criteria given in class, explain briefly whether or not the inflation tax is a good tax according to that criteria. Suppose the economy sees very little inflation after raising seniorage revenues. Using just this information, is the inflation tax a good tax or a bad tax. Explain briefly.

Question 3 (8 points)

Suppose the price level is $20, the money supply is $100, and the money multiplier is 2. Suppose the FED now buys enough Tbills to increase the money supply to $180. The price level subsequently rises to 30.

  a. Calculate the real seniorage revenues.

  b. Calculate the real taxes paid.

Longer Questions

Question 4 (28 points)

While the U.S. prefers to conduct monetary policy by adjusting the high powered money stock, China's central bank prefers to adjust the required reserve ratio. In fact, China recently raised it's required reserve ratio to around 20%. The goal was to reduce demand in China's hot housing market.

  a. Graph the market for money, the IS-LM graph, and the AD-AS graph, with the Keynesian aggregate supply. Be sure to label the original equilibrium. Show on the graphs the effect of an increase in the required reserve ratio.

  b. Explain what happens to interest rates, equilibrium real money supply/demand, the number of withdraws, excess reserves, lending, deposits, investment spending, output, real wages, hours worked, and prices.

  c. Does the model predict that raising the required reserve ratio will acheive the central banks goal of reducing housing demand?

  d. Would an increase in the required reserve ratio currently have a large or small effect on inflation in the US? Explain briefly.

Question 5 (18 points)

Suppose confidence in interest bearing accounts increases due to the recent run up in stock prices.

    a. Would the slope of money supply or money demand be affected? Would the slope become steeper or flatter?

    b. Does the increase in confidence make monetary policy effective or ineffective? Show graphically in the money market graph and the IS-LM graph.

    c. Label the trapped liquidity. Is the trapped liquidity a big or small problem here?

Question 6 (24 points)

Suppose initial inflation and expectations are 2%. The natural rate is 5% and $k \cdot a = 3$. Consider now the FED's recent purchase of Tbills, QE2. Mmany observers thought such a massive increase in high powered money would be inflationary, and increased their expectations to 3% following QE2. However, most of the high powered money was not spent, but instead ended up in excess reserves, so inflation remained at 2% after QE2.

    a. Calculate the unemployment rate for each of 3 periods: the initial period, a first period corresponding to the short run after QE2 was implemented, and a second period corresponding to the long run.

    b. Show graphically all 3 periods on the Phillips curve graph.

    c. Did the FED acheive the goal of decreasing unemployment? Explain.

    d. What would happen to unemployment following QE2 in the Keynesian model with a flat money supply (liquidity trap): large increase, small increase, unchanged, small decrease, or large decrease? (Just state the answer, no need to graph or explain).