Instructions: The following are extra questions for practice and review. The topic covered is money.

1. Write down the three function which define money. Which of these functions do you feel is the most important?

2. List several different things which have served as money in the past. What is fiat money? What are some advantages and disadvantages of fiat money?

3. What does it mean for money to be “neutral”? Briefly provide some intuition for monetary neutrality.

4. What is meant by the “Classical Dichotomy”? Does it hold in the neoclassical model? What does it mean for the importance of modeling money when thinking about the evolution of real variables in response to exogenous shocks?

5. Suppose that a household lives for two periods, earning an exogenous stream of real income, $Y_t$ and $Y_{t+1}$. It potentially has to pay a tax (or, if the tax is negative, receive a transfer) in period $t$ only, $T_t$. It can consume goods, save in bonds, or hold money. The money price of goods is $P_t$, which the household takes as given. The nominal return on saving in bonds is $i_t$, which the household also takes as given. Household preferences are:

$$U = \ln C_t + \ln \left( \frac{M_t}{P_t} \right) + \beta \ln C_{t+1}$$

In nominal terms the first period budget constraint is:

$$P_tC_t + P_tS_t + M_t = P_tY_t - P_tT_t$$

In nominal terms the second period budget constraint is:

$$P_{t+1}C_{t+1} = P_{t+1}Y_{t+1} + (1 + i_t)P_tS_t + M_t$$

(a) Write each period budget constraint in real terms by dividing through by the price level, and then combine the budget constraints by eliminating $S_t$.

(b) What is the Fisher relationship? Provide some intuition for it.

(c) Using your combined intertemporal budget constraint from (a), find the first order conditions characterizing an optimal solution to the household problem.
(d) Use these first order conditions to derive a demand curve for money.

(e) In words, explain how the demand for money varies with $i_t$ and with $C_t$.

There is a government that prints money, levies taxes, and does spending. It only operates in period $T$ (e.g. the government does nothing in period $t + 1$). Its period $t$ budget constraint in nominal terms is:

$$P_t G_t = P_t T_t + M_t$$

(f) Suppose that the government does no expenditure, $G_t = 0$. Given $M_t$, what must be true about taxes, $T_t$?

(g) Since the government’s budget is balanced by construction (since it does not operate in the second period), what must be true about household saving, $S_t$? Given this, and combining the government budget constraint with the household period $t$ flow budget constraint, what must be true about $Y_t$ and $C_t$?

6. Consider our standard neoclassical model of the economy augmented to include money as developed in class. Graphically work through the effects of an exogenous increase in the money supply, $M_t$, on the endogenous variables of the model (the endogenous variables are $Y_t$, $C_t$, $I_t$, $N_t$, $w_t$, $r_t$, $i_t$, and $P_t$).

7. Consider our standard neoclassical model of the economy augmented to include money as developed in class. Graphically work through the effects of an exogenous increase in expected inflation, $\pi_{t+1}^e$, on the endogenous variables of the model (the endogenous variables are $Y_t$, $C_t$, $I_t$, $N_t$, $w_t$, $r_t$, $i_t$, and $P_t$).

8. Consider our standard neoclassical model of the economy augmented to include money as developed in class. Graphically work through the effects of an exogenous increase (separately) in $A_t$, $A_{t+1}$, $H_t$, $G_t$, $G_{t+1}$, and $q$ and show how the endogenous variables of the model are affected (the endogenous variables are $Y_t$, $C_t$, $I_t$, $N_t$, $w_t$, $r_t$, $i_t$, and $P_t$).

9. Suppose that a central bank desires to keep the price level constant. How would it need to adjust the money supply in response to exogenous changes in $A_t$, $A_{t+1}$, $H_t$, $G_t$, $G_{t+1}$, and $q$ in order to do so?

10. What does our model imply about the correlation between the nominal interest rate and inflation in the long run? Does this seem to roughly hold in the data?