Question 1: (45 points)

Consider a closed economy where goods are produced according to $Y_t = AK_t^\alpha (E_t L_t)^{1-\alpha}$, where $Y_t$ is output, $K_t$ is the capital stock, $E_t$ is labor efficiency and $L_t$ is labor input. Households save a constant fraction $s$ of current income $Y$, capital depreciates at a rate $\delta$, the population grows at a constant rate $n$ and labor efficiency $E_t$ grows at a constant rate $g$. We know the capital’s share of income $\alpha$ is 0.5, $A = 1$, $\delta = 0.05$, $n = 0.01$, $g = 0.04$.

a) What are the growth rates of total output $Y_t$, output per capita $\frac{Y_t}{L_t}$, total capital $K_t$ and capital per capita $\frac{K_t}{L_t}$ in the steady state?

b) What is Golden Rule level of the capital per-effective worker in steady state?

c) Suppose $s = 0.4$. What is the value of capital per-effective worker in steady state?

d) Suppose that the government decides to change the saving rate to achieve the golden level of per-effective worker capital. Calculate the new saving rate that achieves that goal.

e) Graph the path of consumption per effective worker as capital per effective worker moves from the steady state at the old saving rate to the golden rule steady state.

f) Are the following statements correct? Why (not)?

(1) In Solow model, sustained growth in living standards is due to capital accumulation.
(2) In Solow model, a higher saving rate (other parameters do not change) means higher steady state per-effective worker capital.

(3) In Solow model, a higher saving rate (other parameters do not change) means higher economic growth rate in steady state.

**Question 2: (30 points)**

Assume that an economy is described by the IS curve $Y = 3600 + 3G - 2T - 150r$ and the LM curve $Y = 2M/P + 100r$. The investment function for this economy is $I = 1000 - 50r$. The price level is fixed at $P = 1$.

a. The consumption function takes the form $C = C^a + MPC(Y - T)$. What are the values of $C^a$ and $MPC$?

b. Assume that government spending is fixed at 1200. The government wants to achieve a level of investment equal to 900 and also achieve $Y = 4000$. What levels of $T$ and $M$ must be set to achieve the two goals? What will be the value of the interest rate $r$? What will be the levels of private saving, public saving, and national saving?

c. Now assume that the government wants to have $T = 1000$. With $G$ set at 1200, what will the interest rate be at $Y = 4000$? What must be the value of $M$? What will $I$ be? What will be the levels of private, public, and national saving?

**Question 3: (45 points)**

What is the cyclical behavior of inflation? What do the following business cycle theories predict about the cyclical behavior of inflation, and is it consistent with the data? What is the role of expectations about future inflation in each of the theories?

a. The Real Business Cycle Theory

b. Misperceptions Theory.


**Question 4: (30 points)**

Over the long run, bilateral nominal exchange rates are closely linked to inflation differentials between countries (see figure.)
a. How can you explain this relationship?

b. Historically, many open economies have opted for a regime of fixed nominal exchange rates. In light of the data in the figure, carefully explain why they may have done so.

**Question 5: (50 points)**

Explain briefly:

3.1 Absorption (5 points)

3.2 Labor Hoarding (5 points)

3.3 Money-output correlation and reverse causation (5 points)

3.4 The Impossible Trinity (5 points)

3.5 Natural Rate of Unemployment (5 points)

3.6 Policy Ineffectiveness Proposition (5 points)

3.7 Liquidity Trap (5 points)

3.8 Consumption Smoothing (5 points)

3.9 Income Elasticity of Money Demand (5 points)

3.10 Benefits of Moderate Inflation (5 points)