Question 1: Economics (30 points)

Mr. Jog, an economist in Country Agiland, decided to theoretically analyse how the monetary policy of his own country and those of other foreign countries affect foreign exchange rates and the economy of Agiland.
Agiland is a small open economy that can be described by the Mundell-Fleming model as follows:

(IS)

$$Y = C\left(Y - \bar{T}\right) + I\left(i, Y\right) + \bar{G} + NX\left(Y, Y_F, S\right)$$

(LM)

$$\frac{\overline{MS}}{P} = L\left(Y, i\right)$$

(UIP)

$$S = \frac{E\left(S\right)}{1 + i - i_F}$$

- List of endogenous variables

Y : Output, i: Interest rate in Agiland, S : Exchange rate
[Note: An increase in S means a deprecation of the currency of Agiland.]

- List of exogenous variables

$\bar{G}$: Government expenditure, $\bar{T}$: Taxes, Y_F : Output of foreign countries,
$\overline{MS}$: Money supply, P : Price level, $E(S)$: Expected exchange rate,
i_F : Interest rate of foreign countries

- Characteristics of functions

Consumption C is an increasing function of $Y - \bar{T}$.
Investment I is a decreasing function of i, and an increasing function of Y.
Net exports NX is an increasing function of Y_F and S, and a decreasing function of Y.
Real money demand L is an increasing function of Y, and a decreasing function of i.

a) Explain the positive and negative effects that a depreciation of the domestic currency (an increase in S) can have on net exports NX. Also, for NX to be an increasing function of S as described above, some condition must hold; give the name of that condition. (5 points)

b) Explain the relationship between the expected rates of return on foreign and domestic bonds based on the uncovered interest rate parity (UIP). Rearrange the UIP formula to fit your explanation. (4 points)

c) When the domestic interest rate i is constant, a rise in interest rates in foreign countries results in a depreciation of the domestic currency (i.e. a rise in S). Explain this relation based on the UIP formula. (2 points)

d) When the domestic interest rate i is constant, what impact will the depreciation of the domestic currency (i.e. the rise in S) have on output Y? Explain based on the IS relation above. (2 points)

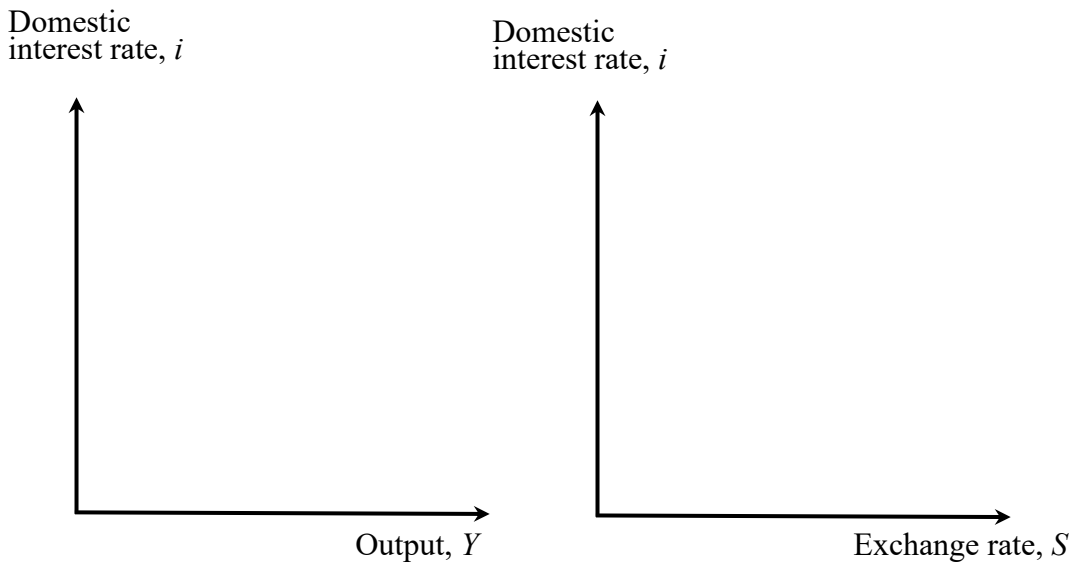
e) When output Y changes as in your answer to question d), this brings about a change in the real money demand. Assuming the central bank wants to keep the domestic interest rate i constant, what sort of monetary policy should it adopt for that purpose? Explain based on the LM relation above. (2 points)

f) Next, Mr. Jog decides to analyse the effects of a rise in the foreign interest rate i_F using diagrams.

f1) Draw the IS curve and the LM curve in the (i,Y) plane on the left and the UIP curve in the (i,S) plane on the right in Auxiliary graph (i). (6 points)

Auxiliary graph (i)

IS-LM Diagram

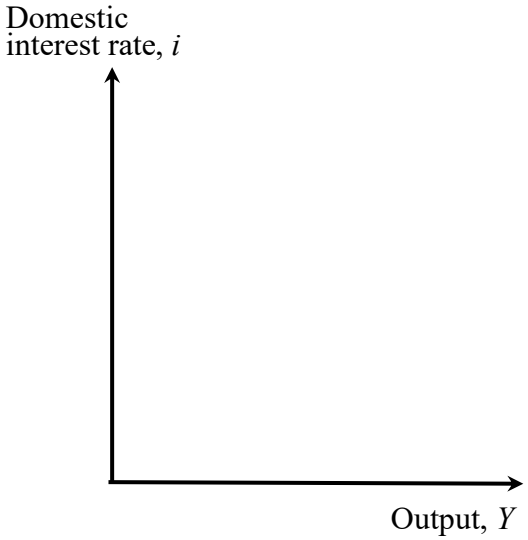


f2) Explain how the IS curve shifts due to the rise in the foreign interest rate and draw the new IS curve on the IS-LM diagram in Auxiliary graph (ii). (4 points)

f3) Assume that the central bank of the domestic country adjusts money supply to keep the domestic interest rate *i* constant. Explain how the LM curve shifts and draw the new LM curve on the IS-LM diagram in Auxiliary graph (ii). (4 points)

Auxiliary graph (ii)

IS-LM Diagram



f4)Based on the diagrams you have completed under questions from f1) to f3), explain the effects on the domestic output *Y*. (1 point)