PART I. SHORT QUESTIONS (5 points each)

1. T/F/U (justify your answer). The bilateral exchange rate between US and Japan is 124 (1$ can buy 124 ¥). Therefore, American tourists in Japan find everything very cheap.
   UNCERTAIN. We cannot infer how cheap the relative price of Japanese goods is by looking at the nominal exchange rate. To know whether goods in Japan are relatively cheaper or more expensive than American goods, we need to consider the real exchange rate. That is, not only the nominal exchange rate but also the prices of the goods in both countries.

2. T/F/U (justify your answer). Devaluation is always associated with gains in competitiveness.
   FALSE. If domestic prices increase in the same proportion as the increase in the nominal exchange rate, devaluation has no impact on the real exchange rate. In that case, there is no gain in competitiveness.

3. Complete the blanks:
   
<table>
<thead>
<tr>
<th>Current Account</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Export</td>
<td>1000</td>
</tr>
<tr>
<td>Imports</td>
<td>1500</td>
</tr>
<tr>
<td>trade balance</td>
<td>-500</td>
</tr>
<tr>
<td>Investment income received</td>
<td>300</td>
</tr>
<tr>
<td>Investment income paid</td>
<td>400</td>
</tr>
<tr>
<td>net investment income</td>
<td>-100</td>
</tr>
<tr>
<td>Net transfers received</td>
<td>50</td>
</tr>
<tr>
<td>Current Account balance</td>
<td>-550</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Capital Account</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>increase in foreign holdings of US assets</td>
<td>500</td>
</tr>
<tr>
<td>Increase in US holdings of foreign assets</td>
<td>-50</td>
</tr>
<tr>
<td>Net Capital Inflows</td>
<td>550</td>
</tr>
</tbody>
</table>

PART III. OPEN ECONOMY WITHOUT CAPITAL MOBILITY (15 points each)

Imagine a small open economy in a world of no capital mobility. The economy is characterized by the following behavioral equations:

\[ C = c_0 + c_1 (Y-T) \]
\[ I = b_0 + b_1 Y - b_2 i \]
\[ G = G_0 \]
\[ T = T_0 \]
\[ X = x_0 + x_1 Y^* + x_2 \varepsilon \]
\[ IM = q_0 + q_1 Y - q_2 \varepsilon \]
\[ M^d = m_0 + m_1 Y - m_2 i \]
\[ M^s = M_0 \]

Where \( Y^* \) is the level of foreign output and \( \varepsilon \) is the real exchange rate.

1. **What is the total demand for domestic goods? What is the trade balance?**

Plot the IS and the LM curves in the \((Y,i)\) space and the trade balance in the \((XN, Y)\) space, assuming that at the equilibrium point the trade balance is zero and the output is at its natural level.

The total demand for domestic products is given by:

\[ Z = C + I + G + X - \varepsilon IM \]
\[ = A(\varepsilon, Y^*) + \beta Y - b_2 i \]

where

\[ A(\varepsilon, Y^*) = c_0 + b_0 + G_0 + x_0 - c_1 T_0 + x_1 Y^* + (q_2 \varepsilon - q_0 + x_2) \varepsilon \]

\[ \beta = c_1 + b_1 - q_1 \]

The trade balance is:

\[ XN = X - \varepsilon IM \]
\[ = x_0 + x_1 Y^* + x_2 \varepsilon - (q_0 + q_1 Y - q_2 \varepsilon) \varepsilon \]
2. Now, assume that at the equilibrium point, the output is below its natural level and there is trade deficit. Explain under what conditions a real depreciation can improve the situation. Use a graph and provide intuition.

A real depreciation leads to competitiveness gains –i.e. foreign goods became more expensive relative to domestic goods-. Therefore, there is reduction in the amount of imported goods and an increase in exports. Nevertheless, although the amount of imported goods is smaller, their value in domestic price increases so the effect of a real depreciation on the trade balance and the aggregate demand is ambiguous.

\[
X_N = x_0 + x_1 Y^* + x_2 \varepsilon - (q_0 + q_1 Y - q_2 \varepsilon) \varepsilon
\]

A depreciation improves the trade balance if

\[
\frac{dX_N}{d\varepsilon} = x_2 - q_0 - q_1 Y + 2q_2 \varepsilon > 0
\]

If that is the case, a real depreciation leads to an increase in the autonomous aggregate demand (shift IS) and improves the trade balance given \(Y\) and \(Y^*\) (shift \(X_N\)). The resulting level of income is higher than before so imports partially recover although the trade balance is unambiguously better off.
3. **What policies would you recommend if at the natural output level the economy runs trade deficits?**

To improve the trade balance without affecting the level of output, a mix of policies may be applicable, for example, a real depreciation together with a decrease in public expenditure. The autonomous spending won’t be affected (there is no shift in the IS curve) since the contractionary fiscal policy offsets the positive effect of a real depreciation (assuming that the Marshal-Lerner condition holds). The level of output remains at its natural level but its composition changes –i.e. the drop in government expenditure is compensated by a decrease in the trade deficit-.

---

**PART IV. OPEN ECONOMY WITH PERFECT CAPITAL MOBILITY (10 points each)**

True/False/Uncertainty. Justify your answer intuitively and graphically using the IS/LM/BP model.
1. **In a small open economy under fixed exchange rate, monetary policy is extremely effective in altering the output level.**

FALSE. Under perfect capital mobility, the balance of payment is equilibrated only if domestic interest rate is equal to the international level. A monetary expansion tends to reduce the domestic interest rate below the international level. Consequently there are massive capital outflows (Balance of Payment deficit) causing downward pressures on the exchange rate. The Central Bank has to intervene in order to maintain the fixed exchange rate by buying domestic money (selling Central Banks reserves), so the amount of domestic money in the economy decreases till the domestic interest rate goes back to its previous level. The level of output is unchanged, the interest level is unchanged, and the amount of money in the economy is unchanged.

![Graph of IS-LM model with fixed exchange rate](image)

2. **In a small open economy under flexible exchange rate, monetary policy is extremely effective in altering the output level.**

TRUE. Under perfect capital mobility, the balance of payment is equilibrated only if domestic interest rate is equal to the international level. A monetary expansion tends to reduce the domestic interest rate below the international level. The consequently capital outflows provoke depreciation of the domestic currency (Balance of Payment deficit), leading to an increase in exports (shift the IS). The process continues till the domestic interest rate achieves the international level. The resulting output level is higher, due to the increase in net exports.

![Graph of IS-LM model with flexible exchange rate](image)
3. Flexible exchange rate is better than fixed exchange rate regimes in stabilizing domestic output against fluctuations in international output level.

TRUE. Variations in international output level affect domestic exports (shift IS). A reduction in exports, for example, leads to capital outflows (Balance of Payment deficit). Under flexible exchange rate, the deficit in the Balance of Payment induces a domestic depreciation, which increases exports offsetting the initial drop. The output level will remain unchanged. Under fixed exchange rate, the deficit in the Balance of Payment causes downward pressures on the exchange rate and the Central Bank has to buy domestic currency (selling Central Bank reserves) in order to maintain the fixed exchange rate. The output level is therefore lower.