1 Answer each as True, False, or Uncertain. Give a one or two sentence explanation for your answer.

A) In the 1990s, the GDP of the United States grew more quickly than the GDP of Japan. A primary reason for this was the lower unemployment rate in the United States during this period.

B) Consider two countries, country A and country B. The entire output of country A comes from producing widgets, a final good. The entire output of country B comes from selling gidgets, an intermediate good in the production of widgets, to country A. If the value of country A’s widgets is $100 and country A’s GDP is $60, then country B’s GDP must be $40.

C) The unemployment rate in Macronesia (a country) drops in one year from 8% to 7%, and the population of people of working age remains the same. Therefore, there has been an increase in the number of workers who are employed in Macronesia.

D) Macronesia enters an economic slump. There are two types of people in Macronesia, type 1 and type 2. Type 1 individuals save a greater share of any income increases than do type 2 individuals. To have the biggest effect on output, it would be best to target any tax cuts to the type 2 individuals.

E) Corporate profits represent a larger share of US GDP than does wages paid to workers.

F) Wanting to make its economy grow faster, the government of Macronesia decides to increase government spending. Macronesia also has a high inflation rate. This expansionary fiscal policy will also have the benefit of lowering Macronesia’s high inflation rate.

(G) Suppose that Macronesia is in a recession. To get out of the recession, it decides to decrease taxes this year and then increase them by the same amount next year (the government is very concerned about deficits). This policy (which is announced to the public) is guaranteed to help the recession by getting people to spend more today.

2 Macroeconomic statistics

A) Consider Macronesia, a country with three companies: Macrosoft, Company A, and Company B. Macrosoft makes Monopoly board games using boards and cards as its intermediate goods. Company A makes cardboard. Company B makes boards and cards using cardboard. Their respective balance sheets are below.

<table>
<thead>
<tr>
<th>Company A</th>
<th>Company B</th>
<th>Macrosoft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$10</td>
<td>Revenues</td>
</tr>
<tr>
<td>Expenses: Wages</td>
<td>$5</td>
<td>Expenses: Wages</td>
</tr>
<tr>
<td>Cardboard</td>
<td>$10</td>
<td>Boards and cards</td>
</tr>
<tr>
<td>Profit</td>
<td>$5</td>
<td>Profit</td>
</tr>
</tbody>
</table>
Show three different ways to compute the GDP of Macronesia.

B) Consider the basic macroeconomic aggregate statistics for Macronesia, where the base year is 1999 (GDP deflator=1).

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP</th>
<th>GDP deflator</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>$35</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>2000</td>
<td>$40</td>
<td>1.10</td>
<td>4%</td>
</tr>
<tr>
<td>2001</td>
<td>$50</td>
<td>1.30</td>
<td>5%</td>
</tr>
<tr>
<td>2002</td>
<td>$55</td>
<td>1.45</td>
<td>6%</td>
</tr>
<tr>
<td>2003</td>
<td>$60</td>
<td>1.45</td>
<td>4%</td>
</tr>
</tbody>
</table>

Real GDP:

1) Fill in the line for real GDP in the table.
2) When did the economy of Macronesia grow the fastest in real terms?
3) Does the data follow Okun’s law? Does it follow the Phillips curve?

C) Suppose that Macronesia’s GDP can be decomposed as follows.

- **GDP** $100
- Personal consumption $40
- Private investment $40
- Government purchases $20
- Net exports $0

Describe how this table would change if Social Security payments to senior citizens increased by $5 and private investment decreased by $5 with no other changes. Would GDP increase, decrease, or stay the same? Assume that any increase in Social Security payments goes to personal consumption and that any increase in transfers comes at the expense of other government purchases.

### Solving a Model of Consumption

The economy of Macronesia is in equilibrium. Two conditions determine equilibrium in the Macronesian goods market:

1. $Z = c_0 + c_1(Y - T) + I + G$, and
2. $Y = Z$,

where: $Z$ = total demand for goods, $T$ = taxes, $I$ = investment, $G$ = government spending, and $a$, $c_0$ and $c_1$ are constants with $0 < c_1 < a < 1$.

A) Assume that the government runs a balanced budget ($G = T$). Solve for the equilibrium level of output. What effect does an increase in government spending have on equilibrium output (given that taxes increase by the same amount)?

B) Now assume that taxes are a constant fraction of income. What is the equilibrium output level? Again assume budget balance is maintained. What happens as the tax rate approaches one? Does this seem realistic?

C) Now consider the following modification to the basic model in A). As taxes increase, more of each additional dollar is lost to government waste. So the demand equation becomes: $Z = c_0 + c_1(Y - T) + I + G - \frac{1}{2}T^2$, where $\frac{1}{2}T^2$ describes the amount of waste in Macronesia. What tax rate maximizes equilibrium output, given that $G = T$?

D) Depict equilibrium in the goods market for the economies described in A) and C), given equal, nonzero tax rates in each.