1. Clearly and accurately draw and label a diagram of the IS—LM—BB Model.
2. Provide an economic explanation of the shape of the budget balance curve in your diagram in #1.

   The Budget Balance (BB) line represents the positive relationship between economic output (and income) and tax revenues as well as the positive relationship between economic income and the budget balance. It indicates that as economic income rises, tax revenues also increase as does the budget balance. The slope of the budget balance line is the economy’s tax rate.

3. List the new endogenous and exogenous variables that are not already included in the IS—LM—FE model.

   New endogenous variables: tax revenues (which were previously exogenous), the absolute budget balance, and the structural budget balance.

   New exogenous variables: the tax rate.

4. List the variables (and the direction of their change) that would shift or rotate the BB curve higher. Also provide an economic explanation for why each of these variables would shift or rotate the budget balance function.

   A decrease in government purchases would shift the budget balance line higher. A decline in government purchases increases the budget balance at any given level of income.

   An increase in tax rates would rotate the budget balance line higher. An increase in tax rates increases tax revenues at any given level of income. However, the increase in tax revenues is larger, whenever income is larger. This causes a rotation of the budget balance line rather than a shift.

5. Assume that the economy starts in equilibrium. Suppose now that there is an increase in taxes (with no Ricardian equivalence). Describe the adjustment process that moves the economy from its initial equilibrium to its final equilibrium.

   An increase in tax rates would decrease disposable income. A decrease in disposable income would reduce desired consumption by the marginal propensity to consume multiplied by the change in disposable income. A decline in desired consumption would reduce economic output (or income) and shift the IS curve to the left.

   The decline in economic output (or income) would cause a decline in the real demand for money. At the initial real interest rate, the real demand for money is now less than the real supply of money. Consequently, the real interest rate will decline. As the real interest rate declines, desired consumption, desired investment, and the real demand for money will increase. This process continues until both the real interest rate and economic output have fallen to levels where the markets for both goods and money are back in equilibrium.

   An increase in tax rates also rotates the budget balance line higher. At the initial economic output level, tax revenues increase and the budget balance improves. However, the decline in economic output caused by higher tax rates would reduce tax revenues. This causes the budget balance to decline. Once economic output has reached its new short-term equilibrium level, the absolute budget balance is higher than it was initially but not high as it would have been had income not declined. The structural budget balance would increase by the change in tax revenues caused by higher tax rates measured at the full employment level of output.