A. On one side of a single sheet of paper:

1. Clearly and accurately draw and label a diagram of the Closed Economy Saving-Investment Model.

![Diagram of Closed Economy Saving-Investment Model]

2. Provide an economic explanation of the shape of the curve(s) in your diagram in #1.

   The desired saving function is the **positive relationship** between desired saving and the real interest rates.

   The desired saving function slopes upward because an increase in the real interest rate will increase desired saving because the reward to saving has increased (the substitution effect), the cost to borrowers has increased (a negative income effect), and the benefit to savers has increased (a positive income effect). Empirical evidence suggest that the first two effects are larger than the last effect, i.e., the net effect is positive but inelastic.

   The desired investment function is the **inverse relationship** between desired investment and the real interest rate.

   The desired investment function slopes downward because an increase in the real interest rate will raise the tax-adjusted user cost of capital, making it more expensive to acquire new capital, thereby reducing the desired capital stock, and reducing desired investment.
3. List the endogenous and exogenous variables in this model.

   **Endogenous:** desired saving, desired consumption, desired investment, real interest rate.

   **Exogenous:** wealth, expected future income, government purchases, taxes, expected future marginal product of capital, and the tax-adjusted user cost of capital when it comes from changes in the price of capital and/or the effective corporate tax rate. (The depreciation rate is also an exogenous variable but we typically ignore it in our analysis because changes in the depreciation rate are relatively small and infrequent.)

   [Current output is actually an endogenous variable although it is often treated as if it were an exogenous variable in this model. That is because the model often treats the economy as being a full-employment, which is a long-term concept. However, the relationships we have developed are also true in the short-term when current output is endogenous.]

4. List the variables (and the direction of their change) that would shift the saving function to the right. Also provide an economic explanation for why each of these variables would shift the saving function.

   A rise in current output would increase both desired consumption (by the marginal propensity to consume) and desired saving directly.

   A decrease in wealth or a decrease in expected future income would reduce desired consumption for any given current income. Consequently, desired savings would increase.

   A decrease in government spending would increase desired saving directly.

   A rise in current taxes would increase government saving directly. A rise in current taxes (without Ricardian equivalence) would also reduce private disposable income, causing desired consumption to decline by the marginal propensity to consume and private saving to decline by the marginal propensity to save. However, because the increase in government saving is much larger than the decline in private saving, desired national saving rises.

5. List the variables (and the direction of their change) that would shift the investment function to the right. Also provide an economic explanation for why each of these variables would shift the investment function.

   An increase in the expected future marginal product of capital increases the expected return to capital, thereby increasing the desired capital stock, and increasing desired investment.

   A decrease in the tax-adjusted user cost of capital from a decline in the effective corporate tax rate or a decline in the price of capital makes it less expensive to acquire new capital, thereby increasing the desired capital stock, and increasing desired investment.
6. Assume that the economy starts in equilibrium. Suppose now that the effective corporate tax rate increases. Describe the adjustment process that moves the economy from its initial equilibrium to its final equilibrium.

An increase in the effective corporate tax rate would increase the tax-adjusted user cost of capital. This would make capital more expensive, reduce desired investment, and shift the desired investment curve to the left.

At the initial equilibrium real interest rate, desired saving (or the supply of loanable funds) exceeds desired investment (or the demand for loanable funds). As a result, the real interest rate begins to decline. As the real interest rate declines, desired saving also declines along the desired saving function while desired investment increases along the new desired investment function. This adjustment continues until the real interest rates falls by enough so that desired saving exactly equals desired investment.