A. Write the maximization problems for the household and the firm. Make sure to include a budget constraint.

B. Show the first order conditions for the household and firm in this economy.
C. Show the first order conditions in the steady state.

D. Solve for the steady-state values of labor, consumption, output, investment, capital, the wage rate, and the rental rate of capital, given the following values for the model coefficients: $\beta = 0.95, \delta = 0.10, \theta = 1/3, \phi = 2, \text{and } A = 1$.

Suppose that the government places a 45 percent tax rate on labor income in this economy, and the tax revenue is rebated to the household. The household views this transfer as exogenous. The rest of the economy is the same as above. Note that this modified model is similar to the one discussed in the Prescott paper on the reading list, "Prosperity and Depression", 2002, American Economic Review.

E. Show the maximization problem of the household with this income tax and the tax rebate, and solve for the first order conditions of the household and firm.

F. Solve for the steady state values of labor, consumption, output, investment, capital, the wage rate, and the rental rate of capital in this economy. Present these values as percentages of their values in the economy without taxes. Describe how taxes change these values. Specifically, discuss how the incentives to work and the constraints that the households and/or firms face are impacted by taxes. (3 sentences maximum).