Task 1 – 40%

Part A

The inverse demand curve for good X is $P_X = 10 - Q_X$ with Q_X the quantity of good X demanded and P_X the price per unit of good X. The supply curve is perfectly elastic for a price equals to \$4. The good X is subject to a proportional tax of 20%.

The inverse demand curve for good Y is $P_Y = 20 - Q_Y$ with Q_Y the quantity of good Y demanded and P_Y the price per unit of good Y. The supply curve is perfectly elastic for a price equals to \$4. The good Y is not taxed.

1. How much is the tax revenue and how much is the welfare loss associated to the taxation of the good X?
2. How much will the tax revenue be if the tax on good X is reduced to 10% and at the same time a
3. What is the welfare loss of taxing both goods at 10%?
4. Compare the tax revenue and welfare loss of taxing only good X versus taxing both goods. Which of the tax system is to be preferred from an efficiency point of view?

Part B

Which rule can the government follow in order to design an optimal taxation of the two goods X and Y studied previously? Describe and explain in detail this rule.

In the design of optimal taxation, which considerations are not captured by this rule? Give a concrete example.

Write up to three pages for part B.

Task 2 – 20%

An individual lives two periods, 0 and 1. The income is 20,000 in period 0 and 15,000 in period 1. The individual's utility function is $U(c_0, c_1) = c_0^{0.8} c_1^{0.2}$, where c_0 is the consumption in period 0 and c_1 is the consumption in period 1. Suppose that the individual can save or borrow from the bank from period 0 to period 1 with a 20% interest rate.

1. How much will the individual consume in the two periods? How much will she save? Study the equilibrium both graphically and analytically.
2. A National Insurance scheme is established. The individual must pay 200 in period 0 and receives the same amount with interests in addition to her income in period 1. What will the consumption and savings be in the two periods if the National Insurance scheme uses the same interest rate as the bank?
3. Give and develop one justification for the implementation of a public social pension system rather than a private one.

Task 3 – 30%

Suppose that recipients of social assistance receive $800 in benefits per month, but that the benefit is reduced by 50 cents per dollars earned.

1. Set up a function that describes how the size of the benefit depends on income.
2. Suppose an individual earns $1000 per month. How much does the individual receive in benefits?
3. How much can an individual earn per month before losing the right to social assistance?
4. Use an economic model to discuss how social assistance affects equilibrium in the labor market (the individual's trade-off between leisure and work).

Task 4 – 10%

Consider an economy consisting of two individuals Jane and Lisa. The total income in the economy is $10,000 and is to be split between the two individuals.

The utility of Jane is given by $U_J = \sqrt{I_J}$ where I_J is the income allocated to Jane.

The utility of Lisa is given by $U_L = 2\sqrt{I_L}$ where I_L is the income allocated to Lisa.

1. Find the income distribution that maximizes social welfare in the case of an additive social welfare function.
2. Explain what are an additive social welfare function and a social welfare function based on the maximin criteria. Develop the differences and the consequences of this in terms of equity.