AS/ECON 4070 3.0AF Assignment 2 due : Wednesday November 16

Do **all 5** questions. All count equally

1. What should the optimal tax rate be on good Z, if good X cannot be taxed, and if the commodity taxes on goods Y and Z are optimal, if the tax rate on good Y is 10%, and if the economy's one consumer's preferences can be represented by the utility function

$$u(X, Y, Z) = X + 40 \ln Y + 100\sqrt{Z}$$

where (X, Y, Z) is her consumption of the 3 goods, if the net–of–tax price of each good is 1?

2. What is the relation between the optimal commodity tax rates on goods Y and Z if good X cannot be taxed, and if the commodity taxes on goods Y and Z are optimal, if the economy's one consumer's preferences can be represented by the utility function

$$u(X, Y, Z) = X + (YZ)^a$$

where $0 < a < \frac{1}{2}$, if the net–of–tax price of each good is 1? Explain briefly.

3. Suppose that a small imaginary country consists of two groups of people. "High–ability" people, comprising 20% of the country's work force, can earn an annual income of 80, whereas the other 80% can earn an annual income of 40.

The government must raise tax revenue averaging 16 per person, using a flat tax, in which each person's tax liabilities (whether she is high–ability or not) are

$$T \equiv \tau(Y - E)$$

where Y is her annual reported income, τ the marginal tax rate, E the exemption level, and T the person's tax liabilities.

People do not get to choose how many hours to work in this little economy. However, they can choose whether or not to work in the commercial sector, or the "cash only" sector. If they work in the "commercial" sector, they earn their regular income (80 or 40, depending on whether they are "high–ability" or not), and all income is reported to the tax authorities. If they work in the "cash only" sector, they make only half as much money (40 or 20, depending on whether or not they are "high–ability"). But none of their income from the "cash only" sector gets reported to the tax authorities.

So each person has to choose one sector or the other, and chooses whichever job gives her the highest net income.

In this economy, which choice of flat tax system (τ, E) would be best for the ("low–ability") majority?

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4. According to the Haig–Simons (or "comprehensive") definition of income, what would the annual taxable income be for the following person?

She earns $100,000 in salary. She uses public transit to travel to work, for which she buys a transit pass which costs $1000 per year. She also owns a snowmobile, which she uses for recreation in winter. The annual cost of fuel, insurance, and depreciation on the snowmobile is $1000. In the city, she takes taxis when going to movies, restaurants, and other entertainment : she spends $1000 per year on taxi fares.

At the beginning of July, her uncle died, and she inherited his vacation property, which is worth $100,000. The uncle had rented the property out to another couple (for the whole year), at a rent of $2000 per month. The couple are still renting. The maintenance expenditure and taxes on the vacation property are $1000 per month.

At the beginning of the year, she owned stock which was worth $150,000. During the year, the stock decreased in value by $10,000. She also bought some additional shares, for $20,000, in a new public offering, during the year.

She lives in an apartment, on which she spends $18,000 a year in rent.

5. According to the Haig–Simons (or "comprehensive") definition of income, what would the annual taxable income be for the following person?

He earned $80,000 in salary. Of that salary, $5,000 went into a company pension plan. In addition, his employer contributed $5,000 into his account in the company pension plan.

He owns his own house, which was worth $400,000 at the beginning of the year, and $450,000 at the end of the year. His annual property taxes on the house were $5000. He spent $10000 a year on maintenance, utilities and insurance on the house. He also has a $300,000 mortgage on the house, on which he paid $15,000 in interest. He estimates that the house would rent for $35,000 a year if it were rented to someone else.

Late in the year, he also sold a valuable painting he owned, for $210,000. He had bought the painting in 1990 for $120,000. At the beginning of the year, the value of the painting had been appraised at $225,000.