AS/ECON 4070 3.0AF   Assignment 2   due : Wednesday November 19

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

1. Could it be optimal to tax food and clothing both at a 50 percent rate, if the prices p_X and p_Y without tax were both 24 and if compensated demand functions for food and clothing were

$$X = \frac{36}{\sqrt{P_X}} + \sqrt{\frac{P_Y}{P_X}}$$

$$Y = \sqrt{\frac{P_X}{P_Y}} + \frac{144}{P_Y}$$

where X is the quantity demanded of food, Y the quantity demanded of clothing, and P_X and P_Y are the prices paid by consumers for food and clothing?

2. *i* If the government wanted to pay a cash grant G to every Canadian, and fund the grant by a proportional income tax at the rate t, what tax rate t would provide the largest possible grant, if the average income in Canada actually depended on the tax rate, so that the average income per person was $40(1 - t)$? Here income is measured in thousands of dollars per year, and the tax rate t is expressed as a fraction (so that $t = 0.9$ means a 90 percent tax rate).

ii Suppose that each Canadian's own income depended on her "ability", and on the tax rate t, so that a person's gross income would be $a(1 - t)$ if her ability were a.

If the average ability in Canada were $a = 40$, and if a grant were financed as in part i of the question, what tax rate would bring the highest possible net income to a person of the very lowest ability, $a = 0$?

3. A taxpayer wishes to decide the amount H of income that she will hide from the tax authorities. Her total income (in thousands of dollars per year) is 42. She faces a constant income tax rate of 40 percent on her reported income.

If she under–reports her income, the probability that she will be caught is $1/11$: this probability does not depend on how much income she hides. If she is caught, then she must pay all the tax she owes, plus a fine of F, plus a penalty of $H^2/10$, where H is the amount of income that she hides (in thousands of dollars)..

If she wishes to minimize the expected amount she must pay to the government, how much income should she hide from the tax authorities

    i if the fixed fine F (in thousands of dollars) is 22?
    ii if the fixed fine F (in thousands of dollars) is 55?

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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 $60,000 in salary. She estimates that the cost of commuting to and from work is $2000 a year. She received a gift of $20,000 from her parents. She also gave a gift of $10,000 to her daughter.

She rents an apartment and paid $18,000 in rent during the year. She also spent $10,000 on a vacation, and $20,000 on food, entertainment, personal travel, and similar personal expenses.

At the beginning of the year, she owned stock which was worth $100,000. During the year, the stock increased in value by $20,000. She also spent $10,000 during the year on shares in a mutual fund.

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

He earned $40,000 in salary. The company for which he works has a pension plan : he contributed $2000 of her own money to his company pension account, and his employer also contributed $2000.

In his spare time, the person buys and sells collectibles on the internet. During the year, he bought $30,000 worth of merchandise, and he sold it on the internet for $45,000. The costs of running this business (postage, website maintenance etcetera) were $5000.

He owns his own house, which was worth $200,000 at the beginning of the year, and $250,000 at the end of the year. Maintenance expenditures on the house, mortgage interest, and property taxes added up to $20,000. He estimates that the house would rent for $35,000 a year if it were rented to someone else. He also used one of the rooms in the house as an office for his collectible business : he estimates the space could have been rented out for $6000 a year.

He also had to pay $25,000 a year in alimony to his ex–wife.