If you have choice you may do any two of problems 1-3 for 15 points each. Cross out the one you do not do. If you do not have choice, do all three problems at 10 points each.

1. Suppose that the supply and demand of pickles is given below.

\[ Q_s = 60P \quad \text{and} \quad Q_d = 320 - 20P \]

a. Please calculate the equilibrium price and quantity of pickles. (You may do this through calculation, algebra or graphing.)

\[ Q_s = 60P = 320 - 20P = Q_d \]

b. If the government places a 50% excise tax on pickles, what price will consumers pay?

\[ \frac{Q_s}{Q_d} = \frac{60P}{320 - 20P} \]

\[ 60P = 320 - 20P \]

\[ 80P = 320 \]

\[ P = 4 \]

\[ Q_s = 60(4) = 240 \]

\[ Q_d = 320 - 20(4) = 320 - 80 = 240 \]

\[ \text{Old price} = 4 \]

\[ \text{New price} = 4 + 0.5(4) = 4 + 2 = 6 \]

\[ \text{New price with tax} = 6 \]

c. If the government places a 50% excise tax on pickles, what price will the sellers receive?

\[ \text{From (d)} \]

\[ Q_d = 213.33 \]

\[ Q_s = 60P \]

\[ 213.33 = 60P \]

\[ P = \frac{213.33}{60} = 3.56 \]

d. If the government places a 50% excise tax on pickles, what will the quantity be?

\[ Q_d = 213.33 \]

\[ \text{Old quantity} = 213.33 \]

\[ \text{New quantity} = 213.33 \]

e. What share of the tax do the firms pay and what share do the consumers pay? (There are several ways to arrive at the answer, but show your work.)

\[ \text{Firm receives} \quad 4 - 3.56 = 0.44 \]

\[ \text{Consumer pays} \quad 5.33 - 4 = 1.33 \]

\[ \frac{44}{1.33} = 33.22 \]

\[ \frac{1.33}{1.77} = 0.75 \]
a. What is the current highest marginal tax rate under the United States Personal Income tax system?

b. Suppose that Mario is a highly paid married plumber that can make $50 per hour before taxes and can work up to 100 hours per week. Let us assume he is in the top tax bracket. Draw his budget line in the graph provided, with income on the vertical axis and leisure on the horizontal. Number and label the axes.

c. Draw an indifference curve showing him working 40 hours per week. Label it $I_1$.

d. Suppose we reduce Mario's marginal tax rate by ten percentage points, e.g., if you answered 50\% in part a) it is now 40\%. Draw his new budget line.

e. Draw a new indifference curve that is consistent with the first one. Label it $I_2$.

f. What impact did this have on the number of hours Mario worked? (Both direction and amount.)

This is bigger than actual effect, let $e$

h. Suppose we reduced the taxes for Mrs. Mario as well. According to the evidence, is the effect on her greater, less or the same as on him?
3. a. Suppose my neighbor has a home that they recently bought for $300,000. Our property tax rate in Worthington is about 70 mils. How much do they pay in property taxes each year? (Hint: there is one other piece of information you need to remember to give the correct answer and Worthington is in Ohio.)

\[
\text{Tax at } \frac{352}{1000} \text{ of value of property } \\
\frac{300,000 \text{ mk. value}}{352} \text{ tax on } 352 \\
\frac{105,000}{105,000} \text{ taxable value } \\
70 \text{ mils } 70 \\
\frac{105,000}{70} \text{ tax } 1.50 \\
\]

b. Suppose the property tax in Delaware is 50 mils. What is the Tiebot model? Use the Delaware and Worthington tax rates in formulating your answer.

The Tiebot model says people will vote with them in a community that offers the level of taxes & services they prefer. If Worthington had high taxes, those who want that will there. Those that don't might move to Delaware.

c. In general, is the property tax progressive? Explain.

No. Despite some circuit breakers, we see as income rises, share of income taken in prop taxes falls.

d. The property tax is quite unpopular. Cite two reasons why people dislike it so much. (Note: in light of part c, do not use the degree of progressiveness.)

- It is a tax we can vote on and do something about.
- Value of house home to determine.
- Seen as a highly visible tax you pay out of pockets rather than one that is withheld.

e. Give an example, real or hypothetical, of land or property that would not be subject to a property tax.

- A church
- Corn & plywood
- A car or boat in Ohio

f. My wife wants to redo the kitchen. Does the property tax impact our decision? Explain.

Yes, if we improve our house our property tax will rise so we might be less likely to do this.
Part II. Shorter Problems. Do all 11. Six points each.

4. Suppose George’s marginal benefit of cigars is $MB = 10 - \frac{u}{2}$. The cost is $2, but each cigar causes $4 of negative externalities.

   a. What is the number of cigars George wishes to consume?

   \[ MB = 10 - \frac{u}{2} = 2 \]

   \[ \frac{u}{2} = 8 \]

   \[ u = 16 \]

   b. What is the socially optimal number of cigars?

   \[ MB = 10 - u = 2 + 4 \]

   \[ 4 = 8 \]

   c. What is a Pigouvian tax? At what level should it be set?

   A Pigouvian tax is a tax set so that the social cost equals the private cost.

   It should be set at \[ \frac{u}{2} \] the value of the externality.

5. a. Please carefully define the term public good.

   - It is non-rival in consumption. My consumption does not affect yours.
   - It is non-excludable, i.e., we can't exclude the non-payer.

   b. The City of Delaware provides police protection. Is this a public good? Explain.

   Yes. We can't exclude the non-payer. How can we stop an assault on only one person? It is non-rival as providing you does not really interfere with protecting me.

   c. The City of Delaware has a large public swimming pool with a daily fee. Is this a public good? Explain.

   No. Can and do exclude the non-payer.
6.a. Briefly describe Medicare. Who does it serve, what does it give them and how is it funded?

Medicare is a federal health insurance program for the elderly, (over 65) or subject to certain disability. It gives them subsidized doctors' visits, some hospital stay, and some health services and is funded through payroll tax and some general revenues, and is supposed to be self-sustaining.

b. What is adverse selection and how might it justify the government providing Medicare?

Those with the greatest health risk are the most likely to buy health insurance. Insurance companies don't know the full risk, but the people do. Those that are the biggest health risks are the most likely to buy the insurance causing firms to lose money.

c. We have discussed six reasons for the government to intervene in the economy as well as two other reasons. Cite two that are used to justify the government provision of health care. In a sentence, note how each may be viewed as a reason. (Do not, however, use adverse selection.)

- Income redistribution. Help low income people
- Externalities. Improved health will reduce the risk of disability and death
- Risk of disemployment. If people know they have health care, they will be less likely to lose their jobs.
- Economies of scale. The health care industry is less expensive when larger.
- Fairness. It is unfair that people who are unhealthy get paid to care for the elderly.
- Equal distribution. It is important to make sure that the elderly are taken care of.

7. a. How is Social Security funded in the United States?

Payroll tax

b. How are social security benefits determined in the United States?

They are based on one's earnings. The more you earned, the more you receive when you retire. Lower income, things, receive lower percentages of their avg earnings.

c. Suppose your grandmother would like to sell her home but is reluctant to do so as she is afraid that it will wind up reducing her social security benefits. What would you advise her to do? Why?

Sell her home if she wishes. The sale will have no impact on her social security benefits.
8. a. How is poverty defined in the United States?

In the 1960s the cost of a basic diet for a family of four was calculated. Low income families were expected to spend 40% of their income on food. So if the amount was

b. Approximately what share of the American population is classified as living in poverty?

12% of pop.

c. What is the Earned Income Tax Credit?

A program when the govern gives tax credit to low income workers.

d. Does Medicaid reduce the official poverty rate? Explain.

No. It is considered an in-kind transfer and does not affect the official poverty level.

9. Suppose that roads are a public good that are provided by state governments. Let us suppose that Ohio could have as much as $500 million spent on roads. Show the budget line for $500 million dollars of roads (horizontal axis) vs. private consumption (vertical axis.) Label it AB. Number and label both axes as well.

b. Draw an indifference curve that shows Ohio spending $300 million on roads. Label it I1.

c. Suppose the federal government gives a $300 million block grant to Ohio for roads. Show the new budget line and label it CD.

d. What is the new amount spent on roads? Use an indifference curve to show this amount and label the curve I2.
10. a. Please explain in words what excess burden represents.

Excess burden represents the loss in welfare caused by a tax because the number of dollars paid in tax.

b. Would an excise tax on Sony Playstations have a large excess burden? Explain?

Sony Playstations have several good substitutes. Placing a tax on them would cause people to switch to other goods. There would be little tax revenue and people would be less happy.

c. What is a head tax/poll tax? Would it have a large excess burden?

A tax where everyone pays the same amount. No excess burden at all.

11. a. What is the difference between an estate tax and an inheritance tax?

An estate tax is a tax on transferring wealth after death. The inheritance tax is a tax on receiving wealth from a deceased person.

b. What impact does an estate tax have on the type of assets people tend to hold? Explain.

It will cause the assets to be somewhat liquid as the tax must be paid. Also, it will encourage the estate to conservatively manage its resources so it can pay the tax.

c. What is the relation of the gift and the estate taxes in the United States?

They are integrated. All gifts over $13,000 per year count as giving money away and subject to tax.
12. Suppose that Caledonia has a tax system identical to the United States. The only difference is the tax rate there is:

<table>
<thead>
<tr>
<th>Taxable Income</th>
<th>Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-$10,000</td>
<td>10% of taxable of income</td>
</tr>
<tr>
<td>$10,000 and up</td>
<td>$1,000 + 20% of the amount of taxable income over $10,000</td>
</tr>
</tbody>
</table>

Suppose the standard deduction is $5,000 for a single person and the personal exemption is $3,200. Sarah has income of $40,000. Among her expenditures are $4,000 on interest on her mortgage, $200 of interest on her gasoline credit card, $2,500 in charitable donations and $350 in political expenses.

a. Calculate how much she owes in taxes.

\[
\text{Tax} = 1,000 + 0.20(30,000 - 20,000) = 1,000 + 0.20(10,000) = 5,000
\]

b. What is her marginal tax rate?

20%

c. What is her effective tax rate?

\[
\text{tax rate} = \frac{5,000}{40,000} = 12.5\%
\]
13. a. What impact does the United States Corporate Income Tax have on debt vs. equity financing? Explain.

b. According to the evidence, who pays the corporate income tax?

The evidence is not clean

c. Suppose that the Acme Anvil Corporation buys a machine that is supposed to last ten years. What impact does this have on their Corporate Income Tax? Does it take ten years to get all of their tax breaks? Explain.

14. a. In The Coming Generational Storm what do they see as the coming problem?

The future obligations from Social Security and Medicare, especially in light of changing demographic will lead to a financial burden that future generations might not be willing to bear.

b. Cite at least three of the changes they advocate for Social Security.