Name ____________________________

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Economics 378
Public Finance
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FINAL MID-TERM

You have 3 hours to complete this exam. No outside books, notes or tables are permitted. Please do all your work carefully and check your answers before handing the exam in. You are advised to show as much of your work as possible to facilitate the awarding of partial credit. Good Luck!

This exam counts for 25% of your final grade.

PLEASE NOTE:

If you have choice and elect to use it:
Do any four of problems 1-5 @ 15 points each.................................60 points
(Cross out problem you aren’t doing with X through entire problem)
Numbers 6-25 two points each..................................................40 points
Total..................................................................................100 points

If you have choice and elect NOT to use it OR don’t have choice:
Do problems 1-5 @ 12 points each..................................................60 points
(Cross out problem you aren’t doing with X through entire problem)
Numbers 6-25 two points each..................................................40 points
Total..................................................................................100 points
1. a. Please state an actual good that is subject to an excise tax.

- Cigarettes
- Alcohol
- Gasoline
- Beer
- Airline tickets
- Tires

b. We discussed three reasons why excise taxes are used. Please state them.

- Specific (sin) tax - don't make illegal but discourage use
- User fee
- Source of revenue

c. Take the good you mentioned in part a. Please explain the primary reason that this good is subject to an excise tax. Think in terms of why there is no excise tax on coffee (Thank God!) but there is one on the good you selected.

- Cigarettes (Specific tax)
- Gasoline (User fee. Revenues go for roads)
- Airline tickets (User fee for airports and security)
- Alcohol (Specific)
- Beer (Specific)
- Tires (User fee. Fees for roads)

d. Suppose the supply and demand for widgets is given by

\[ Q_s = 10P \quad Q_D = 400 - 10P \]

Please calculate the equilibrium price and quantity. (You may use algebra or graph it below. Show your Work.)

\[ Q_s = 10P = 400 - 10P = Q_D \]

\[ 20P = 400 \]
\[ P = 20 \]

\[ Q_s = 10 \times 20 = 200 = 200 \]

Problem 1 is continued on the next page
e. Calculate the price paid by the consumer if a $3 excise tax is placed on widgets.

\[ Q_s = 10P \]

so with tax

\[ Q_s + 3 = P \]

and

\[ Q_s = P - 3 \] \[ Q_o = 400 - 10P \]

\[ Q_o = 400 - 10 \times 21.5 \]

\[ P = 21.5 \]

f. What will be the quantity sold?

\[ Q_o = 400 - 10P \]

\[ = 400 - 10 \times 21.5 \]

\[ = 185 \]

f. What SHARE of the tax is paid by the consumer and what by the producer? (percent, please.)

Tax = $3

Consumer pays $1.50 more

So firm receives $1.50 less

50% Consumer

50% Firm

$3

h. How much tax revenue will be collected by the government?

\[ Tax \times Q = 3 \times 185 = 555 \]

i. What is the deadweight loss associated with this tax?

\[ \frac{1}{2}(\Delta Q)(\text{tax}) = \frac{1}{2} \times 15 \times 3 = 22.5 \]

j. Please explain what the deadweight loss in part (i) means in terms of widgets and taxes.

Although the tax raises $555, it also causes a loss of $22.50 in surplus (consumer and producer) to the firms and the consumers.
2. Suppose that you could choose to work anywhere from 0 up to 2,000 hours per year. Your wage is $25 per hour.

\[ \text{Income} \quad \text{Leisure} \]

| $50,000 | 400 |
| $40,000 | 800 |
| $30,000 | 1,200 |
| $20,000 | 1,600 |
| $10,000 | 2,000 |

a. In the graph above, draw your budget line. Label it AB.

b. In the graph, draw an indifference curve that has you working 1,200 hours. Label it I₁.

\[ \text{So leisure} = 800 \text{ hrs} \]

c. Suppose that the government now introduces a tax of 40% on employment income. Draw the new budget line and label it CD.

\[ \text{Now, net wage} = 815/\text{hr.} \]
\[ \text{max inc} = 815 \times 2,000 = 30,300 \]

d. There are many possible indifference curves. Please draw one that shows hours worked at 1,000 and is possible in light of I₁. Label it I₂.

e. Is the income or substitution greater? Explain how you can tell. In your answer, please be sure to discuss what each effect means in terms of wages and leisure.

As wage rises, works more hours, i.e., less leisure. So substitution effect is greater.

Subst. effect. As wage rises price of leisure rises and consume less and work more like higher income with more potential income. Buy more leisure.

f. Is this impact you found consistent with the effect of taxes changes on married women with high income husbands? Explain why the effect of taxes on these women is what it is.

Yes, it is consistent. As their wages rise they work more hours. These women can and do work 24 hours worked with wage changes. Increased wages...
3. a. Not all property is subject to a property tax. Give an example of such a property.
- Churches
- Gov't buildings
- Aqua (in Ohio)

b. Ohio exempts a certain share of the value of the property from taxation and places a tax on the remainder. What share of the value of property is subject to a property tax in Ohio?

35%

c. Suppose that we have two families living in Delaware, OHIO. Their incomes and home values are given below.

<table>
<thead>
<tr>
<th>Family</th>
<th>Value of House</th>
<th>Annual Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burns</td>
<td>$500,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Simpsons</td>
<td>$100,000</td>
<td>$30,000</td>
</tr>
</tbody>
</table>

If the tax rate in Delaware is 40 mils, calculate the property tax owed by each family.

\[
\text{Value for Tax} = \text{Value of House} \times \text{Tax Rate} \\
\text{Property Tax} = \frac{\text{Value for Tax}}{100} \times 35\% \\
\text{Taxes} = \frac{\text{Property Tax}}{\text{Income}} \times 100
\]

Burns: 
- Value of House: $500,000
- Tax Rate: 40 mils
- Value for Tax: $150,000
- Property Tax: $52,500
- Taxes: 42

Simpsons: 
- Value of House: $100,000
- Tax Rate: 40 mils
- Value for Tax: $35,000
- Property Tax: $12,600
- Taxes: 42

4/3

4/3

d. Is the tax a progressive (graduated), proportional or regressive? Explain how you can tell.

\[
\text{Taxes} = \frac{\text{Property Tax}}{\text{Income}} \times 100
\]

Burns: 
- Property Tax: $52,500
- Income: $100,000
- Taxes: 52.5%

Simpsons: 
- Property Tax: $12,600
- Income: $30,000
- Taxes: 42%

4, 672 Share paid in personal property

4/3

e. Explain what is meant by a circuit breaker in this context.

In order to give low income and/or elderly property owners a tax break, they are allowed to exclude a certain share of their property from taxation.
4. Suppose we assume that the tax table for the United States is given in the table below.

<table>
<thead>
<tr>
<th>Taxable Income is over</th>
<th>But Taxable Income is not over</th>
<th>The Tax is:</th>
<th>Of the amount over</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$10,000</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>$10,000</td>
<td>$30,000</td>
<td>20%</td>
<td>$10,000</td>
</tr>
<tr>
<td>$30,000</td>
<td></td>
<td>$4,000 + 30%</td>
<td>$30,000</td>
</tr>
</tbody>
</table>

Suppose that the Burton family, Bob, Betty and the baby (Billy), have income of $70,000 from Mrs. Burton’s jobs, $1,000 in interest, a capital gain of $2,500 on a stock they held for two months.

Among their expenses are $250 a snow blower, $10,000 on charitable donations, $7,000 in local property taxes and $550 for diapers for their infant child.

You may assume the standard deduction is $10,700 and the personal exemption $3,400.

a. Please calculate the lowest legal tax liability the Burtons owe the federal government. Show your work and label it to facilitate the awarding of partial credit.

b. What is their effective tax rate?

What is their marginal tax rate?
5. a. Suppose the demand for a product is \( Q_D = 240 - 2P \) and the supply is \( Q_S = 4P \). Calculate the equilibrium price and quantity. (You may use algebra in the graph below.)

\[
\begin{align*}
Q_D &= 240 - 2P \\
Q_S &= 4P
\end{align*}
\]

\[
\frac{Q_D}{Q_S} = 60 - 2P = 4P = Q_S
\]

\[
240 - 2P = 4P \\
240 = 6P \\
40 = P
\]

\[
Q_S = 4 \times 40 = 160
\]

b. What if the marginal external damage was equal to \( MD = 10 \). What would be the socially optimal price and quantity?

\[
Q_S = 4P \\
25Q_S + 10 = P
\]

Now must include the 10 in price

\[
25 \times 40 + 10 = P
\]

\[
Q_S = 240 - 2P
\]

\[
Q_S = 4P - 40
\]

\[
Q_S = 4 \times 146.7 = 146.7
\]

\[
Q_S = 240 - 2 \times 146.7
\]

\[
Q_S = 146.7
\]

c. What is a Pigouvian tax and what would be the optimal level of such a tax in this case?

\[
$10 \text{ (The externality)}
\]

d. Note that we have said in part b that the marginal damage was constant at 10. In light of the readings we did for the book discussion, is it realistic to assume that people would value a change in the quantity you gave in part (a) to the quantity you gave in part (b) the same as they might value a change in the opposite direction? Which might be greater and why? Discuss in terms of the readings.

No. We saw that the value of losing something (clean environment) is valued more than a gain. In other words, people value the loss of something more than the gain. For example, if we no poll in and \( Q = 146.7 \), people would place higher value on clean environment than if we went in opposite direction. (Reading "Value")

e. How might economists or others arrive at a figure of 10 for the marginal damage, i.e., in the real world how do we determine the dollar value of pollution?

Several ways:
- Conduct surveys to consumers about what willing to pay to clean up or avoid damage,
- Calculate cost of cleaning up.
6. If one person consumes a good that means that no other person can consume it at all, then that good is which of the following?
   A) excludable
   B) non-excludable
   C) purely rival
   D) partially rival
   E) both a and c

7. If the present discounted value of $134 next year is $115 this year, then what is the implied annual rate of interest?
   A) 7.63%
   B) 9.5%
   C) 13.34%
   D) 19%
   E) none of the above

8. If utilities pollute the air “too much” in private equilibrium, corrective taxation of the utilities would:
   A) reduce pollution.
   B) shift the private marginal cost curve downward.
   C) shift the private marginal cost curve upward.
   D) both a and b.
   E) both a and c.

9. Complete the following sentence: In the United States from 1980 to the present, the share of income accruing to the bottom income quintile fell and the share accruing to the top income quintile grew.
   A) fell; fell
   B) did not change; fell
   C) grew; grew
   D) grew; fell
   E) fell; grew

10. In what way is instituting a work or training requirement in a welfare program an ordeal mechanism?
    A) It imposes a cost on high-ability individuals who want to receive welfare only to increase their leisure. I won't do it. I have better options.
    B) It prevents those receiving welfare from doing so for longer than society deems optimal.
    C) It provides a long-term solution to the problems of those receiving welfare.
    D) Both b and c are correct.
    E) None of the above is correct.
11. Which of the following suggests that education has a positive externality?
A) More educated people are more productive and receive higher wages.
B) More educated people make their co-workers more productive.
C) More educated people receive higher wages and pay more taxes.
D) All of the above are correct.
E) Both b and c are correct.

12. In general, for a given level of income, which of the following is true of Social Security?
A) Females have higher Social Security Wealth than do males.
B) Singles have higher Social Security Wealth than do married people.
C) Currently, the poor lose and the rich win from Social Security.
D) All of the above are correct.
E) Both a and c are correct.

13. Approximately what percentage of individuals with private insurance is part of the group insurance market?
A) 14%
B) 20%
C) 30%
D) 40%
E) 50%

14. According to the notion that “flat of the curve” medicine is practiced in the United States, which of the following best describes the marginal health benefit from the next dollar of medical spending?
A) It decreases as more is spent on health care.
B) It increases as more is spent on health care.
C) It first increases and then decreases as more is spent on health care.
D) It is constant.
E) It first decreases and then increases as more is spent on health care.

15. Medicaid provides health insurance to which group?
A) poor families
B) all elderly over age 65
C) disabled persons under age 65
D) both b and c
E) none of the above
16. Which of the following items will be the largest tax expenditure of the federal government in 2007?
   A) exclusion of pension contributions and earnings: 401(k) plans
   B) deductibility of state and local taxes
   C) exclusion of employer contributions for medical insurance from taxable income
   D) deductibility of home mortgage interest
   E) child credit

17. All other things equal, consumers bear more of a tax as demand becomes more _inelastic_ and supply becomes more _elastic_.
   A) unit elastic; unit elastic
   B) elastic; elastic
   C) inelastic; inelastic
   D) elastic; inelastic
   E) inelastic; elastic

18. Which of the following statements is true?
   A) The nominal rate of interest is the real rate of interest plus the rate of inflation.
   B) The nominal rate of interest measures a person's actual improvement in purchasing power due to savings.
   C) The real rate of interest is equal to the rate of inflation times two.
   D) Both a and b are true.
   E) None of the above statements is true.

19. The vast majority of large corporations face which of the following tax rates?
   A) 0%
   B) 5%
   C) 10%
   D) 25%
   E) 35%

20. Allowing firms to have their property taxes only be used for projects that benefit them is called?
   A) Circuit breakers
   B) Implicit taxes
   C) Tax Incremental Financing
   D) Negative Assessment
   E) None of the above
21. Which United States tax is the least progressive/most regressive?
   A) Estate Taxes
   B) Excise Taxes
   C) Inheritance Taxes
   D) Payroll Taxes
   E) Personal Income Tax

22. Which of the following statements is true about the United States tax system?
   A) There is no federal inheritance tax
   B) The estate and gift taxes are integrated.
   C) Capital gains are not taxed if the asset is passed on at death.
   D) Both a and c are true.
   E) A, b and c are all true.

23. Which of the following goods is the best example of a network externality?
   A) Soft drinks in non-recyclable containers.
   B) Sulfur dioxide emissions from a power plant.
   C) Two roommates attempting to determine quiet hours.
   D) People receiving flu shots.
   E) The Internet.

24. Which of the following statements are true about the United States Corporate Income Tax?
   A) It gives an incentive to us equity financing over debt financing.
   B) In the United States, people who receive dividends also receive a credit under the Personal Income Tax to recognize the Corporate Income Tax paid on their shares.
   C) The current Investment Tax Credit is 7%.
   D) Firms can depreciate equipment at an accelerated pace, compared to the actual expected lifetime.
   E) President Bush signed legislation allowing the Corporate Income to be phased out by 2010.