

**ECON 445**  
Spring 2007  
Professor Paul Rothstein

**Final Exam**  
**May 8**

Please:

1. Write your name on all of your answer books.
2. The exam is worth 240 points. This is 40% of your grade. There were 603 points in the course overall, excluding bonus points.
3. There are 30 questions in total, each worth 8 points.  
Answer all questions.
4. You have 110 minutes for the exam. Note the suggested times for each section. They total up to 107 minutes.

### Section I: Definitions

(Suggested time 18 minutes)

(48 points: 6 questions each worth 8 points)

Define the following terms. Be precise.

1. Earned income.
2. The “value added” at a stage of production.
3. In models of taxation, the “net price.”
4. Step-up in basis (note: you do not have to define “basis” and you can use that word in your answer).
5. The social security “legacy debt.”
6. Public good.

### SECTION II: True/False and Explain If False

(Suggested time 36 minutes)

(96 points: 12 questions each worth 8 points)

State whether each of the following statements is true or false. If false, explain your answer convincingly.

7. An example of an ad valorem tax is the federal gasoline tax (which is *truly* 18.4 cents per gallon).
8. The linear tax schedule  $\text{Tax} = a + b\text{TI}$ , where TI is taxable income, is regressive if  $a < 0$  and  $b > 0$ .
9. Under the equal sacrifice principle of fairness in taxation, average tax rates increase with income.
10. An estate bequeathed to an heir is not taxable income to the heir.
11. When the income effect (globally) dominates the substitution effect, an increase in the net-of-tax interest rate will cause the quantity of savings supplied to increase.
12. The excess burden of a commodity tax increases linearly with the tax rate.

13. The Flat Tax modifies the Value Added Tax by having individuals pay tax on their wages and salaries above an exemption.
14. A table of numbers showing the gross incomes and tax payments for a list of people is sufficient information to know the “incidence” (as economists define that term) of the tax on these people.
15. You are eligible for unemployment insurance even if you quit your job.
16. An example of adverse selection is that an increase in disability insurance benefits causes an increase in the number of workers claiming the benefits.
17. The fundamental benefit provided by insurance (either private insurance or social insurance) is consumption smoothing.
18. Rational individuals obtain little benefit from insurance that protects them against low probability events.

### SECTION III: Problems to Solve

(Suggested time 30 minutes)

(48 points: 6 questions each worth 8 points)

19. Suppose the initial tax on wages is  $t$ . By definition,  $w_N^0 = (1 - t)w_G^0$ . Now suppose the tax increases to  $t'$ , so  $t' > t$ . By definition  $w_N' = (1 - t')w_G'$ . Assume the labor supply curve is flat. What is the relationship between  $w_N'$  and  $w_N$  and between  $w_G'$  and  $w_G$ ?
20. Recall the general model of leisure today, consumption today and consumption tomorrow without taxes:

$$U(\lambda, C_1, C_2)$$

$$Y = w(24 - \lambda)$$

$$C_1 = (Y - S)$$

$$C_2 = (1 + r)S$$

Introduce a tax on wages and derive the budget constraint. Then, show that there is no substitution effect on the choice of consumption today and consumption tomorrow.

21. From an analytic perspective, a subsidy is nothing more than a negative excise tax that confers a benefit to certain groups rather than imposing a burden on them. For decades, the federal government has given fairly large subsidies to farmers for producing everything from grain to honey.

Draw two graphs illustrating conditions of supply and demand such that the subsidy would be passed along to consumers, lowering the price they pay for honey (for example).

22. “The Energy Policy Act of 1992 (P.L. 102-486) created a new federal tax deduction...for individuals or businesses that purchase vehicles that run on alternative fuels.... Taxpayers can deduct from adjusted gross income a portion of the costs associated with the purchase of dedicated alternative fuel vehicles (AFVs).... Dedicated AFV’s are new vehicles designed to run on an alternative fuel only. For dedicated AFVs, costs up to \$2,000 for qualified property can be deducted for a vehicle up to 10,000 lbs., up to \$5,000 for a truck or van of 10,000 to 26,000 lbs., and up to \$50,000 for a truck or van over 26,000 lbs.” (Congressional Research Service report 97-416.)

Consider the following scheme (surely illegal). Gordon is in the 30% tax bracket. He purchases a dedicated AFV over 26,000 pounds for \$200,000, sells it the next day for \$190,000, and claims the \$50,000 tax deduction. How much money has he made? Show your work.

23. Suppose 10 people each have the demand  $Q = 20 - 4P$  for streetlights, and 5 people each have the demand  $Q = 18 - 2P$  for streetlights. The cost of building each streetlight is 3. If it is impossible to purchase a fractional number of streetlights (and we regard streetlights as a pure public good), how many streetlights are socially optimal? Show your work.
24. The Economics Department is having a barbecue for graduating seniors and their families on Thursday, May 17. The probability of rain is .3. If we hold the event indoors the payoff is 500 whether it rains or not. If we hold the event outdoors, the payoff is 1000 if it is sunny and zero if it rains. Which action – holding the event indoors or holding it outdoors – maximizes our expected payoff? Show your work!

#### SECTION IV: Short Answer

(Suggested time 26 minutes)

(48 points: 6 questions each worth 8 points)

25. Senator Smith suggests eliminating the employee portion of the social security tax and doubling the employer portion of the tax. What does economic theory tell us should happen to the cost of labor (from the point of view of the firm) and the return to working (from the point of view of the worker)? Why?
26. In 2008 (under current law), which of these two groups has the higher percentage of people subject to the Alternative Minimum Tax, people making \$100,000 to \$200,000 or people making over \$1,000,000? Why?
27. *NOTE: The following is to be used for questions 27-28.*

Suppose there are two enclaves in a city, one with healthy people and one with sick people. Both types have the same income. Insurers in the town offer full insurance at the “market wide” actuarially fair premium.

Suppose both types actually buy the insurance. Is the outcome efficient? Explain.
28. If both types buy the insurance, which type is being subsidized?
29. Recall that the market failure that justifies having social insurance programs is adverse selection. What kind of adverse selection is associated with the social security pension program?
30. What kind of adverse selection is associated with the unemployment insurance program?