YOUR NAME:_____ Tuesday, April 4, 2000

YOUR NUMBER:

Second Exam
Economics 304K
Professor R. P. McAfee **University of Texas at Austin**

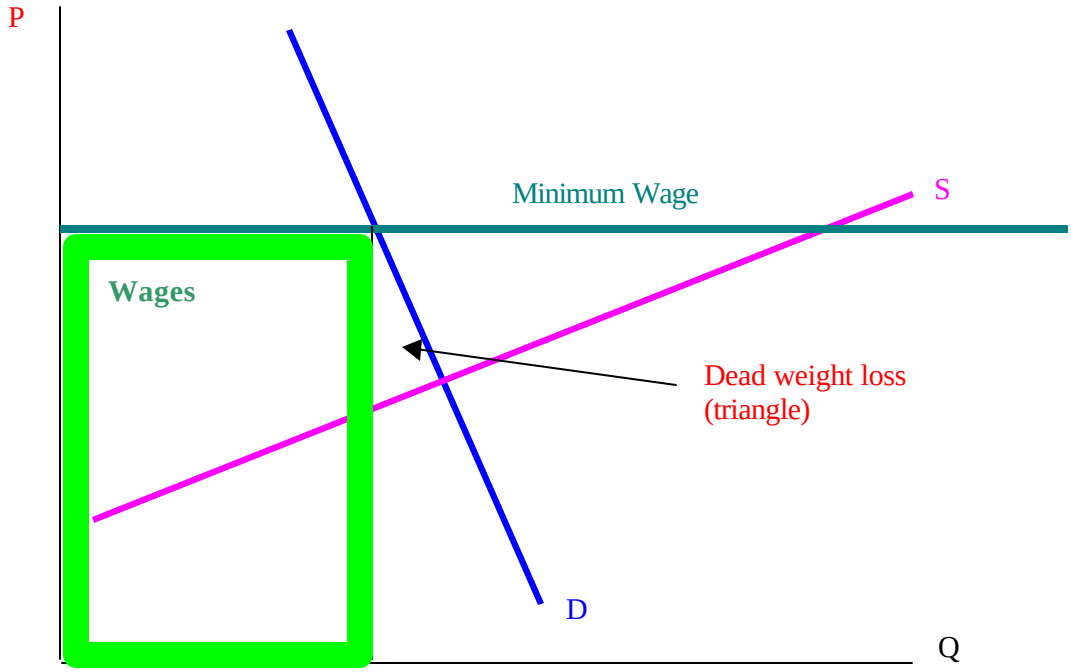
Instructions: You will have 75 minutes for the exam. Do not cheat. Raise your hand if you have a question, but continue to work on the exam while waiting for your question to be answered. Allocate your time like an economist would - do the easy questions first. Short answer questions should not require more than two lines. Question values sum to 100.

1. (10 points) Fill in the following table. Ignore blacked out spaces.

Output	Total Cost	Variable Cost	Fixed Cost	Marginal Cost	Average Total Cost	Average Variable Cost	Average Fixed Cost
0	6	0	6				
1	12	6	6	6	12	6	6
2	20	14	6	8	10	7	3
3	30	24	6	10	10	8	2
4	42	36	6	12	10.5	9	1.5
5	56	50	6	14	11.2	10	1.2

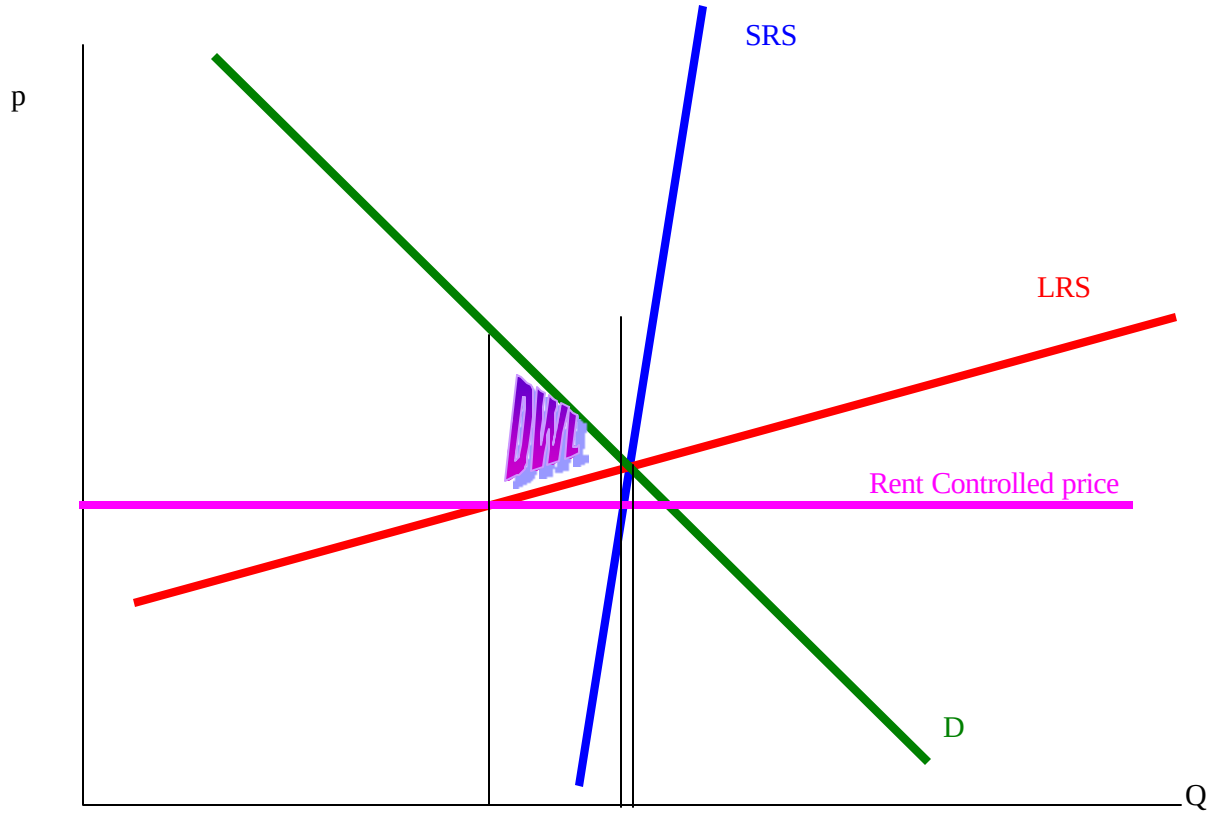
2. (10 points) When does an increased minimum wage increase the total wages earned by low income workers? Illustrate your answer with a supply and demand diagram, and note the dead-weight loss and wages paid to low wage workers on the diagram.

An increase in the wage increases the total payments if the demand for labor is inelastic.



3. (10 points) Tom Hayden, state senator from Santa Monica, announces that Santa Monica's new rent control program had lowered rents to the needy but left the number of apartments the same as prevailed before the law. How does this fit with your understanding of rent control laws? Illustrate your answer with a diagram, and note both long and short run effects on the quantity of housing and the dead weight loss. Why are rent control laws politically attractive?

In the short run, the supply of housing is very inelastic, and thus a rent control law will have little effect on the quantity supplied. Over a longer period of time, however, the quantity supplied will tend to decline as apartments are converted to condos or single family homes. Rent control laws are politically attractive because they harm a small number of landlords in the short run, while helping a large number of apartment dwellers, with the ill-effects felt most strongly in the future.



Small short run reduction in Q,
larger long run reduction

4. (10 points) Softhead, Inc. spent $1,000,000 to develop its only product, *Softy*, a computer program. The program is free to produce. 1000 customers value *Softy* at $500, 5000 customers value *Softy* at $200, and 5,000 customers value *Softy* at $100. What is the monopoly price? What is the dead weight loss (excess burden) associated with monopoly?

The monopoly price is $200, producing a revenue of 6000 customers X $200, or $1,200,000, which exceeds the $500,000 revenue for a $500 price, or the $1,100,000 revenue from selling 11,000 copies at a price of $100. The dead weight loss is the value of the sales to the $100 customers, which are worth $500,000.

5. (10 points) Austin Power produced 200 tons of CO each day in 1999, and Nasty Power, Inc. produced 100 tons per day. Austin Power can reduce its pollution at a cost of $1000 per ton, while Nasty can reduce its pollution at a cost of $500 per ton.

   (i) If both are required to reduce pollution by 50% of the 1999 level, what is the total cost of the reduction?

Austin's reduction costs $1000 per ton, times 100 tons, for a total of $100,000 per day. Nasty costs $500 per ton over 50 tons, for a total cost of $25,000 per day. The total cost of the reduction is $125,000.

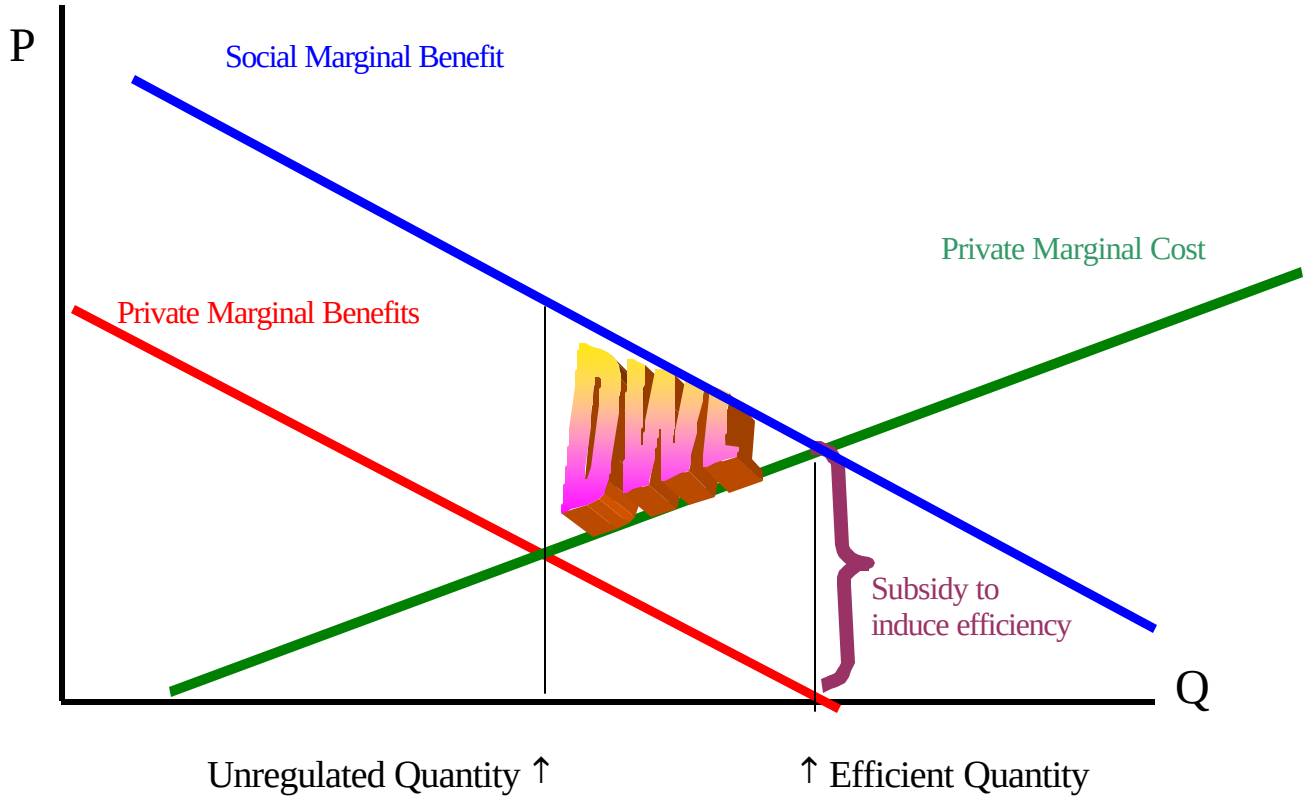
   (ii) Now suppose that the permits are tradable and each company is given permits for 50% of its 1999 pollution. What is the total cost of the pollution and how much does each company produce?

Because Nasty can reduce its pollution at a lower cost than Austin, Nasty will sell its permits to Austin. Nasty has permits for 50 tons, and sells all of them to Austin. Thus, Nasty reduces to zero, at a cost of $500 per day, times 100 tons, or $50,000. Austin must reduce an additional 50 tons (because it buys 50 tons worth of permits from Nasty – all that Nasty produces) at a cost of $50,000. Thus, the social cost is $100,000.

6. (5 points) How does a Saturday night stay-over requirement help airlines to price discriminate? No diagrams are necessary.

Tourist travelers are generally willing to stay over a Saturday night, while business travelers generally are not. Thus, the Saturday night stayover requirement helps the airline charge different prices to tourists and to business travelers, who have distinct demands.

7. (10 points) Draw the private marginal cost, private marginal value, and social marginal value for a good with a positive externality. Use smooth curves. Identify demand and supply, and the quantity that arises with no intervention, and the socially optimal quantity. Shade the region which represents the dead weight loss when no subsidy is used. Identify the size of the per unit subsidy needed to induce the socially efficient quantity.



8. (5 points) Without external enforcement, cartels in experiment 7.2 broke down. What economic force caused the breakdown of the cartels?

Each seller had an incentive to sell more units than the cartel agreement, because price exceed marginal cost at the cartel agreement. The economic force is the free-rider problem.

9. (5 points) Describe how price discrimination helped sellers in experiment 7.3, but not in 7.4 (where buyers could sell to each other).

In experiment 7.3, sellers could lower the price to students, who had a lower value for the good than non-students. This didn't work in 7.4, because of arbitrage: students could resell to non-students.

10. (5 points) What is an advantage of price regulation over rate-of-return regulation?

Price regulation gives strong incentives to minimize cost.

11. (10 points) In experiment 6.4, permits to pollute were distributed to some participants, and then resale of permits was permitted. What are the benefits of permit resale?

The permits are used for the most valuable transactions and not wasted on low-value transactions.

12. Consider the market for a good that generates harmful pollution. In particular, every unit of the good that is produced imposes $3 of pollution damage on society. Participating in this market are 12 consumers, each of whom will buy at most one unit of the good, and 11 suppliers, each of whom will sell at most one unit of the good. The distribution of buyer values (or buyer reservation prices) is as follows:

Buyer Value	Number of Buyers
$1	2
$3	4
$5	3
$9	3

The distribution of seller costs (or seller reservation prices) is as follows:

Seller Cost	Number of Sellers	Marginal Social Cost
$2	2	$5
$4	5	$7
$6	4	$9

(i) Without any intervention in this market, how many units of the good would be produced in a competitive equilibrium?

(ii) How many units of the good should be produced to obtain the socially efficient outcome?

(iii) Under these circumstances, what is the deadweight loss associated with the competitive equilibrium?

Price	Demand	Supply
$9	3	11
$6	3	11
$5	6	7
$4	6	7
$3.99	6	2
$3	10	2

The unregulated equilibrium has a price of $4, and 6 transactions. The socially efficient outcome arises when the sellers experience an additional $3 in costs, and thus the price will be $7, with 3 transactions.

Price	Demand	Supply
$9	3	11
$7	3	7
$6.99	3	2

There were 3 transactions which privately produced $1 in surplus but imposed a social cost of $3, for a net social loss of $2 per transactions, or $6 total loss.