

Final
PAI 897, Fall 2013
Professor John McPeak

Name: _____

The total exam is worth 25 points. Each numbered question is worth 2 ½ points, and each sub question within a numbered question is worth an equal share of the 2 ½ points.

1) Taxes and Subsidies

- a. Show the impact of a specific tax of size τ per unit placed on consumers. Note the price paid by consumers, the price received by producers, the equilibrium quantity and the tax revenue, and contrast this to the pre-tax price quantity pair.

- b. Show the impact of a subsidy of size σ per unit paid to producers. Note the price paid by consumers, the price received by producers, the equilibrium quantity and the total size of the subsidy, and contrast this to the pre-subsidy price quantity pair.

c. Show the impact of an ad valorem tax rate α placed on consumers. Note the price paid by consumers, the price received by producers, the equilibrium quantity and the tax revenue, and contrast this to the pre-tax price quantity pair.

d. Provide an example of a policy issue where a tax such as the one you drew for part (a) would be an appropriate policy response.

e. Provide an example of a policy issue where the subsidy such as the one you drew in part (b) would be an appropriate policy response.

2) Monopoly.

- a. Illustrate on a graph the difference between a monopoly outcome and a perfectly competitive market outcome. Identify areas corresponding to producer surplus, consumer surplus, and deadweight loss.

- b. Contrast the monopoly outcome with the outcome of breaking up the monopoly to arrive at a perfectly competitive outcome in terms of the transfer of economic benefit and the creation of economic benefit.

- c. What is a natural monopoly and why is it likely to occur in (for example) residential energy delivery?

3) The own price demand elasticity for rubber band looms is -0.25 .

- a. Is the own price demand elasticity for rubber band looms infinitely inelastic, inelastic, perfectly inelastic, elastic, unit elastic, or infinitely elastic?

- b. Over the past six months, the price of rubber band looms has increased 20%. By what percent (and in a positive or negative direction) has quantity sold changed according to the elasticity given above?

- c. Assume the supply elasticity is 0.95 . If we impose a specific tax on rubber band looms (to internalize the negative externality of rubber bands scattered around residences!!!!), who will bear a higher share of the tax incidence, producers or consumers? Why?

4) The demand curve is given to you as $q=500-80*p$.

a. Fill out the following table (use the relatively higher price / relatively lower quantity pair for the elasticity calculation)

Price	Quantity	Elasticity
1		-----
2		
3		
4		
5		
6		

b. Draw this demand curve with price on the y-axis and quantity on the x – axis. Identify the range over which this curve is elastic or inelastic.

5) Circle the correct answer.

Statement	The statement is (circle the correct answer)	
The expansion path traces out all points that are economically efficient.	True	False
Producer surplus is calculated as the area below the demand curve and above the price line.	True	False
The cross price elasticity of a complement is a positive number.	True	False
The income elasticity of demand for a normal good is a positive number.	True	False
The internal rate of return is the value of r at which present value benefits equal present value costs for a project.	True	False
Increasing the discount rate increases the present value of future costs and benefits.	True	False
Coase's solution to the problem of negative externalities is to reduce emission quantity to where the marginal social cost of the emission equals the marginal cost of abatement.	True	False
Economic efficiency is a necessary but not sufficient condition for technological efficiency.	True	False
The societal demand curve for a public good is derived by horizontal summation of the quantity each individual demands at a given price.	True	False
A Gini coefficient for the distribution of income increases from 0.5 to 0.6 over a ten year period. This indicates income inequality is increasing over the ten year period.	True	False

6) Budget Constraints. There are two goods, food (f) and other (o). The price of food is p_f , the price of other is p_o . Income is Y . Hence the budget constraint is $p_f \cdot f + p_o \cdot o = Y$.

a. Draw the budget constraint and indifference curves for a consumer showing the optimal bundle with the original budget line and after the consumer has received food stamps of cash value FS .

b. Draw the budget constraint and indifference curves for a consumer showing the optimal bundle with the original budget line and after the consumer has received a matching grant of size S for each unit of food purchased at price p_f .

c. Contrast and explain the consumption levels of food and other before and after subsidies were given in parts (a) and (b).

8) Our project is trying to improve the income of livestock producers in northern Mali. The project we are proposing is to train producers in the production and use of animal feeds. Research has shown that a fattened animal sells for more than a non-fattened animal all else equal. However, it costs money to train people in the use of feeds, and it costs money to produce the feeds. We are considering implementing such a project. It is a three year project ($t=0$, $t=1$, and $t=2$). Benefits in $t=0$ are 0 million (m), in $t=1$ are 3m, and in $t=2$ are 4m. These benefits are the aggregate value added by fattening compared to not fattening. The costs of training people in the use of feeds in $t=0$ are 1m, in $t=1$ are 2m, and in $t=2$ are 1m. The costs of producing the feed in $t=0$ is 0m, in $t=1$ is 1m and in $t=2$ it is 1m.

a. If the discount rate is 10%, should this project be implemented or not according to an evaluation of NPV over the three year time horizon?

b. Assume $t=2$ costs of feed and benefits of fattening will continue on in years $t=3$ and there are no further training costs. Will the project pass a test if we consider it over a four year time horizon?

c. How much more or less attractive in NPV terms is the project if the discount rate is 5% considered over the four year horizon?

- 9) The faculty of the PAIA department have brought in three candidates, Kristof, Monica, and Esmeralda. Kristof is the most international in his research agenda and appeals to the international relations / Security oriented faculty, and their second choice is Esmeralda. Monica is a management scholar, and appeals to the management faculty, who have as a second choice Kristof. Esmeralda is the most quantitative and appeals to the econ and stats faculty who have as a second choice Monica.

Preferences over Candidates				
	First Choice	Second Choice	Third Choice	Percent of the vote
IR / Security	Kristof	Esmeralda	Monica	20%
Management	Monica	Kristof	Esmeralda	45%
Econ and Stats	Esmeralda	Monica	Kristof	35%

For each agenda, describe the voting in each round and the final outcome.

- a. Monica versus Esmeralda, then winner takes on Kristof

- b. Kristof versus Monica, winner takes on Esmeralda

- c. Esmeralda versus Kristof, winner takes on Monica

- d. Ross has asked me to arrange a vote of the faculty on these candidates and I am part of the econ and stats faction. I deviously arrange things so that Esmeralda is the winner. The Management faculty find out about this. Illustrate Hirschman's concepts of Exit and Voice by describing responses they could take.

10) Syracuse is considering opening a sewage treatment plant that will release treated water into Onondaga Lake. The Onondaga Yacht club members sail yachts in this lake. The Yacht club is trying to decide on the membership fee they should charge this year. The Onondaga Yacht club can charge nothing, have no members and make no profit, set a fee of \$100 per person and have the profits listed in the table, or a \$200 per person fee and have the profit listed in the table. The payoffs to Syracuse are cost reductions from the current level for sewage treatment. Syracuse can choose no plant, a small plant, or a large plant.

		Onondaga Yacht Club					
		No fee		\$100 fee		\$200 fee	
Syracuse sewage treatment	No plant	0	0	0	14,000	0	15,000
	Small plant	10,000	0	10,000	10,000	10,000	5,000
	Large plant	15,000	0	15,000	2,000	15,000	-3,000

- a) Describe the full set of best response strategies and the Nash Equilibrium outcome of this game.

A court has passed a judgment that Onondaga Yacht club must be compensated by Syracuse by \$7,000 if the small plant is built and \$14,000 if the large plant is built. The following payoffs result.

		Onondaga Yacht Club					
		No fee		\$100 fee		\$200 fee	
Syracuse sewage treatment	No plant	0	0	0	14,000	0	15,000
	Small plant	3,000	7,000	3,000	17,000	3,000	12,000
	Large plant	1,000	14,000	1,000	16,000	1,000	11,000

- b) Describe the full set of best response strategies and the Nash Equilibrium outcome of this game.

- c) Contrast these outcomes in terms of the sum of the payoffs to the two players to contrast the concepts of Pareto optimal and Pareto improving.

Work Page: