Final Name: _____
PPA 723, Fall 2009

The total final is worth 30 points. Each question is worth 2 points, and each sub question is worth an equal share of the 2 points.

1) A food stamp policy is put in place in a state. The initial budget constraint is $y = p_f \cdot f + p_o \cdot o$, where f is food, o is all other goods, and the two prices are subscripted by their commodity. For our representative consumer impacted by this policy, their initial income y = $2000 is supplemented by a cash value of food stamps of $200. The price of food is $10 per unit, the price of the other good is $20 per unit.

a. Draw the original budget line and the budget line after the food stamp policy is implemented.

b. Reproduce your graph for (a), and then place on the graph indifference curves for a consumer who is made **equally well off** if we give the consumer $200 in food stamps or $200 in cash.

2) If p_1 = \$2, p_2=\$5, and Y=\$100

a. Draw the budget constraint.

b. Show how you can derive the price consumption curve for a given consumer's preferences (drawn as you like so long as they obey the properties of indifference curves discussed in class) using the example of the budget line from (a) with p_1 = \$2, with p_1 = \$4 all else constant, and with a budget line of p_1 = \$1 all else constant.

c. Show how to derive the individual's demand curve from the graph in (b).

3) Market structure and externalities. The inverse demand curve is given as $p=58-q$. The supply curve is $p=10+2q$.

a. What is the equilibrium price quantity pair if the market structure is perfectly competitive?

b. If there is a marginal externality generated by production of the good equal to q ($MC^E=q$), what is the socially optimal price quantity pair?

c. What specific tax τ could be placed on the producers in the perfectly competitive market to arrive at the socially optimal price quantity pair?

4) The own price demand elasticity was given in the lecture notes for some goods and services:

	Short Run	Long Run
Gasoline	-0.2	-0.5
HH Electricity	-0.1	-1.9
Air Travel	-0.1	-2.4
Intercity bus travel	-2.0	-2.2

a. Write in the cell whether the own price demand elasticity for each item is: infinitely inelastic, unit inelastic, inelastic, perfectly inelastic, elastic, unit elastic, or infinitely elastic?

	Short Run	Long Run
Gasoline		
HH Electricity		
Air Travel		
Intercity bus travel		

b. If I wanted to raise revenue by increasing the price of one of these by 10% by imposing a tax, in the long run which good or service will have the largest change in quantity demanded brought about by the imposition of the tax? Which one would have the smallest % change in quantity demanded?

c. Compare the reported elasticities of gasoline and air travel in both the short run and the long run. What is it about the nature of these two commodities that determines the patterns you see in the degree of elasticity?

5) Circle the correct answer

Condition A	Condition B	What type of condition is B for establishing A?
MC is below AC at q	AC is downward sloping at q	N, NS S, NN N,S
The good is homogeneous	The market is perfectly competitive	N, NS S, NN N,S
The market is perfectly competitive	The good is homogeneous	N, NS S, NN N,S
Consumption of the good is characterized by non-rivalry.	The good is a public good	N, NS S, NN N,S
You can get to NYC from Syracuse in less than six hours.	There is a bus to NYC from Syracuse that makes the trip in less than six hours.	N, NS S, NN N,S
The good is an open access good.	The good is characterized by non-exclusion	N, NS S, NN N,S
A quantity is the profit maximizing quantity	The quantity is produced in a technologically efficient way.	N, NS S, NN N,S
The last dollar rule is satisfied at a bundle	MRS=MRT at a bundle	N, NS S, NN N,S

N,NS : Necessary, not sufficient
S, NN: Sufficient, not necessary
N, S: Necessary and sufficient.

6) The price of a gallon of milk has gone down significantly in Central New York over a one year period. Assume each explanation listed below is hypothesized to be the sole cause of this price decrease. Which of the following explanations can you rule out, and which can you not rule out.

Explanation	Rule out Not Rule Out (circle)
Incomes in Central New York have increased since last year.	Rule out Not Rule Out
Consumer preferences have shifted from milk from cattle to soy milk as a result of an ad campaign.	Rule out Not Rule Out
The price of animal feed has decreased over the past year as part of the global recovery from the commodity price spike of 2008	Rule out Not Rule Out
New packaging regulations require use of higher cost biodegradable milk containers.	Rule out Not Rule Out
A disease killed off 15% of the milking herd over the past year.	Rule out Not Rule Out
A new milking machine was developed that allows for significantly lower electricity use per gallon milked thus reducing production costs.	Rule out Not Rule Out

7) Production function.

a) Draw the production function Q=f($L, \overline{K}$) noting areas that are not feasible, not efficient and at the frontier of technological efficiency.

b) Show what technological progress looks like on a production function such as you drew for (a)

c) Demonstrate what neutral technological progress looks like on a isoquant of the function Q=f(L, K)

8) Public goods, voting, and benefit cost.

Syracuse is trying to decide what to do with the inner harbor. They have undertaken some development to improve the park area around the inner harbor, but have decided they need to have a focal point to the park to draw people in. There are five families left living in the city of Syracuse (times have been hard) who will vote on the improvements. They are confronted with three proposals:

Proposal A: Buy and install a modern art sculpture entitled 'cinder blocks resting in a pile' that will cost $3000 ($600 each family).

Proposal B: Build a 'crow house' where people will be able to visit the crows in a natural environment and enjoy their sights, sounds, and smells. Total cost is $10,000 ($2,000 each).

Proposal C: Build and install a Destiny USA lookout tower, where people can climb up and watch the hustle and bustle of an active building site. Total cost of $20,000 ($4,000 each).

This table records each household's WTP for each proposal.

	Proposal A	Proposal B	Proposal C
Miller	$800	$2,300	$2,500
Baker	$250	$3,500	$4,500
Cooper	$150	$1,800	$1,500
Smith	$1,400	$1,900	$4,600
Taylor	$500	$500	$5,500

a) Each household gets one yes-no vote on each project. How will they vote? (circle)

	Proposal A		Proposal B		Proposal C	
Miller	Yes	No	Yes	No	Yes	No
Baker	Yes	No	Yes	No	Yes	No
Cooper	Yes	No	Yes	No	Yes	No
Smith	Yes	No	Yes	No	Yes	No
Taylor	Yes	No	Yes	No	Yes	No

b) If the costs are present value costs, and the willingness to pay figures are present value benefits, what is the net present value of each proposal?

Proposal A	Proposal B	Proposal C

c) Did voting lead us to select the proposal that had the highest net present value? Explain why or why not.

9) Cost.

a. Complete the following table.

Total Output	Fixed Cost	Total Cost	Variable Cost	Average Variable Cost	Average Fixed Cost	Average Cost	Marginal Cost
0	5		-------	------	-----	------	---------
1		25					
2		38					
3		52					
4		67					
5							20

b. Is this short run or long run cost information? Why?

c. If market price for the output produced is 15, what level of output is profit maximizing for a firm if the market structure is perfectly competitive?

10) Public goods. There are three people who live in a town. They are trying to decide the number of days the ice skating rink in the center of town should stay open this winter. Charlie Brown really likes skating and has a marginal willingness to pay curve defined by 120-2*q, where q is measured in days the rink is open. Linus also likes skating, and has a marginal willingness to pay curve defined by 65-q. Lucy does not like the cold very much and has a marginal willingness to pay curve of 25-5*q.

a. Draw these individual demand curves and the societal demand curve for this public good.

b. If the marginal cost of having the rink open is constant at $104 per day and no effort is made to avoid the free rider problem, how many days will the rink be open and who will be paying for it?

c. How many days would it be open at a cost of $104 per day in the socially optimal outcome?

11) The demand curve is given to you as q=14-2*p.

a. Fill out the following table (use the relatively higher price / relatively lower quantity pair for the denominator in 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.

12) Tax policy.

a. Illustrate on a supply and demand graph a specific tax of size τ placed on consumers.

b. Illustrate on a supply and demand graph a specific tax of size τ placed on producers.

c. Illustrate on a supply and demand graph the impact of an ad valorem tax rate of α placed on consumers.

13) Ethiopia is currently considering putting in place a disease free zone where animals can be held and observed for six weeks. Animals held for this length of time in the zone are eligible to be exported to Saudi Arabia. If an animal does not go through this process, it is not allowed to be exported internationally and is sold domestically. The value of an animal in Saudi Arabia is twice what it is worth in Ethiopian markets – that is a bull that sells for $150 USD in Ethiopia is worth $300 if exported to Saudi Arabia. It will cost us 20 million USD in t=0 to build the disease free zone. During year zero, animals will be marketed domestically so domestic revenue and costs will apply. In years t=1, t=2, and t=3 it will cost us 5 million per year to provide veterinary goods and services to establish the disease free zone and 10 million per year to buy feed for animals held in the zone and animals will be marketed in Saudi Arabia. Production for the domestic market currently has 2 million per year spent on veterinary goods and the implicit cost of feeds consumed by domestically marketed animals is estimated to be 5 million per year. Revenue per year of selling animals domestically is 15 million. The same animals sold in Saudi Arabia are worth 30 million. The discount rate is 10%.

What is the net present value of producing for the domestic market?

	Benefits	Costs
T=0		
T=1		
T=2		
T=3		
NPV		

What is the net present value of building the disease free zone and selling in Saudi Arabia?

	Benefits	Costs
T=0		
T=1		
T=2		
T=3		
NPV		

Which is preferable in NPV terms?

Discuss how this demonstrates the difference between “before and after” and “with and without” in benefit cost analysis.

14) Game Theory.

In Syracuse, each resident is responsible for shoveling the snow in front of their house within 24 hours after a storm. Timmy and Tommy are two neighbors who find themselves in the following situation. Each has to cross their own and their neighbor's sidewalk to get to a bus stop to go to work in the morning (different bus stops). If they shovel, it takes them 3 minutes to shovel in front of their house. It takes 30 seconds to walk across a shoveled sidewalk, 2 minutes and 30 seconds to walk across an unshoveled sidewalk. If both shovel, they each spend 3 minutes shoveling and 30 seconds crossing each of two sidewalks for a total of 4 minutes. If your neighbor shovels and you don't, your neighbor spends 3 minutes shoveling, 30 seconds crossing their own sidewalk, and 2 minutes and 30 seconds crossing yours for a total of 6 minutes. You in contrast spend 3 minutes, 30 seconds crossing theirs and 2 minutes and 30 seconds crossing your own. If neither shovels, it takes 5 minutes to get to the bus stop for each (2:30 crossing each of two unshovelled sidewalks).

		Tommy	
		Shovel	Don't Shovel
Timmy	Shovel	4 4	6 3
	Don't Shovel	3 6	5 5

a) What is the full set of best response strategies in this game?

b) What is the Nash Equilibrium outcome of this game?

c) Is there a Pareto improving outcome to this game compared to the Nash Equilibrium? If so, in what sense is it Pareto improving? If not, why not?

15) The inverse demand curve is given as p=80-10*q. The inverse supply curve is given as p=5+5*q.

a) What is the price-quantity equilibrium pair if the market is perfectly competitive?

b) What is the price-quantity equilibrium pair if the market is supplied by a monopolist?

c) Draw these two outcomes on a single graph.

d) Calculate the following areas:

	Consumer Surplus	Producer Surplus	Total Social Welfare
Perfect Competition			
Monopoly			

Work Page