

Final  
PPA 897, Spring 2011  
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  $\tau$  placed on producers. 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  $\rho$  given to consumers. Note the price paid by consumers, the size of the subsidy per unit, the equilibrium quantity, and contrast this to the pre-subsidy price quantity pair.

- c. Show the impact of an ad valorem tax rate  $\alpha$  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. Explain the concept of incidence in reference to your answer to part c of this question.

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. What is a natural monopoly?

- c. Illustrate how a price ceiling can be used as a policy response to regulate a monopoly that is not a natural monopoly.

3) Public goods, voting, and benefit cost.

Jordan Elbridge High School is trying to decide what physical plant improvements to make to the High School Property. There are five families in the school district who will vote on the improvements. They are confronted with three proposals:

Proposal A: Replace wastewater treatment plant, connect to municipal sewage system, and replace and improve drainage system. Total cost is \$3,000 (\$600 each).

Proposal B: All of what is in proposal A plus a new artificial turf playing field surrounded by an all season track. Total cost is \$10,000 (\$2,000 each).

Proposal C: All of what is in proposal B plus heated locker rooms and stadium rest rooms. Total cost is \$20,000 (\$4,000 each)

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

	Proposal A	Proposal B	Proposal C
Taylor	\$800	\$1,800	\$3,500
Feeney	\$200	\$3,500	\$3,500
Badger	\$200	\$1,800	\$9,500
Bennett	\$900	\$1,900	\$3,000
McPeak	\$700	\$1,500	\$3,500

- a) Each household gets one yes vote to allocate across the three proposals. If they have WTP greater than cost for more than one proposal, they will give their yes vote to the proposal that has the greater difference between WTP and cost to that household. How will they vote? (circle)

	Proposal A		Proposal B		Proposal C	
Taylor	Yes	No	Yes	No	Yes	No
Feeney	Yes	No	Yes	No	Yes	No
Badger	Yes	No	Yes	No	Yes	No
Bennett	Yes	No	Yes	No	Yes	No
McPeak	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.

4) The demand curve is given to you as  $q=200-20*p$ .

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.

5) Circle the correct answer.

Statement	The statement is (circle the correct answer)	
Nominal values are expressed in inflation adjusted units.	True	False
Producer surplus is calculated as the area below the demand curve and above the price line.	True	False
With regard to income inequality, the higher the Gini coefficient the higher the degree of inequality.	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 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
A monopolist is a single supplier of a good for which there is no close substitute.	True	False
An open access good is excludable and non-rival.	True	False
The free rider problem leads to under-provision of a public good.	True	False
The commitment problem explains why commitments made <i>ex ante</i> may not be credible <i>ex post</i> .	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  $p_f$ .

7) Briefly describe first how each of the following can justify government policy response, and then identify a potential policy response that addresses the problem.

a. Information asymmetry in the used car market.

b. The moral hazard problem in selling people fire insurance.

c. The positive externality conferred on neighboring properties when an individual homeowner improves a property.

d. The negative externality imposed on society by a private firm emitting particulate matter as a by-product of production.

8) Benefit cost.

We are worried that climate change will negatively impact yields of rice in the Gambia. Over the next three years ( $t=0, t=1, t=2$ ), we could invest in research that is aimed at developing new varieties that will be as productive as current varieties after climate change leads to a 2.5 Celsius increase in mean temperature in the Gambia starting in  $t=3$ . Without the development of new varieties, this predicted increase in temperature will lead to a reduction in the rice sector's contribution to GNP. The present value net benefits of the "with investment to develop new varieties to maintain current yield levels" over the "without investment to develop new varieties so we have declining yields" has been estimated to be 124 million current USD.

a) Draw the net benefit stream over time with time on the x-axis and net benefits on the y-axis for the "with" and "without" scenarios, being sure to contrast "with" and "without" with "before" and "after".

b) If it will cost us 100 million this year ( $t=0$ ), 15 million next year ( $t=1$ ), and 11 million the year after that ( $t=2$ ) for the research in the "with" scenario and the discount rate is 10%, does a benefit cost test tell us we should or should not invest in the research to develop new varieties?

c. Do we reach the same conclusion about whether this is a project we should undertake or not if the discount rate is 5% instead of 10%?

9) Voting on the funding for the Syracuse City School District. Syracuse faces a substantial decline in state funds due to the economic crisis. It is voting on how many teachers to cut. It can issue bonds to earn some money to fill the funding gap. We are voting on the budget and bond strategy. Our options are:

- Low Budget, No bonds – low cost budget, 700 teacher jobs lost
- Medium Budget, Low Bonds – medium cost budget, 250 jobs lost
- High Budget, High Bonds– highest budget, no teacher jobs lost

Four groups in society:

- Moderates, who prefer Medium, to High, to Low (30%)
- Fiscal Conservatives, who prefer Low, then Medium, then High (35%)
- People with kids enrolled in the city schools, who prefer High, to Low, to Medium (30%)
- Teachers, who prefer High, to Medium, to Low (5%)

Preferences over Budget Levels				
	First Choice	Second Choice	Third Choice	Percent of the vote
Moderates	Medium	High	Low	30%
Fiscal Conservatives	Low	Medium	High	35%
Effective Schoolers	High	Low	Medium	30%
Teachers	High	Medium	Low	5%

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

**a. Agenda A: Compare High to Low, then winner takes on Medium**

**b. Agenda B: Compare Medium versus Low, winner takes on High**

**c. Agenda C: Compare High versus Medium, winner takes on Low**

d. Describe how this illustrates the power of agenda setting in a democracy.

10) Public Goods. The public good we are considering is free summer concerts in Onondaga Lake Park. There are three people who live in our society. Ferb has a willingness to pay for concerts defined by  $WTP=300-10*q$ . Candice has a willingness to pay for concerts defined by  $WTP=500-20*q$ . Phineas has a willingness to pay for concerts defined by  $WTP=900-50*q$ . In this problem, each unit of  $q$  is a concert event.

a. If it costs 500 to supply a concert event and no effort is made to resolve the free rider problem, who will provide the concert events and how many concert events will be held?

b. What is the socially optimal number of concert events to hold if the cost is 500 per event?

c. Describe why public good provision is different from private good provision using the characteristics of rivalry and excludability.

Work Page: