Final Name: _____
PPA 723, Fall 2002
Professor John McPeak
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The total final is worth 30 points. Each question is worth 2 points, and each sub question is worth an equal share of the two points.

1) For each of the following names corresponding to a slope, provide the technical name of the curve or line from which this slope is derived.

a) Slope name	Curve or line name
Absolute value of the marginal rate of technical substitution	
Marginal rate of substitution	
Marginal rate of transformation	
Negative of the ratio of input prices	

b) Which two of these concepts are used to identify the optimal bundle in consumer theory?

c) Draw a graph, illustrating how these curves and slopes are used in identifying an optimal bundle. LABEL ALL POINTS, CURVES, AND AXES.

d) Which two of these concepts are used to identify points of economic efficiency in producer theory?

e) Draw a graph, illustrating how these curves and slopes are used in identifying an economically efficient point. LABEL ALL POINTS, CURVES, AND AXES.

2) Describe how the following events would influence the demand curve for processed pork in the US. Note specifically whether the outcome involves a shift in the demand curve or a movement along the demand curve. Describe the economic reasoning behind your answer in a sentence using the correct technical terms when appropriate. Draw a graph to illustrate your answer, and LABEL ALL POINTS, CURVES ANDAXES.
    a. The price of processed chicken increases by 10%.

    b. The price of animals used to make processed pork decreases by 12%.

    c. A study is presented at a major medical conference linking processed pork consumption to decreased risk of stomach ulcers.

3) Assume the rental rate of capital is $5 and the wage rate is $10.

a. Draw an isocost curve for the cost level of $200 (put capital on the y axis, labor on the x axis).

b. What is the slope of the isoquant at the point of economic efficiency for the cost level of $200?

c. If you know the marginal product of capital at the point of economic efficiency is 10, what is the marginal product of labor at this point?

d. If you find the points of economic efficiency for the costs of $100 and $150, and draw a line connecting these points to the point of economic efficiency for a cost level of $200, what is the technical name of the resulting line?

4) Complete the following table.

a) Quantity of Output	Fixed Cost	Total Cost	Average Cost	Marginal Cost	Variable Cost
0	10	10	----------	---------	----------
1		22			
2		31			
3		43			
4			14		
5		70			
6				15	
7		102			
8					120

b. If the market price for the output produced is 12, what level of output is the profit maximizing level of output? [Note – you should find two points meeting the condition you are used to using to solve such problems. Decide between zero output, the first of these points, and the second of these points using the reasoning behind the shut down decision]. Explain your answer.

5) If you know that the inverse demand curve is P=24-Q, and the private cost curve is defined by 2*Q (so that both average cost and marginal cost are equal to 2), answer the following questions.
    a. What is the profit maximizing level of output for a monopoly firm in this market, and what is the price of the good at this level of output?

    b. What is the profit maximizing level of output and equilibrium price if the market structure is competitive?

    c. Provide on a single graph an illustration of these two cases. AGAIN, LABEL EVERYTHING (and keep doing so as you go on from here).

    d. Calculate the area of the deadweight loss of monopoly market structure compared to a perfectly competitive market in this case.

6) Continue with the information presented in problem 5. However, now assume there is a negative externality of production defined by Total Externality =6*Q (so that the marginal cost of the externality is equal to 6 for each unit produced).
    a. What is the socially optimal level of output and corresponding market price if the market structure is competitive?

    b. Calculate consumer surplus, producer surplus, tax revenue, and the welfare loss implied by the Total Externality for the three different cases: the solution to the monopoly case (5a), the solution to the perfectly competitive case (5b), and the socially optimal solution (6a). Assume that the socially optimal case is arrived at through a Pigovian tax charged to producers. Calculate the total welfare for each case.

	Monopoly Case	Competitive Case	Socially Optimal
Consumer Surplus			
Producer Surplus			
Tax Revenue	0	0	
Total Externality			
Total Welfare			

7) The demand curve is given to you as Q=10-5*P.
    a. Fill out the following table (use the relatively higher price / relatively lower quantity pair in the elasticity calculation).

Price	Quantity	Elasticity
$0.00		----
$0.50		
$1.00		
$1.50		
$2.00		

    b. Draw this demand curve with price on the y axis and quantity on the x axis. Identify on this graph the range over which the demand curve is inelastic, and over which it is elastic. Identify the unit elastic point.

8) Consumers purchased 400,000 SU Orangemen winter caps this year when the price of Orangemen hats is $10. Last year, the price of Orangemen hats was $15 and the amount sold was 500,000.
    a. Four theories are advanced. One, the disappointing performance of the SU football team has decreased the demand for SU hats. Two, winter this year started earlier and is already colder than last year's winter, thus increasing the demand for hats. Three, the price of orange dye increased, increasing the cost of producing Orangemen hats. Finally, the hat company opened a new plant this year in Honduras, where the costs of producing hats are less than the cost of producing them in the Oswego plant used last year. Which theory is most consistent with the facts, and why would you be skeptical of the other three theories?

    b. What kind of elasticity can you calculate based on this information?

    c. What is the value of the calculated elasticity (use last year's values for the denominators in the percent calculation) and is this elastic or inelastic?

9) Say there is a community owned plot of land. We are deciding whether to put a lacrosse stadium (lacrosse is a game played around here) or a set of rose beds on the plot of land. Three families live in this community, and will share the costs of the project selected equally. They are meeting to vote on the project tomorrow morning. Assume a discount rate of 6% is applicable in this case and that the project time horizon is three years (construction year, use year 1, use year 2).

   a. If the cost of building the lacrosse stadium is $15,000 right now, and the annual upkeep costs next year and the year after are estimated to be $1,000 per year, what is the net present value of costs for the lacrosse stadium project?

   b. If the cost of building the rose beds is $20,000 right now, and the annual upkeep costs next year and the year after are estimated to be $500 per year, what is the net present value of costs for the rose bed project?

10) Continue the example from problem 9. Assume you know that the three households have **net present value benefits** represented by the marginal willingness to pay figures described in the following table.

	Household A	Household B	Household C
Lacrosse Stadium	4000	8000	6000
Rose Beds	13000	3000	5000

   a. Which project maximizes net present value of benefits – net present value of costs, the Lacrosse Stadium or the Rose Bed project? Show how you arrived at this conclusion.

   b. Which project will pass in the vote tomorrow? Show how each household will vote for each project, and explain why they will vote this way.

11) Provide the formula for calculating the following, and answer all follow up questions.
    a. Define a supply elasticity.

    b. Define an own-price demand elasticity.

    c. Define a cross price demand elasticity.

        i. Is this positive or negative if the two goods in question are complements?

    d. Define an income elasticity of demand.

        i. Is this positive or negative for an inferior good?

12) The US government is trying to decide at what level to place a price floor on the producer price of processed pork. Currently, farmers receive $1.50 per pound of processed pork, and 500,000 pounds are sold per day.

    a. If the price floor is set at $2.00 per pound, show on a graph what will happen to the equilibrium price – quantity pair.

    b. If the price floor is set at $1.00 per pound, show on a graph what will happen to the equilibrium price-quantity pair.

    c. Identify which price level leads to excess demand or excess supply, and identify whether it is excess supply or excess demand.

13) Dunkin Donuts and Crispy Cream both have donut shops in a given shopping district. They are each deciding whether to expand to a larger shop size. Payoffs are in economic profit in dollars per day.

If Dunkin Donuts expands, and Crispy Cream expands, each firm will get 4,100 as a payoff.

If Dunkin Donuts expands, and Crispy Cream does not expand, Dunkin Donuts gets 5,100, while Crispy Cream gets 3,800.

If Crispy Cream expands, and Dunkin Donuts does not expand, Crispy cream gets 5,100, while Dunkin Donuts gets 3,800.

If neither firm expands, they get 4,100 per day as a payoff.

The following table represents the payoffs to the respective firms of building the donut shop conditional upon the other firm's decision.

		Crispy Cream			
		Expand		Don't Expand	
Dunkin Donuts	Expand	4,100	4,100	5,100	3,800
	Don't Expand	3,800	5,100	4,600	4,600

a. Define the **full set** of best response strategies for each firm.

b. What is the outcome of this game if each firm plays their best response strategy?

c. Does the outcome change if Dunkin Donuts is given first mover status? Why or why not?

d. If the firms could credibly agree to collude, what would they do, and does the outcome for the firms improve payoffs to the firms in the Pareto sense from the outcome found in (b)?

14) Assume the price of good 1 is $5 per unit, the price of good 2 is $20 per unit, and the consumer's income is $100.

a. Draw the budget constraint if the consumer's income is $100.

b. If the price of good 1 changes to $10 per unit, illustrate on a graph how this changes the budget constraint.

c. If the consumer's income increases to $200 given the original prices, illustrate on a graph how this changes the budget constraint.

15) Say that you know for a particular consumer and particular consumption bundle the marginal utility of consuming eggnog is 5 and the marginal utility of consuming fruitcake is 10.

a. The ratio of these marginal utilities defines the slope of what curve?

b. If the price of eggnog is 10 and the price of fruitcake is 15, why is the consumption bundle identified above not an optimal bundle?

c. Should we increase eggnog consumption, increase fruitcake consumption, or move into the opportunity set to arrive at the optimal bundle?