

Exam 2
PAI 897, Fall 2018
Professor John McPeak

Name: _____

Exam is 15 Total Points. Each of the 10 numbered questions is worth 1.5 points, sub questions worth an equal share of these 1.5 points.

1) Complete the following table.

Output	Fixed Cost	Total Cost	Variable Cost	Marginal Cost	Average Cost	Average Variable Cost
0	10			NA	NA	NA
1						15
2				14		
3			42			
4				15		
5			74			
6					17	
7				21		
8		148				

- a) Is this a short run or long run information on cost? Why?
- b) If the price of the good produced is currently 17, what level of output meets the profit maximizing condition?
- c) Illustrate how to derive the firm's supply curve using the relevant cost curves in this table.

2) Demand curves.

a. Illustrate how you derive a market demand curve from 2 individual consumers when the demand is for a private good.

b. Illustrate how you derive a societal demand curve from 2 individual consumers when the demand is for a public good.

c. Explain how these differ in terms of the characteristics of a private good in contrast to the characteristics of a public good.

3) 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. What is the difference between a monopoly and a monopsony?

4) Circle the correct answer.

Statement	The statement is (circle the correct answer)	
Real 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
In a perfectly competitive market the firm is a price taker.	True	False
If where price = MC(q), price is less than average fixed cost, the firm should shut down and produce q=0 in the short run.	True	False
Marginal cost = cost of the input / marginal product.	True	False
If the market arrives at a Pareto Optimal outcome it has achieved economic efficiency.	True	False
An open access good is excludable and non-rival.	True	False
The free rider problem leads to over-provision of a public good.	True	False
A necessary but not sufficient condition for economic efficiency is technological efficiency.	True	False

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

a. Draw an isocost curve for a total cost level of 140.

b. If the marginal product of labor is 4, what is the marginal product of capital at an economically efficient point? Why?

c. What is the formula for and numerical value of the slope of the isocost you drew in part a.?

- 6) 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

7) Externalities. The inverse demand curve is given as $p=116-4q$. The inverse supply curve is $p=20+4q$.

- 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 $4*q$ ($MC^E=4*q$), what is the socially optimal price quantity pair?

- c. Define a Pigovian specific tax that can be placed on the inverse supply curve to replicate the socially optimal price quantity pair.

- d. Illustrate in a graph parts a, b, and c.

8) Public goods. There are three people who live in Manhattan. They each have a demand curve for the number of giant balloon figures that will be in the Macy's Thanksgiving Day parade. Q in this case is the number of balloon figures. Jerry has an inverse demand / WTP curve defined by $1000-10*Q$. Elaine's curve is $400-10*Q$. George's curve is $300-30*Q$.



- a. If the marginal cost placing a giant balloon in the parade is \$800 and no effort is made to avoid the free rider problem, what number of giant balloons will be in the parade and who will provide them?

- b. How much less is this than the socially optimal number of balloons?

9) You are given the following information on the relationship between inputs and production level at various points.

Points	Labor	Capital	Output
A	1	3	8
B	2	6	20
C	4	12	41
D	8	24	82
E	16	48	160

a. Illustrate these points using isoquants.

b. Contrast the returns to scale implied by movement between the points. (circle the correct answer)

From A to B I have (increasing, constant, decreasing) returns to scale.

From B to C I have (increasing, constant, decreasing) returns to scale.

From C to D I have (increasing, constant, decreasing) returns to scale.

From D to E I have (increasing, constant, decreasing) returns to scale.

10) Production and cost functions. (2 points)

a. $Q=f(L, \bar{K})$ is the production function. Draw a production function and explain why it exhibits diminishing marginal product.

b. Explain and illustrate the connection between diminishing marginal production in a production function and increasing marginal cost in the cost function.

c. If the cost of the input of labor L is \$6 per unit, calculate the cost of producing each level of output, and the marginal cost for changing the output level.

Input level L	Output level Q	Cost of producing Q	Change in Q	Change in cost	Marginal Cost
0	0	0	NA	NA	NA
1	9				
2	21				
3	32				
4	42				
5	51				
6	59				
7	66				
8	72				
9	77				

Work Page: