Exam 2 Name: _____
PAI 897, Fall 2022
Professor John McPeak

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. Students are allowed to use a calculator and have 1 3 by 5 index card with key formulas on it.

1) Cost
   a) Complete the following table.

Output	Fixed Cost	Total Cost	Variable Cost	Marginal Cost	Average Cost	Average Variable Cost
0	5			NA	NA	NA
1						20
2				18		
3			57			
4					20.5	
5		104				
6			124			
7				28		
8						23.0

   b) Is this a short run or long run information on cost? Why?

   c) If the price of the good produced is currently 18, what level of output meets the profit maximizing condition?

   d) 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) Circle the correct answer.

Statement	**The statement is (circle the correct answer)**
Decreasing returns to scale happen when an input is held fixed in the short run.	True False
Producer surplus is calculated as the area below the demand curve and above the price line.	True False
A higher Gini coefficient indicates a higher degree of inequality.	True False
A Pareto optimal outcome is economically efficient.	True False
If marginal cost is above average fixed cost, then average fixed cost is increasing.	True False
Marginal product equals average product at the maximum of marginal product.	True False
A Nash Equilibrium is where players are playing best-response to each other.	True False
A club good is excludable and non-rival.	True False
An isoquant represents all combinations of inputs that cost the same amount.	True False
A necessary but not sufficient condition for economic efficiency is technological efficiency.	True False

4) Assume the rental rate of capital is 14 and the wage rate is 5.

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

b. If the marginal product of labor is 10, 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.?

5) The faculty of the PAIA department are going on a retreat to discuss the EMPA curriculum. The options for the retreat are: a three day retreat in Minnowbrook in the Adirondacks, a day long retreat at the Lincklaen House in Cazenovia, and a 2 hour afternoon meeting in Maxwell 204. There are three groups in the faculty: those who think the curriculum needs serious revision, those who think the curriculum needs some revision, and those who think the curriculum needs minor revision. Those who think it needs minor revision also like hiking in the Adirondacks. The following table describes the groups in the faculty and their preferences over the retreat options.

Preferences over retreat options				
	First Choice	Second Choice	Third Choice	Percent of the faculty
Need serious revision	Minnowbrook	Lincklaen	Maxwell 204	20%
Needs some revision	Lincklaen	Maxwell 204	Minnowbrook	35%
Needs minor revision	Maxwell 204	Minnowbrook	Lincklaen	45%

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

a. Maxwell 204 versus Lincklaen, then winner takes on Minnowbrook

b. Minnowbrook versus Maxwell 204, winner takes on Lincklaen

c. Lincklaen versus Minnowbrook, winner takes on Maxwell 204

6) Externalities. The inverse demand curve is given as p=108-2q. The inverse supply curve is p=12+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 2*q (MC^E=2*q), what is the socially optimal price quantity pair?

c. Define a Pigouvian 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.

7) You know that demand curve is defined by the following function: p=99-3*q.

a) Use the bisection rule to define the marginal revenue curve

b) If total cost is defined by 9*q, then you know MC is 9 for all possible levels of q. What is the value of Average Cost? Explain.

c) What price-quantity pair will be selected by the monopolist?

8) Continue with p=99-3*q and MC=9.
a) If this market is freed up from a monopoly to a perfectly competitive outcome, what is the price-quantity pair under perfect competition?

b) Draw a graph that illustrates both the monopoly outcome and the perfectly competitive market outcome.

c)Calculate the following areas.

	Monopoly	Perfect Competition
Consumer Surplus		
Producer Surplus		
Dead Weight Loss		
Total Social Welfare		

9) Syracuse University and the City of Syracuse are considering options to deal with the parking issue around campus. SU is considering expanding the Irving Garage. City of Syracuse is considering expanding the Madison-Irving Garage. Currently, City of Syracuse is earning $9,200 profit per day and SU is earning $8,400 profit per day. The following table sets out the profit per day to each if the following decisions are made

	Syracuse University				
City of Syracuse		Expand		Don't Expand	
	Expand	8,100	7,100	10,500	6,600
	Don't Expand	7,500	10,000	9,200	8,400

a) Describe the full set of best response strategies for each player.

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

c) Does the Nash Equilibrium outcome Pareto Improve on the current situation? Explain why or why not.

10) 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 next week. q in this case is the number of balloon figures. Phoebe has an inverse demand / WTP curve defined by 900-30*q. Chandler's curve is 500-10*q. Monica's curve is 400-10*q.

a. If the marginal cost placing a giant balloon in the parade is $600 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?

Work Page: