Name _____

Sign the pledge:

No Aid; No Violations _____

Mike Lovell

December 19, 2001

PAC 125

Econ 201/(301?): Final Examination (c)

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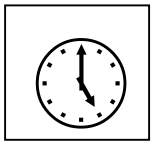
Please Note:



- The exam will end at 5:00! Budget your time carefully
- Save time to read over your answers and make corrections at the end of the test.
- Start your answers in the space provided, but continue if necessary on the back of the page or on a separate sheet of paper. Extra sheets are available in the front of the room.
- Show your calculations in order that you may receive partial credit even if you make a numerical error.
- If you would like me to mail your exam to your home, leave a stamped addressed envelope in the slot for this course in the Economics/Sociology Alcove. Otherwise, your work will be returned to the alphabetical slots in the Alcove to be picked up at the start of classes for the second semester.
- If you want additional feedback on any aspect of your work, please contact me at your convenience for an appointment early in the next semester.

Exam Protocol:

- Sign the Pledge; observe the Honor Code. Ask the instructor if you have any questions
- Step out of the room when you please, but leave your exam at your desk.
- When you have finished the exam, check it over carefully. Then place your examination in the envelope on the table in the front of the room and leave quietly.

PART 1: IDENTIFICATION (40 points ~ 4 each):

Here is a list of 10 definitions or equations followed by the names of 15 key concepts. Please place in front of each definition the letter corresponding to the most appropriate key concept.

Definition or equation:

____ 1. Driving faster in snow because your SUV has 4 wheel drive
____ 2. $d\partial X_2/d\partial p_2 = \partial X_2/\partial p|_U + - X_2\partial X_2/\partial M$
____ 3. $\{p[q(L,K)] + q(L,K)\ dp/dq\}\partial q/\partial L$
____ 4. exploitation
____ 5. $\partial X_2/\partial p|_U$
____ 6 $w(L) + L\ dw/dL$
____ 7 $p(1-1/\eta)$
____ 8. $- X_2\partial X_2/\partial M$
____ 9. Selling the same good at different prices in different markets
___ 10. $-\frac{dq}{dp}\frac{p}{q}$

Key concept

a.	Certainty equivalence	g.	Slutzky equation
b.	Substitution effect	h.	Risk premium
c.	Income effect	i.	Marginal revenue
d.	Marginal labor cost	j.	Price discrimination
e.	Marginal revenue product of labor	k.	Moral hazard
		l.	Adverse selection
f.	Price elasticity of demand (η)	m.	$w < p\partial q/\partial L$

PART 2: Please answer five (only 5) of the following seven questions in the space provided (including page 7 and the back of the preceding page. [60points ~ 12 each]

2.1 Alfred Marshall believed in the Law of Demand – $\partial q/\partial p < 0$. But Giffen claimed to have observed that the demand for potatoes in Ireland increased when the price increased. Carefully draw an indifference map showing that a utility maximizing consumer might consume more of a commodity at a higher price.

2.2 A consumer behaves *as if* she were maximizing the following Lagrangian expression:

$$L(M,X_1,X_2,\lambda) = X_1 - (X_2+1)^{-1} - \lambda(p_1X_1+p_2X_2 - M)$$

Here X_1 and X_2 are the quantities consumed of two goods, p_1 and p_2 are their prices, M is income, and λ is the Lagrangian multiplier.

a. What is our consumer's utility function.

b. What is the marginal utility of X_1? What is the marginal utility of X_2.

c. Derive demand functions $X_1(p_1,p_2,M)$ and $X_2(p_1,p_2,M)$ (You may use either the method of Lagrange or the method of substitution).

2.3 A monopoly faces demand function $q(p) = 100 - 10p$.
It has total cost function $C(q) = 30 + 2q + q^2/2$.

a. Determine the inverse demand function p(q)

b. Determine the total revenue function $R(q) = qp(q)$.

c. Determine marginal revenue.

d. Solve for the level of output that will maximize profits in the short run.

e. What is the elasticity of demand at this level of output?

f. What level of output will maximize profits in the long run?

2.4 The annual net reproduction rate of fish in the Wesleyan Sea is

$$R(F_{t-1}) = (2- F_{t-1})(F_{t-1} - 100,000)/4,000,000 = -.05 + 0.025F_{t-1} – 0.00000025F_{t-1}^2$$

where F_{t-1} is the stock of fish in the sea inherited from the preceding year..

a. How many fish will there be in the sea, in stable equilibrium, assuming there are no fisherman? (State of Nature)? Explain

b. The fisherman arrive and take 250 fish out of the sea each year. Approximately how many fish will there be in the sea in the new equilibrium?

c. What is the maximum sustainable catch?

d. Suppose that the development of radar detectors empowers the fisherman to catch 1,000 fish each year. What will happen to the stock of fish in the long run as a result of this wonderful invention?

e. Is the outcome you predicted in dc desirable? If so, why? If not, what measures would you recommend to prevent the undesirable outcome? Explain.

2.5. The demand function by the citizens of Dogpatch for physician visits is $q = 1{,}600 - 8p$, where p is the charge per visit. The citizens wish they had a physician, but no physician will come to Dogpatch unless the town guarantees an annual income of $100,000 plus $10 per patient visit. Hint: Draw a graph

a. A fee per visit of $_____ will maximize the income of a physician practicing in Dogpatch. It will yield total revenue of $_____.

b. How much consumer surplus would be generated if physician visits were sold at the revenue-maximizing price?

c. Would you recommend that the town use tax revenue to attract a physician? Why or why not? And if a physician does come, what fee per visit would you recommend? Explain.

2.6 Two firms produce differentiated products with demand functions

$$Q_1 = 200 - 2p_1 + p_2$$
$$Q_2 = 200 + p_1 - 2p_2$$

There cost functions are $C_1(q_1) = 20q_1$ and $C_2(q_2) = 20q_2$.

Suppose that each firm assumes that, regardless of what it does, the other firm will not change its price. Determine the equilibrium prices, quantities and profits for the two firms.

2.7 Two duopolists are each trying to decide whether to price low or price high. Here is their payoff (profit) matrix:

Duopoly pricing payoff matrix

	Firm #2 prices high	*Firm #2 prices low*
Firm #1 prices high	$4513 ,*$4513*	$3008, *$5077*
Firm #1 prices low	$5077, *$3008*	$4011, *$4011*

a. Does Firm #1 have a dominant strategy? Explain.

b. Is there a Nash equilibrium? Explain.

c. Firm #1 decides to sell some of its productive capacity. This will not affect its costs at the low levels of output that would prevail if it prices high. But if it prices low, it will have to pay overtime wages to its workers, which will mean that is profits when pricing low will only be either $4,200 or $2,800, depending on the pricing strategy of Firm #2. Is this a wise move? Explain.

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HONORS OPTION (Answer on the back of this page or on a separate sheet of paper.)

Warning: You will not receive any credit for this question unless you answer it correctly. No partial credit.

The ith firm sells its product in a monopolistic-competitive industry.
Its total costs are $C_i = 50q_i + 500$, where q_i is output.
The demand function for the output of the ith firm is $q_i = 100000p^{-2}\bar{p}^{1/2}n^{-1/2}$,
where $\bar{p}$ is the average price charged by all the other firms in the industry and n is the number of firms in the industry.

1. Initially there are 25 firms in the industry. Determine the value of p, q_i, $\bar{p}$ and profits π that will prevail in short-run equilibrium,
2. Assuming that there is free entry and exit from the industry and all firms have identical demand and cost functions, determine the long run competitive equilibrium values of p, $\bar{p}$, n and profits π that will prevail in long run equilibrium.
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ENJOY YOUR VACATION – You have earned it!

Room for additional answers and computations here