ECO 461
Fall 2016
Midterm Exam

Name: _____KEY_____

Answer each question in the space provided. 100 points total.

1. (5 pts.) From "Corn's Rally Sends Ripples" (*WSJ* 2007), use supply and demand analysis (in words, without a diagram) to briefly explain the ripple effects of what was happening in the corn market on a market for one of the goods related to corn that was mentioned in the article.

Ketchup

farm equipment

soybeans

2. (5 pts.) Alchien and Demsetz's theory of the firm involves team production. Shirking is a problem whenever team production methods are used. A&D suggested that a monitor can be appointed to monitor employees and keep shirking under control. In A&D's notion of the classic capitalistic firm, how can we be sure that the monitor will not shirk?

the owner of the firm
is the residual claimant.

3. (5 pts.) Explain briefly how the cork monopoly was popped.

plastic corks!

4. (5 pts.) What market is Bombardier trying to enter and who are its rivals in that market?

medium-sized passenger jets.
Boeing and Airbus.

5. (20 pts.) Labor and capital are used to produce widgets according to the production table below:

		Labor Input				
		1	2	3	4	5
Capital Input	1	20	40	55	65	75
	2	40	60	75	85	90
	3	55	75	90	100	105
	4	65	85	100	110	115
	5	75	90	105	115	120

a) While you do not have enough information to locate more than one or just a few points on each isoquant, sketch this firm's isoquant map. Sketch and label the isoquants corresponding to outputs of 20, 40, 60, 75, 90, 110, and 120.
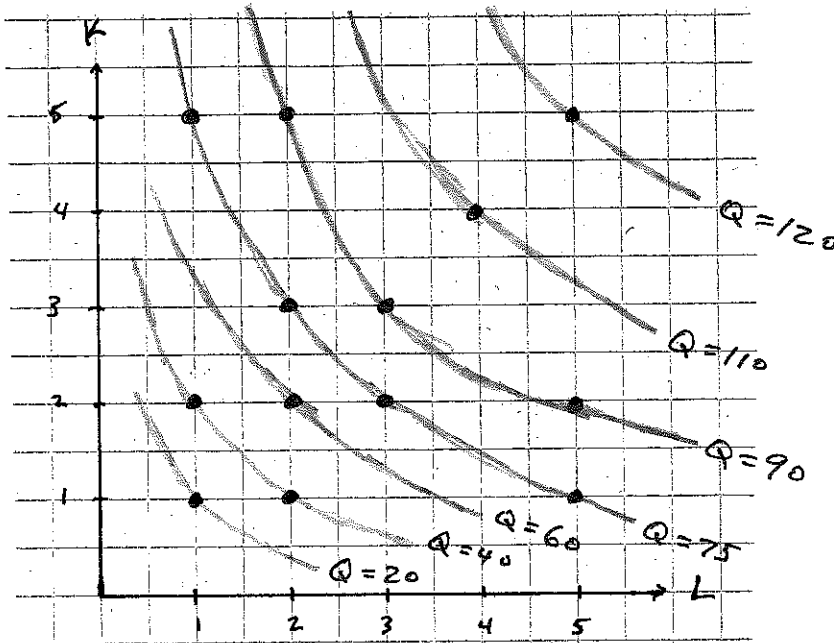
Points on isoquants taken from above chart.

b) Suppose that the firm's expansion path is the 45-degree line when w=$10 and r=$10. In other words, it minimizes cost by using labor and capital in equal proportions when input prices are equal. Draw the firm's LRAC curve in the attached diagram. (Hint: TC=wL+rK).
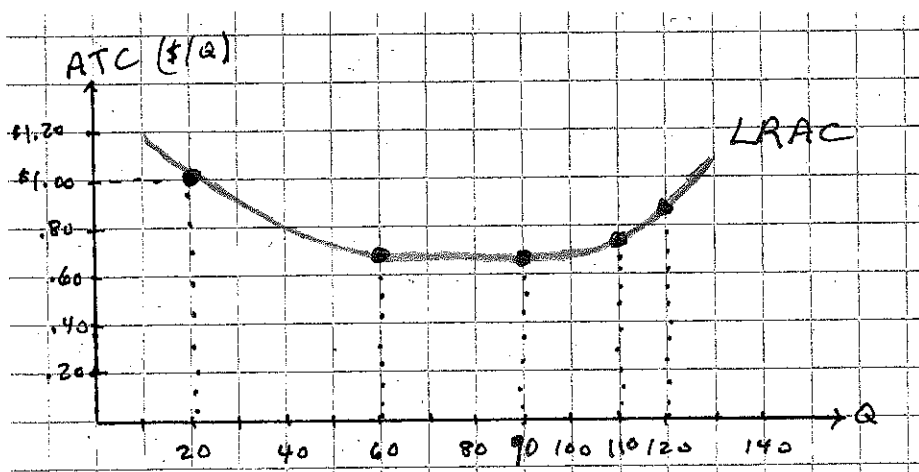
L	K	Q	TC	ATC
1	1	20	20	1.00
2	2	60	40	.67
3	3	90	60	.67
4	4	110	80	.73
5	5	120	100	.83

6. (20 pts.) In 1993 the market price of a four-foot alligator was $120. Approximately 350,000 four-foot alligators were bought and sold at that price. Minimum efficient scale for a typical alligator farmer is 3000 alligators per year. At that scale of operation, average total cost equals $150.

a) Illustrate and briefly explain these supply and demand conditions in the market diagram below. Then illustrate the ATC, MC, and demand curves for a typical alligator farmer facing the 1993 market conditions. Show the firm's profit-maximizing output and its profits (or losses) in your diagram. Label these (a).
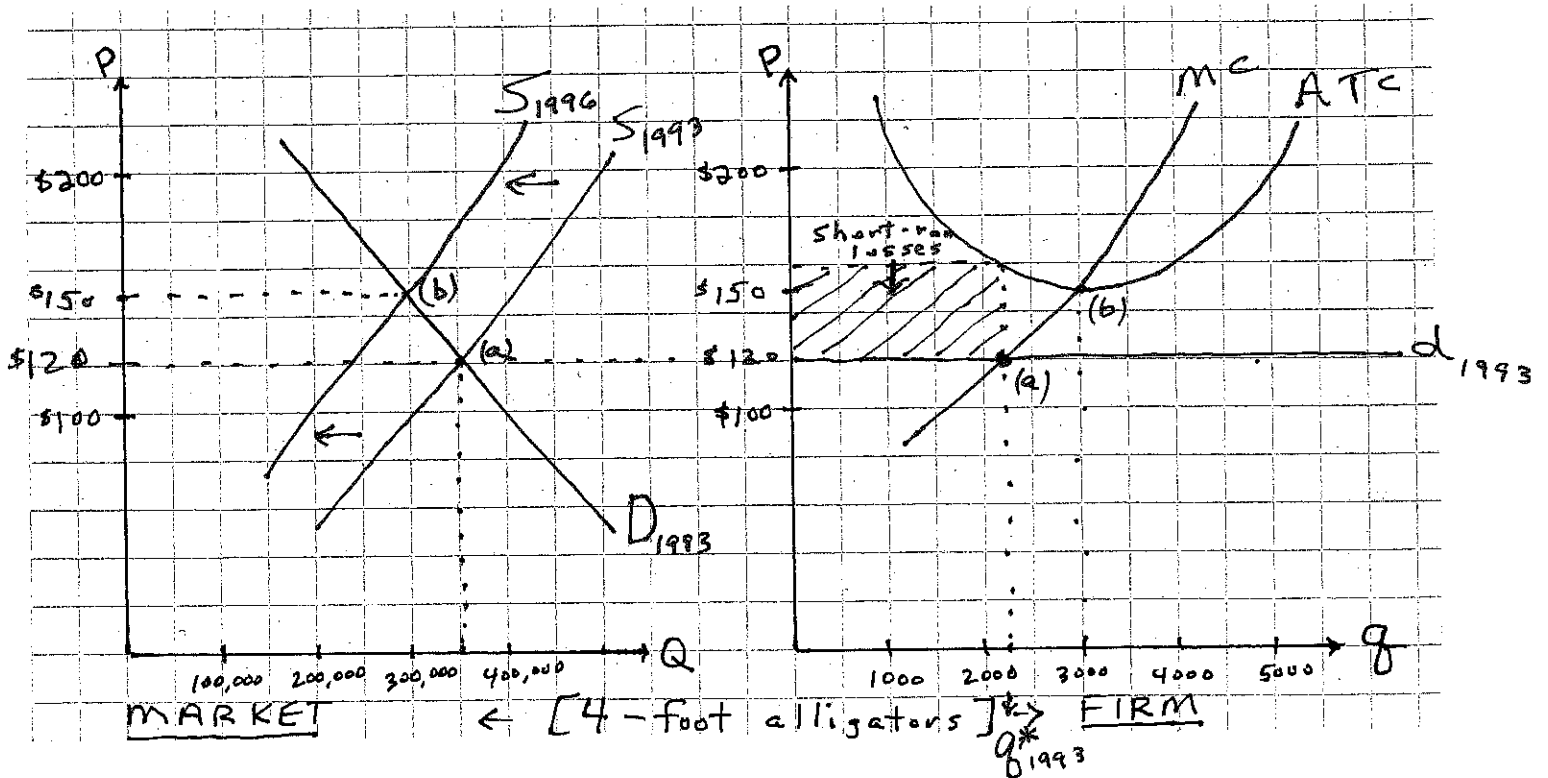

b) Now imagine that you were asked in 1993 to predict the future of the industry. Given the 1993 market conditions, what do you think was likely to happen in the alligator market going forward? Your answer should contain references to short-run and long-run profits, the number of firms, and market price and output. Illustrate in your diagram above and label (b).

Farmers are currently suffering short-term losses when the market price is $120, as indicated by the shaded area in the firm's diagram above. With the passage of time, some alligator farmers will decide to leave the industry. Their exit will cause the market supply curve to shift to the left, and the price of alligators will rise. As price rises the equilibrium quantity of alligators bought and sold will decline. Eventually we predict that price will rise to $150, at which point those alligator farmers who stuck it out will be able to earn a normal economic return, i.e. zero economic profits. There will be fewer alligator farmers, market price will be higher, and market output will be lower than in 1993.

7. (20 pts.) Suppose that the mayor's sister is granted a monopoly charter by the Lexington city council to operate a Frisbee golf course. She can produce any level of output that she wishes at a constant marginal cost of $5 per unit. Since she owns the only Frisbee golf course in town, anyone who wants to play must patronize her course. Assume that all Frisbee golfers are alike, and each one has an annual demand for playing that is given by Q=70-2P, where Q refers to the number of rounds played per year and P refers to price. Graph this demand curve below.

a) What are the monopoly's profit-maximizing price and output? How much profit would she make off of each golfer in a year? A graph-based answer is sufficient. Illustrate in the attached diagram.

(15 pts)
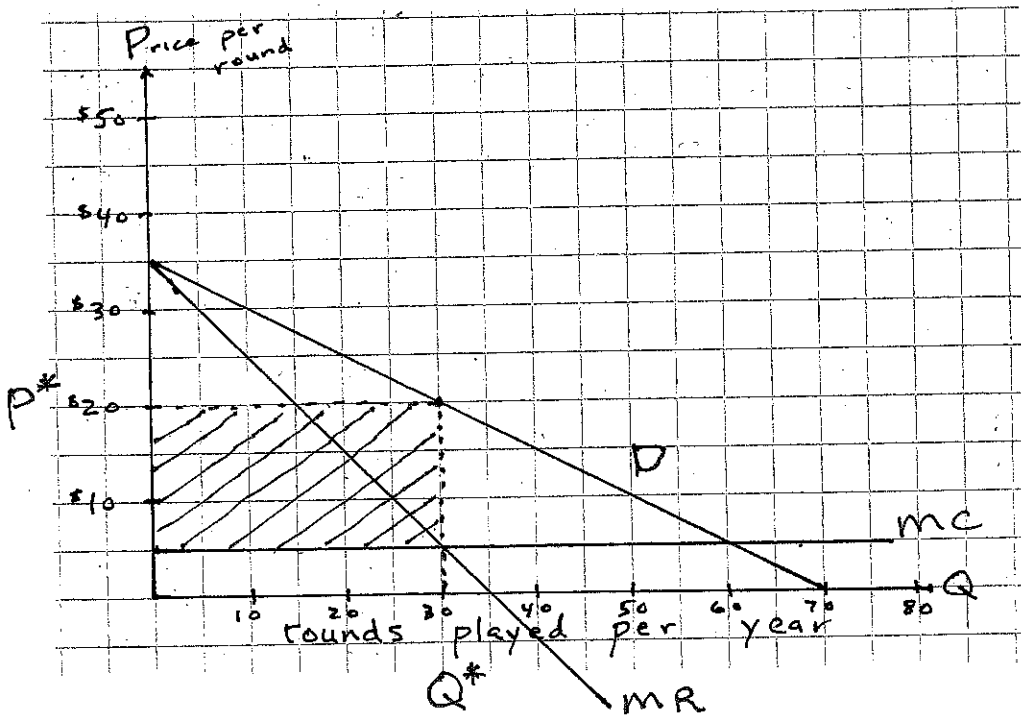
Profit Max:

$MR = mc$ at $Q^* = 30$

$P^* = \$20$

Profit = ⬛

$\pi = \$15 \times 30 = \$450$

b) Using the inverse elasticity pricing rule, calculate own-price elasticity of demand at the point on the demand curve where profits are maximized. Show your formula and work.

(5 pts.)

$$IER \Rightarrow \frac{P - mc}{P} = \frac{1}{\varepsilon}$$

$$\frac{20 - 5}{20} = \frac{1}{\varepsilon}$$

$$\frac{3}{4} = \frac{1}{\varepsilon}$$

$$\varepsilon = \frac{4}{3} = 1.33$$

8. (20 pts.) Ralph and Colleen play a game. Sometimes they both select their strategy at the same time; sometimes Ralph chooses his strategy first and Colleen chooses her strategy after she sees what Ralph has decided; and sometimes Colleen goes first and Ralph chooses second. The payoff matrix for this game is as follows, where Ralph's payoff is listed first and Colleen's payoff is listed second:

		Colleen		
		Left	Middle	Right
Ralph	Top	3, 1	2, 3	10, 2
	High	4, 5	3, 0	6, 4
	Low	2, 2	5, 4	12, 3
	Bottom	5, 6	4, 5	9, 7

a) Suppose Ralph and Colleen choose their strategies simultaneously. How do you think the game will turn out? Use the solution concepts we developed in class and explain your answer in a step-by-step fashion.

Neither Top nor High are rationalizable strategies, because neither is ever a best response for Ralph to any of the strategy options of Colleen. If Colleen can safely assume that Ralph will never play either one, then she will eliminate Left from consideration, because it is not rationalizable for her in that it is not a best response to either Low or Bottom by Ralph. That leaves us with the lower right 2x2 payoff matrix outlined above, with Low and Bottom as the strategy options for Ralph and Middle and Right as the strategy options for Colleen. Ralph has a dominant strategy of Low, and will most likely play this. Colleen, knowing this, will choose to play Middle as her best response. The strategy pair Low/Middle is a Nash equilibrium, because each player has chosen their best strategy, given the strategy chosen by the other player.

b) Now suppose that Ralph and Colleen decide to play the game sequentially, with one of them going first and the other one going second, choosing their strategy after seeing the strategy choice of the one who went first. Feeling chivalrous, Ralph lets Colleen choose whether she wants to go first or second. Colleen turns to you for advice. Draw the two game trees and explain whether Colleen should choose to go first or second.
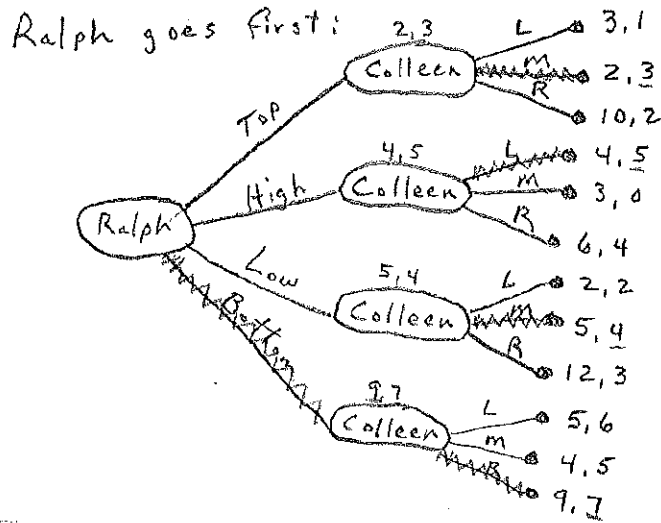
Ralph goes first:

SPNE is Ralph plays Bottom and Colleen plays Right. Ralph receives payoff of 9 and Colleen receives 7.

Colleen goes first:
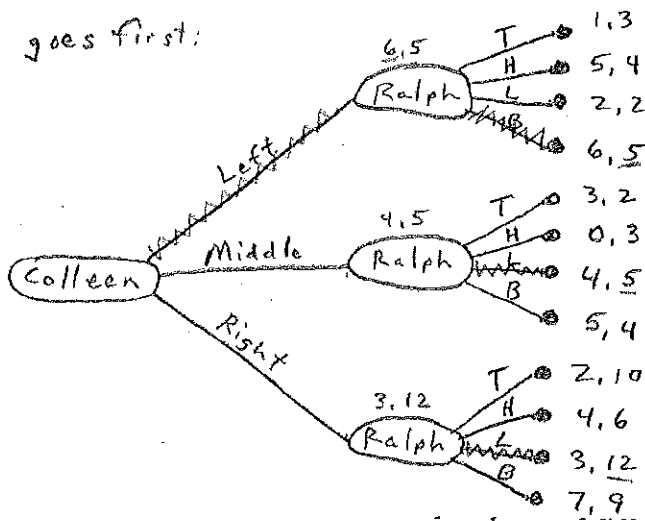
SPNE is Colleen plays Left and Ralph plays Bottom. Colleen receives a payoff of 6 and Ralph receives 5.

Both Ralph and Colleen are better off if she goes second.