**ECO 610**
**Final Exam**
**TEI Piraeus/University of Kentucky MBA Program**
**December 2008**

**Name** KEY

**e-mail address**_____

**Instructions:** Answer each question in the space provided. Point values are indicated beside each question. 80 points total. You have four hours to complete this exam, so you should use your time wisely so that you are able to answer all questions. You may use your own textbook, class notes, handouts, or other written material from the course, but you may not borrow anything from another student during the exam. You may use your own calculator, but you may not borrow a calculator from another student. Talking with another classmate during the exam is forbidden! You may ask Petros if you have any questions. Please write clearly. Good luck!

Multiple Choice Questions: 2 points each, circle the correct answer.

1. Which of the following would cause the demand curve for Greek wines to increase, i.e. shift to the right?
   a) A fall in the price of Italian and French wines.
   b) A fall in the price of Greek wine.
   c) A fungus that ruins grapes in Greek vineyards.
   d) An increase in the price of beer.

D

2. You own the only movie theater (cinema) in Rafina, Greece. You find that when you reduce the price of admission from 6 euros to 4 euros, weekly attendance increases from 600 to 700. Own-price elasticity of demand is approximately equal to:
   a) 50
   b) 2.0
   c) 1.0
   d) 0.5

D

3. Last year European fashion designers decided to use more alligator skins in their latest shoes, accessories, and clothes. The price of alligator skins rose as a result of this increase in market demand. As time passes and the market adjusts, we would expect:
   a) Fewer alligator farmers and a lower price for alligator skins.
   b) More alligator farmers and a higher price for alligator skins.
   c) Fewer alligator farmers and a higher price for alligator skins.
   d) More alligator farmers and a lower price for alligator skins.

D

4. The short-run average cost curve is always U-shaped. The primary reason that the short run average total cost curve initially slopes downward is because:
   a) Average fixed costs initially fall sharply as the firm "spreads its overhead."
   b) The law of diminishing returns.
   c) Economies of scale.
   d) Increasing marginal returns will be present.

A

5. When Q=4, average variable cost is equal to $10 and average fixed cost is equal to $15. When Q=5, average total cost is equal to $25. What is the marginal cost of the fifth unit of output?
   a) $10
   b) $15
   c) $25
   d) $50

C

6. The cross-price elasticity of demand between two products is 0.0. For which of the following products might this be true?
   a) Toothbrushes and toothpaste.
   b) Mouthwash and toothpaste.
   c) Orange juice and toothpaste.
   d) Toothbrushes and dental floss.

C

Answer each of the following questions in the space provided. Point values are indicated beside each question.

7. (4 pts.) What are the characteristics of the market for cruise ships in the Mediterranean Sea? What kind of market structure is it?

- small number of firms
- differentiated product
- significant barriers to entry

∴ oligopoly

8. (6 pts.) The University of Kentucky and TEI-Piraeus decide to expand their MBA program and offer a full-time daytime program. Tuition for this program would be 10,000€, and textbooks and other school supplies are estimated to be 2,000€. Students would attend classes and do schoolwork full time for an entire year in order to earn their diploma. Your younger sister sees how much you are learning in your program, which inspires her to think about whether she should enter this new program. She works full time in Athens and is currently earning 20,000€ per year. The rent on her apartment is 6,000€ per year, her food expenses are 3,000€, and other living expenses come to 5,000€. She thus estimates the cost of taking a year and getting her MBA degree to be:

| | |
|---|---|
| Tuition | 10,000€ |
| Books and supplies | 2,000€ |
| Apartment rent | 6,000€ |
| Meals | 3,000€ |
| Living expenses | 5,000€ |
| Total cost | 26,000€ |

Has she calculated the economic costs of getting an MBA correctly?

Tuition - yes
Books and supplies - yes
apartment rent - NO!
meals - NO!
living expenses - NO!

} your sister incurs these expenses whether or not she enrolls in the MBA program

Plus, your sister has not considered the loss of one year's salary — 20,000 €.
So the total cost is 10,000 + 2,000 + 20,000
or 32,000 €.

9. (6 pts.) Briefly explain why we see the following patterns in many industries:
   a) Small firms are more likely to outsource production of inputs than are large firms.

economies of scale - a small firm is less likely to use enough of an input to exhaust economies of scale in the production of the input.

   b) "Standard" inputs (used by several different firms) are more likely to be outsourced than are "tailor-made" inputs (used by only one firm).

specific assets - a specialized or tailor-made input is more likely to involve the use of specific assets, so vertical integration (make) is more likely.

10. (6 pts.) McCain's is a multinational food company. To serve the European market, it builds a large factory to make frozen French fries and other potato products in France. It enters into long-term contracts with a large number of nearby farmers to supply it with potatoes. Why is it in McCain's interest to have a formal vertical connection with its input suppliers? Why is it in the farmers' interests to have a formal vertical connection?

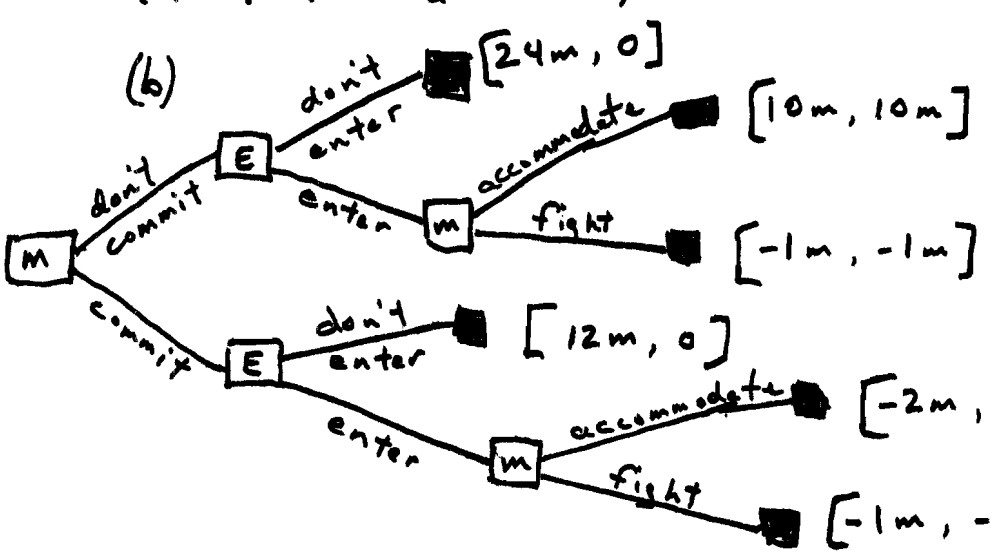
- McCain's:
  - extensive coordination of production
  - elimination of uncertainty
  - investment in specific assets, so avoid possibility of hold up.
- farmers:
  - elimination of uncertainty
  - fixed irreversible investments in large potato farming production, so avoid possibility of hold up.

11. (8 pts.) Your sister is the mayor of Napflio. She awards you the monopoly franchise rights to provide cable TV services to citizens of Napflio. As such, you are the only provider and as long as you have no competition, the discounted present value of your economic profit stream is 24,000,000€. Trouble looms on the horizon, however, because a satellite TV company is considering entering your market. Your monopoly franchise rights only apply to hard-wired cable TV, and do not apply to satellite signals and rooftop satellite dishes. If entry occurs and you share the market with a competitor, your discounted present value of economic profits will fall to 10,000,000€. If you contest entry and fight a price "war," the discounted present value of economic profits is negative 1,000,000€.
    a) You announce publicly that if entry occurs, you will fight. Is your threat credible? Why or why not?
    b) In preparation to fight a price war, you could add capacity to your system, so that you could offer additional channels that your competitor did not. The cost of adding such capacity in preparation to fight for customers is 12,000,000€. Only if entry occurs would you find it necessary to utilize this capacity. Should you make such a commitment to deter entry? Explain why or why not. It would help if you draw the decision tree for this sequential-move game.

$\pi_m = 24m€$ $\pi_d = 10m€$ $\pi_w = -1m€$

(a) No. $\pi_d > \pi_w$, so accommodate instead of fight.

(b)




Yes, you should add capacity to deter entry. You make more profit (12m vs 10m) and your threat to fight is credible (-1m > -2m).

12. (6 pts.) Most non-liquid non-bulk ocean cargo is hauled in container ships. Container ships today are much larger today than they were twenty years ago. What two economic factors might cause there to be economies of scale in ocean-going container ships?

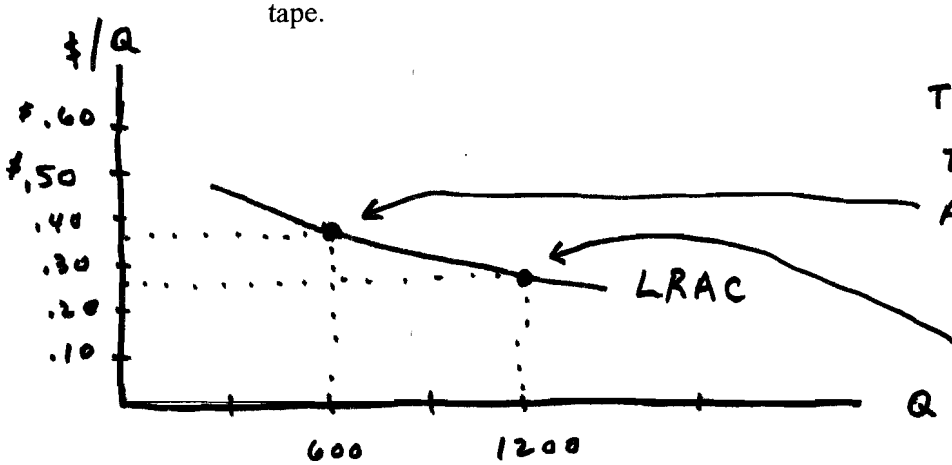
- fixed set-up costs - only need one captain and crew for small ship or large one.
- engineering relationships - rule of cube-square, you don't twice as much steel or twice as big an engine for a ship that has twice the cargo capacity.

13. (8 pts.) You work for 4M—Middle Mississippi Mining and Manufacturing Co. Your company produces tape (good Y). To produce this tape 4M must spend $100 million to perfect the process of working with chemical adhesives, attaching these adhesives to cellophane, and manufacturing and packaging tape. Once this setup cost is incurred, each roll of tape can be produced at a cost of $0.20 each. Thus, TC(Y) = $100,000,000 + $0.20Y.

Given that 4M has made the investment in developing the know-how for manufacturing tape, much of this knowledge can be applied to producing related products, such as adhesive message notes (good X). For an additional $20 million investment, you can ramp up production of stick-up notes (not to be confused with Post-It notes, which are trademarked by the 3M Company). These stick-up notes can be produced at a cost of $.05 per pack. Thus the total cost of producing tape and stick-up notes together is given by TC(X,Y) = $120,000,000 + $0.05X + $0.20Y.

Finally, a stand-alone company that did not produce tape would have to incur an initial investment of $50 million in order to begin producing stick-up notes from scratch. Its total cost function would be TC(X) = $50,000,000 + $0.05X.

a) What does the LRAC for tape look like, i.e. are there economies or diseconomies of scale? Hint: calculate the cost of producing 600 million and 1200 million rolls of tape.




Y = tape

$TC(Y) = 100,000,000 + .2Y$

$TC(600m) = \$220,000,000$

$ATC(600m) = \frac{220}{600} = \$.367$

$TC(1200m) = \$340,000,000$

$ATC(1200m) = \frac{340}{1200} = \$.283$

b) Does it make sense for 4M to produce both tape and stick-up notes, i.e. are there economies of scope? Hint: compute TC(0, 600m), TC(100m, 0), and TC(100m, 600m).

- $TC(0, 600m) = 100m + .2(600m) = \$220m$
- $TC(100m, 0) = 50m + .05(100m) = \$55m$
- $TC(100m, 600m) = 120m + .05(100m) + .2(600m)$
  $= \$245m$

Economies of scope if:

$TC(100m, 600m) < TC(100m, 0) + TC(0, 600m)$

$\$245m < \$55m + \$220m$

yes.

14. (8 pts.) Suppose that the oil industry consists of only two producers, Russia and OPEC. Russia has two possible strategies: produce either 2 million or 4 million barrels of oil per day, and OPEC has two possible strategies: produce either 8 million or 10 million barrels of oil per day. Depending on the strategies chosen by Russia and OPEC, total output in the world market will be 10, 12, or 14 million barrels, resulting in a world price of oil that is \$120, \$90, or \$60, respectively, depending on the combined output of Russia and OPEC. Production costs are \$40 per barrel in Russia and \$20 per barrel in OPEC. Determine the profit payoffs of Russia and OPEC for each combination of possible strategies, and then illustrate these payoffs in a 2x2 matrix. What do you predict will be the outcome of this game?

| World output | Price | Russia profit per barrel | OPEC profit per barrel |
|---|---|---|---|
| 10 | \$120 | \$80 | \$100 |
| 12 | \$90 | \$50 | \$70 |
| 14 | \$60 | \$20 | \$40 |

World output = Russia output + OPEC output

payoff matrix:

| OPEC \ Russia | 2m | 4m |
|---|---|---|
| 8m | (800), 160 | 560, (200) |
| 10m | 700, (100) | 400, 80 |

① if $Q_{OPEC} = 8$ and $Q_R = 2$
$Q_{world} = 10$ and $P = \$120$.
$\pi_{OPEC} = 8 * 100 = 800$
$\pi_{Russia} = 2 * 80 = 160$

② if $Q_{OPEC} = 8$ and $Q_R = 4$
$Q_{world} = 12$ and $P = \$90$.
$\pi_{OPEC} = 8 * 70 = 560$
$\pi_R = 4 * 50 = 200$

③ if $Q_{OPEC} = 10$ and $Q_R = 2$
$Q_{world} = 12$ and ...

OPEC has dominant strategy to produce 8m barrels; as Russia, knowing that OPEC will play its dominant strategy, should produce 4m barrels.

15. (8 pts.) Hotel de Christos currently is the only hotel serving a small Greek island. It has 200 guest rooms and does a steady business. Given the number of tourists who visit this island, it generally stays pretty full, and occasionally is overbooked. You own some property on the island close to Hotel de Christos, and are considering opening your own hotel. Should you enter on a large scale or on a small scale? Explain why. What name would you apply to your strategy?

Hotel de Christos has a large sunk investment in capacity and is something of a fat cat. It will be reluctant to engage in a price war if you enter on a small scale, because it would have to reduce prices for all of its customers. So entering the market as a puppy dog is unlikely to provoke an aggressive response by Hotel de Christos.

16. (8 pts.) Given what you know about the market for video game consoles, which characteristics might facilitate tacit collusion and which characteristics might make tacit collusion difficult?

Video games consoles:

- small number of sellers - makes collusion easier
- differentiated product - makes price collusion more difficult
- significant barriers to entry - makes collusion easier
- rapid technological change - makes collusion less likely