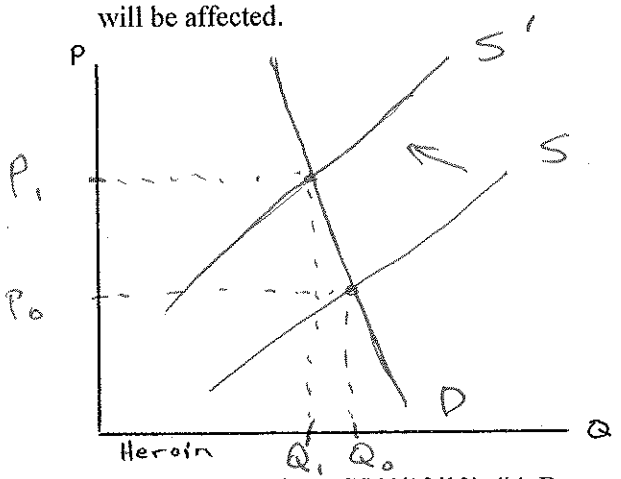
MBA 603 Exam
September 2013

Name: KEY

100 points total. Point values for each question are as indicated. Answer each question in the space provided. General advice: show your work, including any formulas or diagrams that you use in reasoning through your answers. Multiple choice questions are worth 5 pts. each. Circle the correct answer.

1. (10 pts.) Heroin is physically addictive and hence the demand for it by heroin addicts is very price inelastic. Many heroin addicts finance their consumption of heroin through shoplifting, petty theft, robbery, and other criminal acts. Suppose the U.S. Drug Enforcement Agency increases enforcement activities along the borders of the U.S. and increases the penalties against suppliers. In the diagram below illustrate what you think will happen to the market price of heroin and the quantity exchanged. Then explain what is likely to happen to the expense of having a heroin habit and how crime rates will be affected.



inelastic demand – small decrease in Q leads to a big increase in P. Heroin addicts will have to increase their criminal activity.

2. (10 pts.) From the *WSJ* (4/18/13): "A Bumper Crop and Chinese Go Nuts": A stream of Chinese nationals have descended on southern Georgia, looking to buy peanuts. Exports to China are expected to reach record levels. This is the result of cheap prices for peanuts after a record crop last year in 2012—representing an 84% increase over 2011 when 3.6 billion pounds were harvested in the U.S. Prices have fallen from \$0.70 to \$0.45 cents per pound.
   a) Calculate the own-price elasticity of demand for peanuts.

$$\varepsilon_{x,P_x} = \frac{\%\Delta Q}{\%\Delta P} = \frac{84\%}{\frac{70-45}{\frac{1}{2}(70+45)}} = \frac{84\%}{\frac{25}{57.5}}$$

$$\varepsilon_{x,P_x} = 1.93 \quad \text{or} \quad \frac{84}{\frac{25}{70}} = 2.35$$

   b) Based on your answer to (a), did peanut farmers' incomes go up or down in aggregate between 2011 and 2012? Briefly explain your answer.

$\varepsilon_{x,P_x} > 1$ demand is elastic

Total revenue from farmers' sales of peanuts goes up when price falls if demand is elastic. Peanut farmers' incomes rise.

3. (15 pts.) Janet opens a shop in Mt. Pleasant, SC that sells Christmas items to tourists. Her sales revenues are $400,000 per year. She incurs costs of $200,000 for cost of goods sold, $75,000 for wages paid to hourly employees, $20,000 for taxes and insurance, $25,000 for rent, and $10,000 for utilities. Janet works full time in the shop and doesn't pay herself a salary. Formerly she worked as a secretary for the local high school earning $45,000 per year. She and her husband have $100,000 of their savings tied up as working capital in the business. They typically earn 5% on their investments in mutual funds.

a) What are Janet's accounting profits?

Total Revenue = $400,000

Explicit Costs: $200,000 cost of goods sold
75,000 wages
20,000 taxes, insurance
25,000 rent
10,000 utilities
Total Explicit → 330,000

Acctng Π = $70,000

b) What are Janet's economic profits? Should she continue in the business?

Implicit Costs: $45,000 opp cost of her time
5,000 (100,000 @ 5%) foregone interest income
$50,000

Total Cost = Total Explicit + Total Implicit
= $380,000

Econ Profit = $400,000 − 380,000 = $20,000 so Yes!

c) After several years, Janet decides that she wants to retire. She offers to sell the business to her sister, who is a CPA earning $80,000 per year. Her sister evaluates the business and declares that to be a bad idea for her. Is she making a mistake? What would her economic profits be? (Assume that she would take $100,000 out of her own savings and pay Janet for her investment in the business.)

Sister's Implicit Costs: 80,000 opp cost of time
5,000 interest foregone
85,000

Econ Π = $400,000 − 330,000 − 85,000 = −$15,000

Sister would be $15,000 per year worse off if she quit her job and bought the shop.

4. The short-run average total cost curve is U-shaped because:

a) AFC + AVC = ATC
b) AFC is constantly declining with output.
c) Beyond some point AVC slopes upward because of diminishing returns.
d) SRATC declines and then increases because all of the above are true.

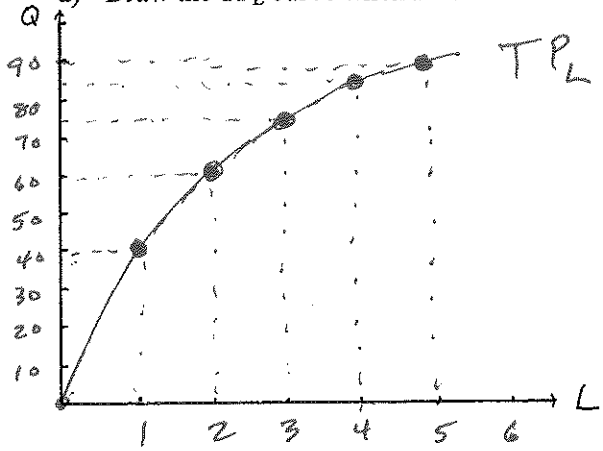
D

5. (15 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)

a) Draw the TP_L curve when K is fixed at 2 in the short run.



b) Does this production process exhibit diminishing returns? Pick a set of combinations of inputs to illustrate and explain your answer.

$\bar{K}=2$	L	Q	MP_L
	1	40	20
	2	60	15
	3	75	10
	4	85	

additional units of L added to $\bar{K}$ cause Q to go up by smaller and smaller amounts.

c) Does this production function exhibit increasing, constant, or decreasing returns to scale? Pick a set of combinations of inputs to illustrate and explain your answer.

Returns to scale - double all inputs and see what happens to output:

(1)

L	K	Q
1	1	20
2	2	60

> output more than doubles; so increasing RTS

(2)

L	K	Q
2	2	60
4	4	110

> output less than doubles, so decreasing RTS

6. Subaru has a problem. What is it?

a) Problems with its boxster engine forced it to recall thousands of vehicles.
b) Workers at its Indiana plant have threatened to strike for higher wages.
c) Sales have outstripped its capacity to produce cars.
d) Its failure to produce a pick-up truck has hurt its image in the U.S. market.

C

7. (10 pts.) After retiring from the military, Mel decides to go into the chair-making business. In addition to wood, he uses capital and labor to produce wooden chairs. He is trying to determine whether he is using the right amount of tools and machinery with his workers. Currently he can produce an additional chair per hour by adding two workers to his current mix of tools and machinery. Alternatively, he could rent additional tools and machinery in combination with his current number of workers that would allow him to increase his output of chairs by one per hour. If Mel pays his workers a wage rate of $10 per hour, and the rent he would have to pay for the additional capital is $15 per hour, is Mel minimizing the cost of producing his chosen output? If Mel is not minimizing cost, how should he alter his input mix?

$MP_L = 0.5$ chairs / hr

$MP_K = 1.0$ chairs / hr

Does $\frac{MP_L}{w} = \frac{MP_K}{r}$?

$\frac{0.5}{10} \neq \frac{1.0}{15}$? $\frac{1}{20} < \frac{1}{15}$, so Mel is not minimizing cost. He should use more K and less L.

8. (5 pts.) Ocean-going container ships have grown from the Ideal X built in the 1950s which carried 58 containers to the recently launched Marco Polo which can carry 16,000 containers. Marco Polo's cost per container is much lower than Ideal X's cost per container. Can you think of any economic explanations for why this might be so?

Reasons for economies of scale in ships:

① cube-square rule – carrying capacity of a ship increases more than proportionately to its external surface.

② fixed set-up costs – only need one captain and crew.

9. Product A is peanut butter. Product B is jelly. Product C is toothpaste. There are economies of scope across the production and distribution of peanut butter and jelly. There are no economies of scope across the production and distribution of either peanut butter and toothpaste or jelly and toothpaste. Hence we would say that

a) $TC(A, B) < TC(A, 0) + TC(0, B)$
b) $TC(A, C) = TC(A, 0) + TC(0, C)$
c) $TC(B, C) = TC(B, 0) + TC(0, C)$
(d) All of the above are true.

10. TFC = $2000, AVC = $10, and ATC = $12. What is Q?

$AFC = ATC - AVC = 12 - 10 = 2$

$AFC = \frac{TFC}{Q} \Rightarrow Q = \frac{TFC}{AFC} = \frac{2000}{2}$

a) 100
b) 500
C c) 1000
d) Can't be determined from the information given.

11. (10 pts.) Briefly explain five reasons why a firm might choose to vertically integrate upstream or downstream in its vertical chain of production.

(1) production efficiencies - physical production process is more efficiently handled by one firm
(2) extensive coordination - complicated production process requires central direction by one firm
(3) information asymmetries - seller knows more about quality of the input than downstream buyer
(4) reputation externalities - each downstream retailer affects the reputation of the entire chain
(5) relationship-specific assets - upstream-downstream relationship requires up-front irreversible investments in specific assets

12. Which of the below is not one of the three basic questions that every economic system must answer:

a) Who gets the goods and services that are produced?
b) What production techniques will be used to produce goods and services?
C c) How will the economy put unemployed resources to work?
d) What goods will be produced and in what amounts?