ECON 180 - Regulation & Antitrust Policy
Drake University, Spring 2015
William M. Boal

Signature: ______________________________

Printed name: ______________________________

TEST 2 VERSION A
"Competitive Firms"

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators or calculators with alphabetical keyboards are NOT permitted. Mobile phones or other wireless devices are NOT permitted. Points will be subtracted for illegible writing or incorrect rounding. Point values for each question are noted in brackets.

I. Problems: Insert your answer to each question below in the box provided. Feel free to use the margins for scratch work—only the answers in the boxes will be graded. Work carefully—partial credit is not normally given for questions in this section.

(1) [Profit maximization: 20 pts] Suppose a firm's total revenue function is given by $Rev(q) = 20q - (q^2/10)$, and its total cost function is given by $TC(q) = 2q + (q^2/20)$. Find the following, showing your work and circling your final answers.

a. Find the firm's marginal revenue function MR(q).

b. Does this firm take price as given? Why or why not?

c. Find the firm's marginal cost function MC(q).

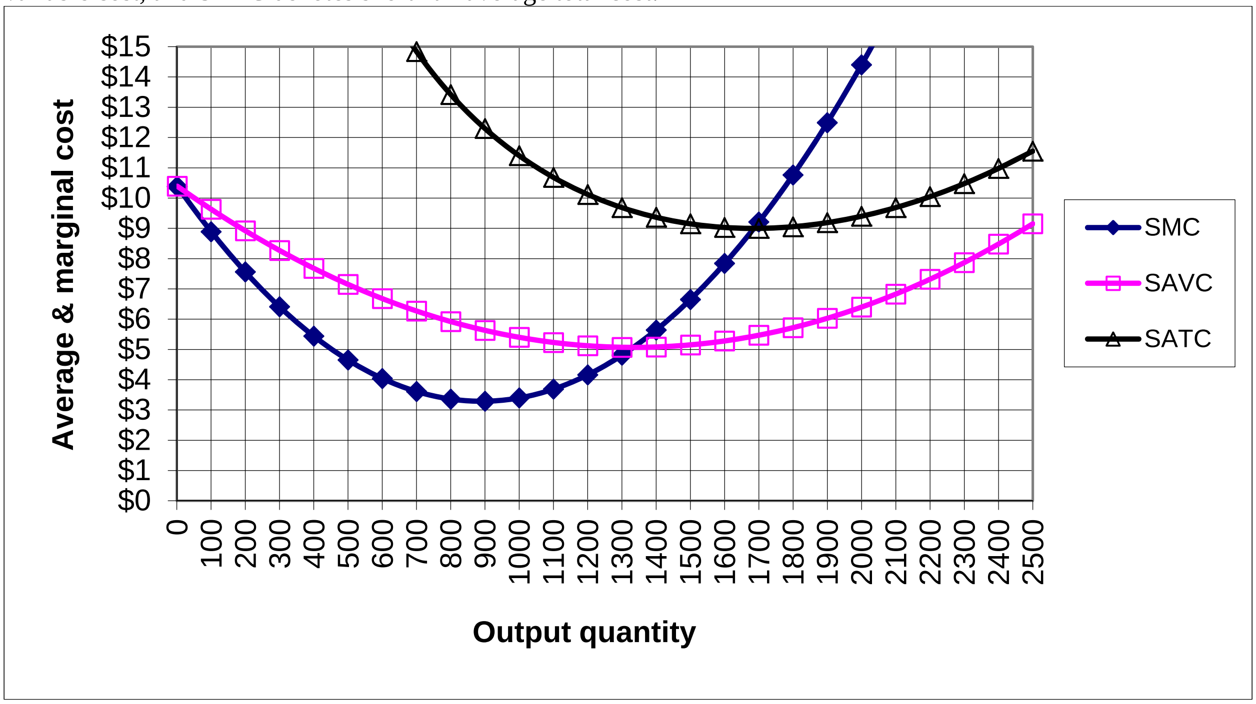
d. Compute the firm's profit-maximizing level of output q*. Show your work and circle your final answer.

(2) [Profit maximization while taking price as given: 20 pts] Suppose the market price of an item is $7 and a firm that produces that item has a total cost function given by $TC(q) = 2q + (q^2/100)$. Assume the firm takes price as given. Answer the following questions, showing your work and circling your final answers.

a. How much output (q) should the firm produce to maximize profit?

b. How much profit will the firm enjoy?

(3) [Short-run cost curves and supply: 30 pts] Acme Snow Shovel Company makes snow shovels. It is a small firm in a big market, and therefore takes its output price as given. In the short run, Acme faces daily cost curves as shown in the following diagram. Here, SMC denotes short-run marginal cost, SAVC denotes short-run average variable cost, and SATC denotes short-run average total cost.



a. Suppose Acme were currently producing 600 shovels for some unknown reason. If Acme produced one more shovel, by how much would its total cost increase? That is, what would be the *change in total cost* as Acme increased output from 600 to 601 shovels? (Give an answer to the nearest dollar.)	$
b. Suppose Acme were currently producing 1200 shovels for some unknown reason. Compute Acme's short-run total cost. (Give an answer to the nearest thousand dollars.)	$ thousand
c. What is Acme's break-even price—that is, the lowest price at which the company can avoid losses? (Give an answer to the nearest dollar.)	$
d. What is Acme's shut-down price—that is, the lowest price at which it will remain in operation in the short run? (Give an answer to the nearest dollar.)	$
e. Suppose the price of shovels is $8. How many shovels should Acme produce to maximize profit? (Give an answer to the nearest hundred.)	shovels
f. Will Acme make a *profit* or a *loss* at a price of $8? Or will it *break even*?	
g. Suppose the price of shovels is $11 How many shovels should Acme produce to maximize profit? (Give an answer to the nearest hundred.)	shovels
h. Will Acme make a *profit* or a *loss* at a price of $11? Or will it *break even*?	
i. Suppose the price of shovels is $4 How many shovels should Acme produce to maximize profit? (Give an answer to the nearest hundred.)	shovels
j. Will Acme make a *profit* or a *loss* at a price of $4? Or will it *break even*?	

(4) [Long-run cost and supply: 20 pts] Suppose a firm faces a (long-run) total cost function given by $TC(q) = q^3 - 80\,q^2 + 1605\,q$. Find the following, showing your work and circling your final answers.

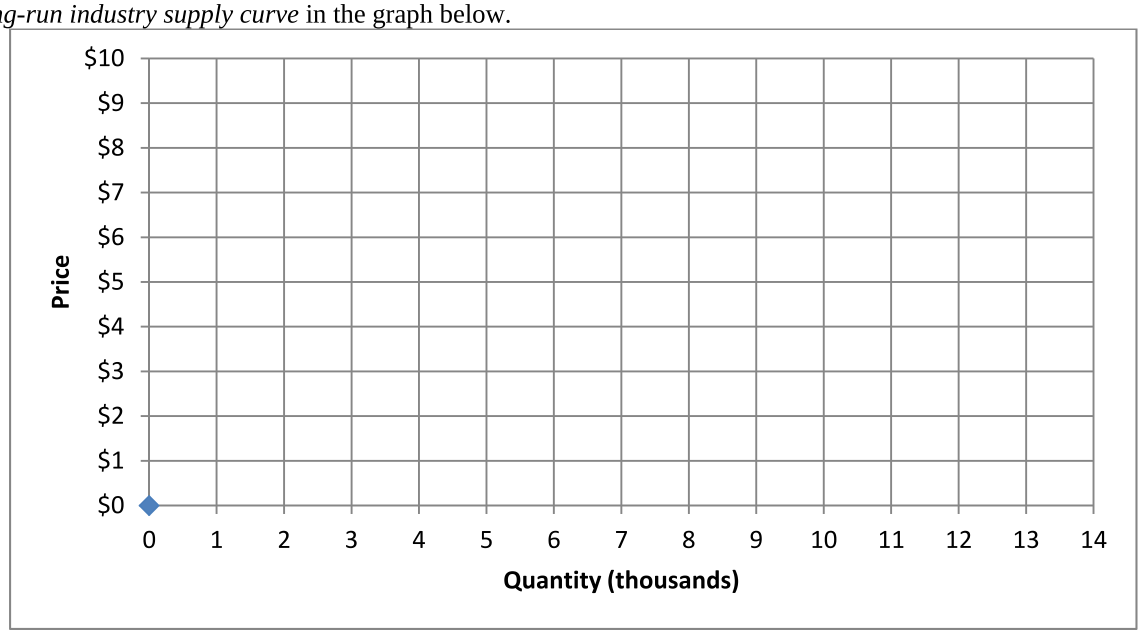
a. Find the firm's marginal cost function MC(q).

b. Find the firm's average cost function AC(q).

c. Compute the firm's so-called "efficient scale" of output.

d. Compute the firm's breakeven price.

e. Suppose all firms in this industry have the same costs, and these costs are not affected by other firms in the same industry or by total industry output. Further assume the industry enjoys free entry and exit. Draw and label the *long-run industry supply curve* in the graph below.



III. Critical thinking [10 pts]

Suppose a competitive producer wants to maximize profit. Should it choose a level of output where average cost is lowest? Why or why not? Illustrate your answer with a graph of the producer's cost curves.

[end of quiz]