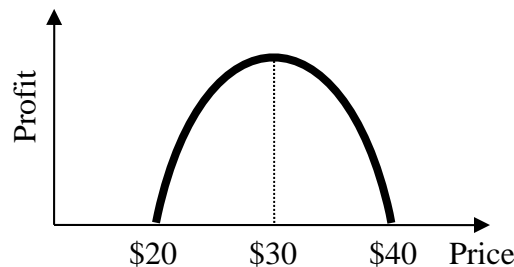


TEST 10 VERSION B "Introduction to Economic Regulation"

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) [Theories of regulation: 12 pts] The following graph relates the economic profit of a regulated monopoly to its price. Assume that the monopoly's average cost and marginal cost both equal \$20.



- a. What price will be set by the regulatory agency, according to the “capture theory” of regulation?
- b. What price will be set by the regulatory agency, according to the “public interest theory” (also called the “normative analysis as positive theory”) of regulation?
- c. What price will be set by the regulatory agency, according to the Stigler-Peltzman theory of regulation?

	\$
	\$
	\$

(2) [Ramsey pricing: 10 pts] Suppose a regulated monopoly produces three products with the following price elasticities of demand.

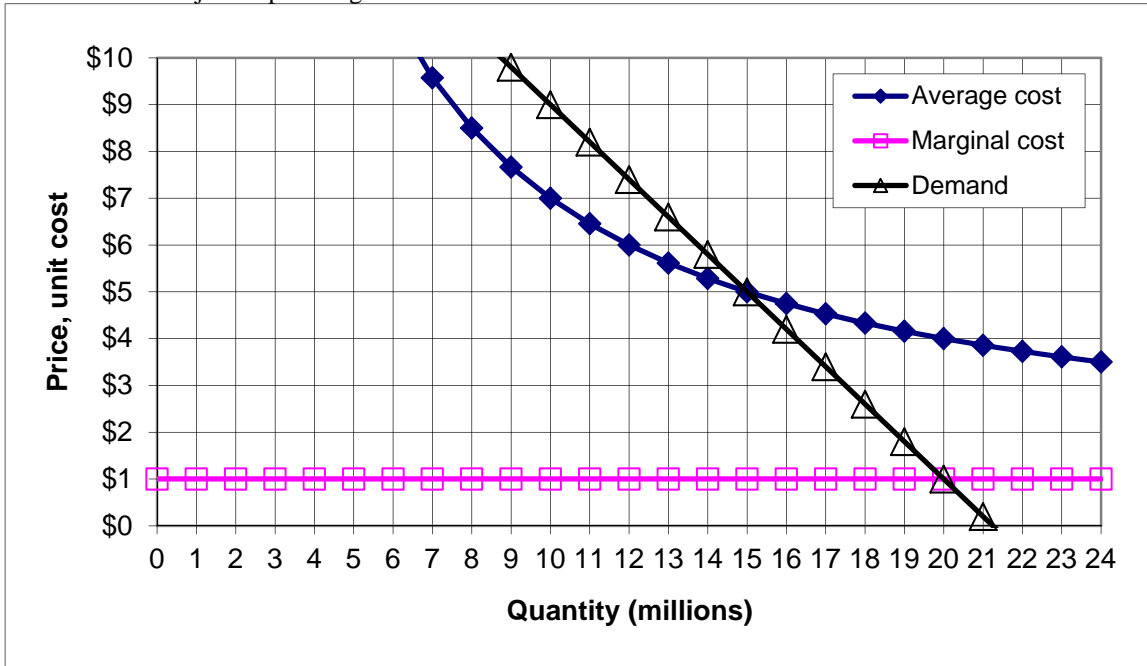
	Price elasticity
Product (i)	-4.0
Product (ii)	-2.5
Product (iii)	-3.0

Unfortunately, due to economies of scale, marginal cost pricing will not completely recover the monopoly's costs. Suppose Ramsey pricing is used to recover the extra costs. (Assume that cross-price elasticities of demand for these products are zero.)

- a. Which product should have the smallest markup $\left(\frac{P-MC}{P}\right)$?
- b. If the Ramsey markup for product (i) is 5%, what should be the markup for product (ii)?

	%

(3) [Pricing with economies of scale: 30 pts] The following graph shows average cost, marginal cost, and market demand for a firm subject to price regulation.



First, suppose the regulator uses marginal-cost pricing.

- a. What price would be set?
- b. Does the firm experience economic profit, loss, or neither?
- c. How much?
- d. Compute the social deadweight loss from this policy.

\$	
\$	million
\$	million

Second, suppose the regulator uses average-cost pricing.

- e. What price would be set?
- f. Does the firm experience economic profit, loss, or neither?
- g. How much?
- h. Compute the social deadweight loss from this policy.

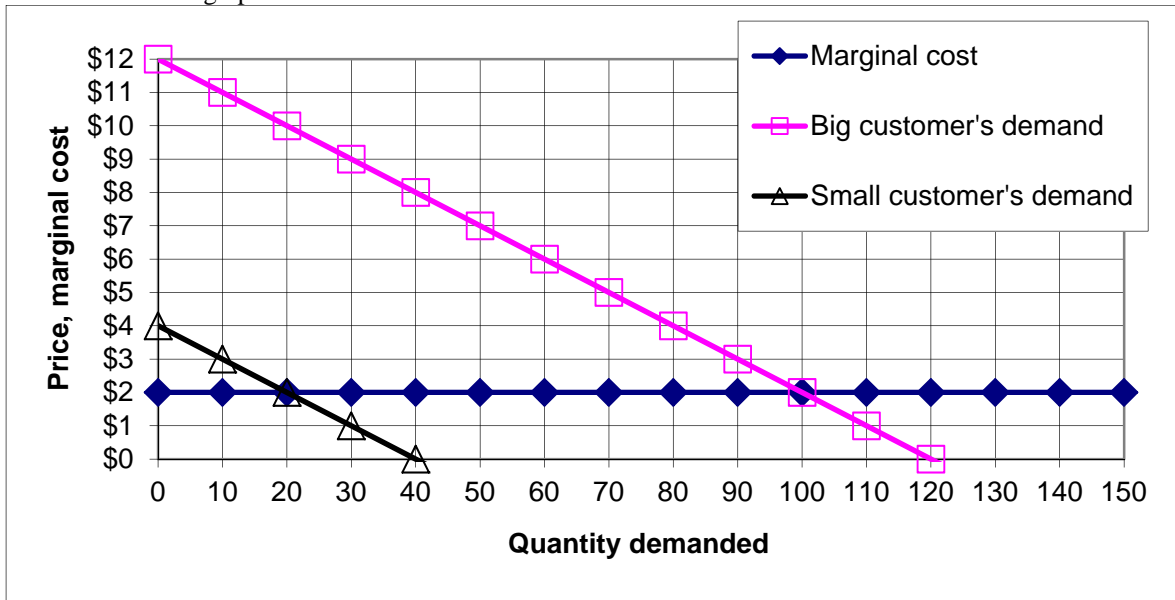
\$	
\$	million
\$	million

Third, suppose the regulator uses a two-part tariff to maximize social welfare (efficiency) while permitting the firm to break even.

- i. What per-unit price would be set?
- j. What per-customer fixed charge (or "entry fee") would be set? Assume the firm has 5 million customers with identical individual demands.

\$	
\$	

(4) [Multipart tariffs: 39 pts] Suppose a regulated firm has a marginal cost (= average variable cost) of \$2. In addition to the marginal cost shown in the graph below, the firm has "fixed" or overhead costs of \$50 million per month. The firm serves both big customers and customers. Their representative individual monthly demand curves are also shown in the graph.



Consider two alternative tariffs:

- (i) Two-part tariff consisting of an entry fee (or monthly charge) of \$50 and a per-unit usage charge of \$2 per unit.
- (ii) Declining-block tariff. Each customer must pay \$3 per unit for the first 30 units purchased, and \$2 per unit thereafter.

Assume there are **one million big customers and two million small customers**. Compute the following.

- a. What quantity would a typical big customer buy?
- b. What quantity would a typical small customer buy?
- c. Compute the firm's total revenue.
- d. Compute the firm's total cost (including the "fixed" cost).
- e. Does the firm make a *profit*, a *loss*, or just *break even*?
- f. Compute the social deadweight loss from this pricing policy.

	(i) Two-part tariff	(ii) Declining-block tariff
	units	units
	units	units
	\$ million	\$ million
	\$ million	\$ million
	\$ million	\$ million

g. Which of these tariffs do you favor? Why?

II. Critical thinking [9 pts]

Suppose the total cost function for a particular product is given by $C(Q) = 100 + 10Q$. Does this product have subadditive costs? Prove that your answer is correct.

[end of quiz]