

EXAMINATION 4 VERSION B
"Perfect and Imperfect Competition"
November 30, 2022

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators, calculators with alphabetical keyboards, wireless devices and mobile phones are NOT permitted. Numerical answers, if rounded, must be correct to at least 3 significant digits. Point values for each question are noted in brackets. Maximum total points are 100.

I. Multiple choice: Please write your name and "Version B" on your answer sheet. Then mark the one best answer to each question on the answer sheet. [1 pt each, 22 pts total]

(1) Suppose the paper industry is perfectly competitive and the price of a ream of paper is \$6. Then any firm in the paper industry believes its marginal revenue is

- exactly equal to \$6.
- more than \$6.
- less than \$6.
- zero.

(2) The assumption that firms take the market price as given makes more sense if

- the necessary inputs to production are scarce.
- there are a large number of firms in the market.
- market demand is inelastic.
- the owners of the firms are personal friends.

(3) If consumers view the products of different firms as *perfect substitutes*, they will

- flip a coin to decide which brand to buy.
- buy some of each.
- choose whichever is cheaper.
- stay with their current brand, even if it is a little more expensive.

(4) Suppose the marginal cost producing of a car is \$20,000 but the marginal benefit to consumers of another car is \$15,000. Then producing one more car will

- decrease total surplus by \$10,000.
- decrease total surplus by \$5,000.
- increase total surplus by \$5,000.
- increase total surplus by \$10,000.
- increase total surplus by \$25,000.

(5) Efficiency in consumption requires that all consumers

- choose identical combinations, or bundles, of goods.
- have the same budget lines.
- have equal marginal rates of substitution.
- have equal incomes.
- All of the above.

(6) Firms X and Y both produce motor oil, but for some unknown reason, Firm X's marginal cost is \$7 and Firm Y's marginal cost is \$5. If one quart of output is shifted from Firm X to Firm Y, then total industry costs will

- increase by \$2.
- increase by \$3.
- increase by \$5.
- decrease by \$2.
- decrease by \$7.

(7) If the economy is perfectly competitive in all markets, it is always

- outside the production-possibility curve.
- on the production-possibility curve.
- inside the production-possibility curve.
- cannot be determined from the information given.

(8) Suppose the price of a mobile phone is \$400 and the price of a computer is \$1600. If the economy is perfectly competitive, then these prices indicate that the *economy's* opportunity cost of a phone is

- 1/4 of a computer.
- 1/2 of a computer.
- 1 computer.
- 2 computers.
- 4 computers.

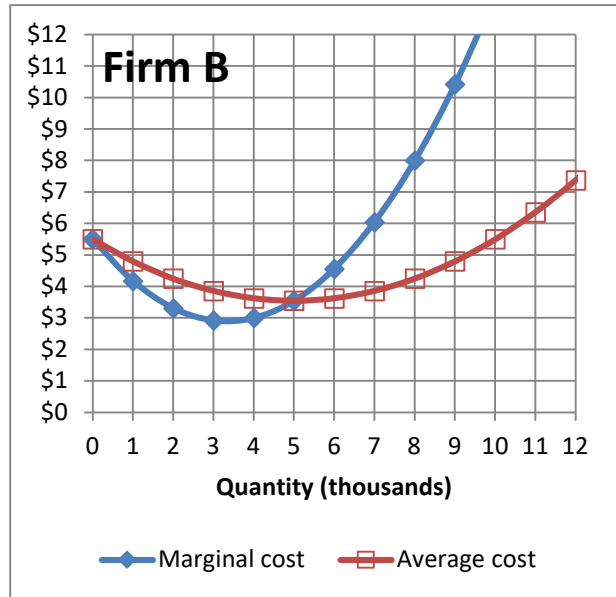
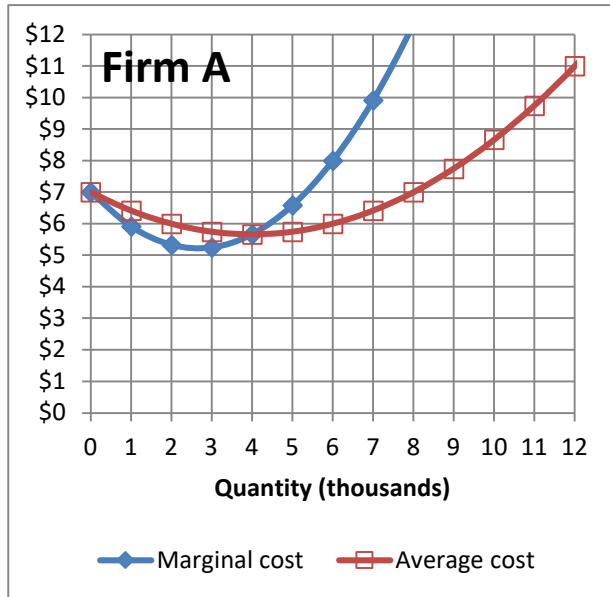
- (9) A monopoly expects that if it decreases its output, this will cause the price to
- increase.
 - decrease.
 - stay the same.
 - cannot be determined from information given.
- (10) If at the current level of output, a firm's marginal revenue is less than marginal cost,
- the firm can increase profit by increasing output.
 - the firm can increase profit by decreasing output.
 - the firm can increase profit by shutting down.
 - the firm cannot change its profit through small changes in output.
- (11) An industry is a natural monopoly if
- each firm's average cost curve slopes down.
 - the industry became a monopoly without government interference.
 - the only seller in the market sells a natural or "green" product.
 - one firm owns all the key natural resources required to produce the product.
- (12) Suppose a hotdog vendor sells 20 hotdogs per hour if the price is \$2, and sells 21 hotdogs if the price is \$1.95. The vendor's marginal revenue of the 21st hotdog is therefore
- \$0.05 .
 - \$0.95 .
 - \$1.00 .
 - \$1.95 .
 - \$2.00 .
- (13) A monopolist always sets price
- below marginal cost.
 - equal to marginal cost.
 - above marginal cost.
 - cannot be determined from the information given.
- (14) Under perfect price discrimination, consumer surplus is
- negative.
 - zero.
 - positive, but less than under single-price monopoly.
 - positive, and more than under single-price monopoly.
- (15) Perfect price discrimination is impractical because a monopolist
- faces downward-sloping demand.
 - cannot know how much each customer is willing to pay for the product.
 - always has a marginal cost greater than anyone's willingness to pay.
 - is not really interested in maximizing profit.
- (16) Cartels are organizations of firms that try to increase their members' profits by
- sharing technology.
 - boosting output.
 - increasing advertising.
 - offering discounts and promotional pricing.
 - reducing output.
- (17) Antitrust laws prohibit
- anticompetitive practices.
 - dishonest accounting practices.
 - deceptive advertising
 - all of the above.
- (18) The Cournot model of oligopoly predicts that as the number of firms decreases in an industry, the market price
- approaches zero.
 - approaches marginal cost.
 - approaches the monopoly price.
 - remains constant.
- (19) Suppose the automobile industry has five firms, each of which has the same marginal cost, and that the market elasticity of demand is -4. If the industry is a Cournot oligopoly, the markup of price over marginal cost $(P-MC)/P$ must be
- 4%.
 - 5%.
 - 10%.
 - 50%.
 - Cannot be determined from information given.
- (20) Products are said to be "differentiated" if
- different consumers buy different quantities of them.
 - one can buy them in fractional amounts.
 - consumers do not view them as perfect substitutes.
 - they are sold through different retail channels (stores, online, catalogs, etc.)

- (21) If the products of different firms are “differentiated,” then each firm
- a. takes price as given.
 - b. faces upward-sloping demand.
 - c. faces downward-sloping demand.
 - d. faces horizontal (perfectly elastic) demand.

- (22) Entry into the ethnic restaurant business is practically free, but each restaurant's cuisine is somewhat unique. Therefore, a sensible economic model for ethnic restaurants is
- a. perfect competition.
 - b. monopoly.
 - c. joint-profit-maximizing cartel.
 - d. monopolistic competition.

II. Problems: Insert your answer to each question in the box provided. Use margins and graphs 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) [Economy-wide efficiency: 12 pts] Suppose there are two firms in the industry producing snow shovels, with the marginal cost curves and average cost curves shown in the graph below.



- Suppose Firm A is currently producing 7 thousand snow shovels. If Firm A increases production by one snow shovel, by how much will its total cost increase? (Give an answer to the nearest whole dollar.)
- Suppose Firm B is currently producing 7 thousand snow shovels. If Firm B increases production by one snow shovel, by how much will its total cost increase? (Give an answer to the nearest whole dollar.)

	\$
	\$

First assume the firms' output levels must be set by a government planner. The planner wants the firms to produce a total of 14 thousand snow shovels, but total industry cost (that is, the combined costs for both firms) must be as low as possible.

- Which firm should be instructed to produce more output—Firm A or Firm B, or should they produce an equal amount of output to make total industry cost as low as possible?
- How much output should Firm A produce?
- How much output should Firm B produce?

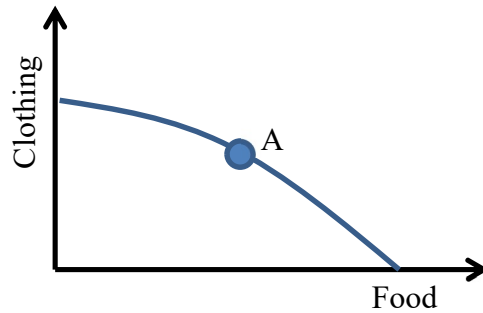
	thousand
	thousand

Alternatively assume there is no government planner. Assume instead that the two firms are competitive and that they each maximize their own profit while taking price as given.

- What price for snow shovels will motivate the two firms to produce a total of 14 thousand snow shovels at lowest total industry cost?

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(2) [Economy-wide efficiency: 16 pts] The graph below shows a country's production possibility curve. The country is currently at point A, where the slope equals $-1/2$.



- a. What is this **country's** opportunity cost of a unit of food?
- b. What is this **country's** opportunity cost of a unit of clothing?

units of clothing
units of food

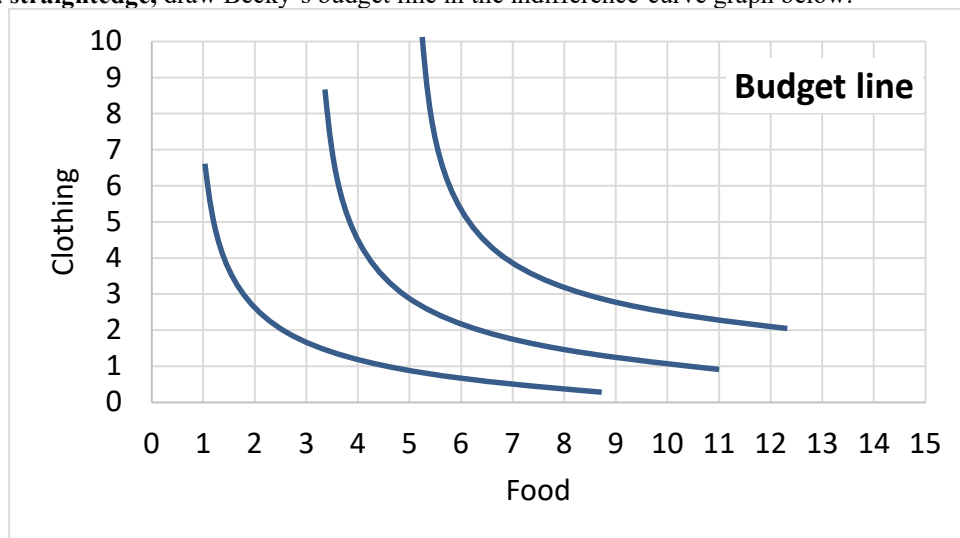
Assume this country's economy is in competitive equilibrium in all markets and the price of a unit of clothing is \$6.

- c. What must be the price of a unit of food?

\$

Becky is a consumer in this economy. She has an income of \$30.

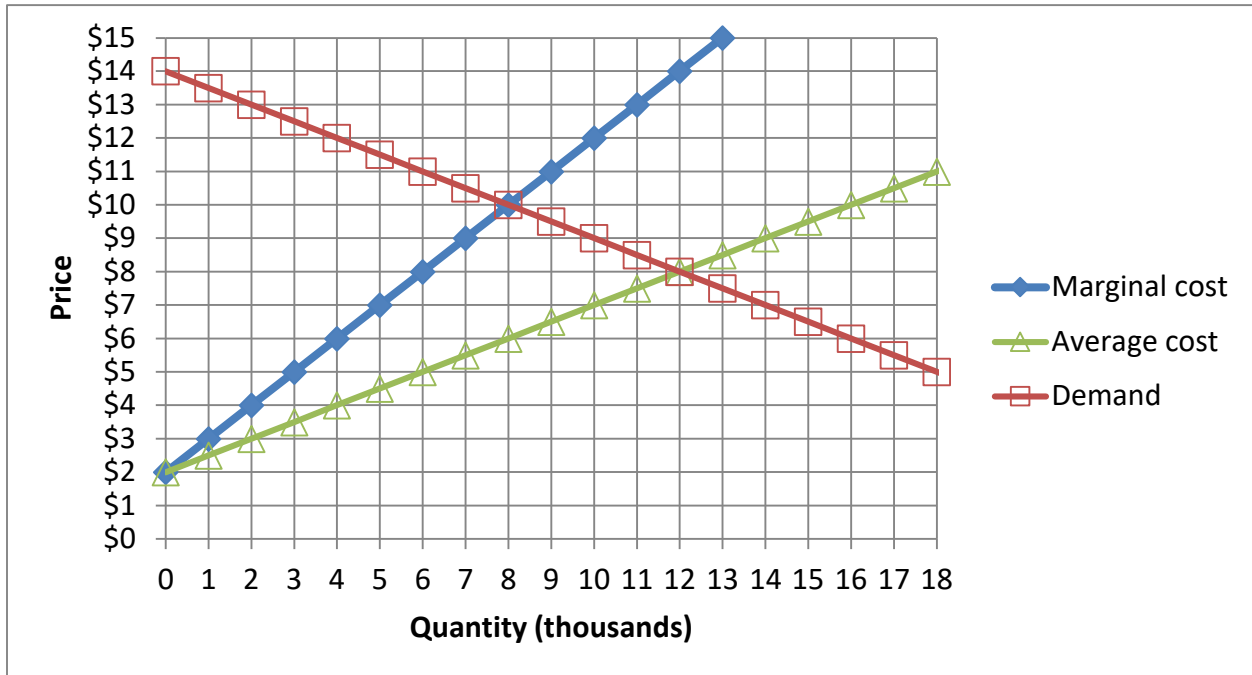
- d. Using a straightedge, draw Becky's budget line in the indifference-curve graph below.



- e. What is **Becky's** opportunity cost of a unit of food?
- f. What is **Becky's** opportunity cost of a unit of clothing?
- g. How many units of clothing will Becky choose to purchase?
- h. At **Becky's** chosen bundle, what is her marginal rate of substitution—that is, the slope of her indifference curve? (Give a number.)

units of clothing
units of food
units of clothing

(3) [Monopoly: 12 pts] Winterland is the only ice rink in the county, so it enjoys a local monopoly. Its marginal cost, average cost, and demand curves are shown below.



Assume that Winterland must charge the same price on every admission sold.

- Using a straightedge, draw and label Winterland's marginal revenue curve.
- Compute Winterland's profit-maximizing quantity.
- Compute the price that Winterland would charge.
- Compute Winterland's profits.
- Compute consumer surplus
- Compute the social deadweight loss.

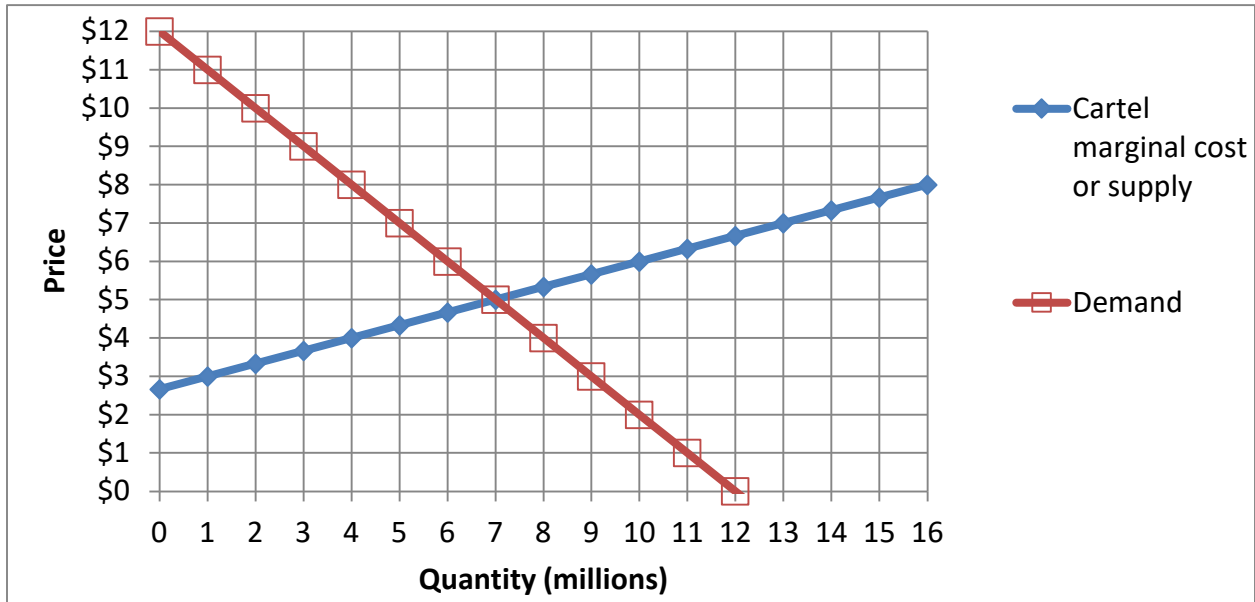
	thousand
\$	
\$	thousand
\$	thousand
\$	thousand

(4) [Monopoly price discrimination: 4 pts] Suppose the local theatre sells tickets to both children and adults. The theatre believes the elasticity of demand by children is -7 , and the elasticity of demand by adults is -3 . Assume the theatre's marginal cost of providing a ticket is \$12.

- Compute the profit-maximizing ticket price for children.
- Compute the profit-maximizing ticket price for adults.

\$	
\$	

(5) [Competition versus collusion: 16 pts] Suppose a small group of firms produce vitamins. The graph below shows the demand curve and the joint marginal cost or supply curve of the group of firms.



First, assume the firms *compete* with each other, each maximizing its own profit while taking the market price as given.

a. What will be the equilibrium market quantity?

	million
b. If output increased by one more unit at any firm, total costs would increase by how much?	\$
c. What will be the equilibrium market price?	\$

Second, alternatively assume the firms *collude* with each other, setting price jointly as a cartel to maximize the sum of their profits.

d. *Using a straightedge*, draw and label the colluding firms' marginal revenue curve.

e. What total quantity will the firms produce?

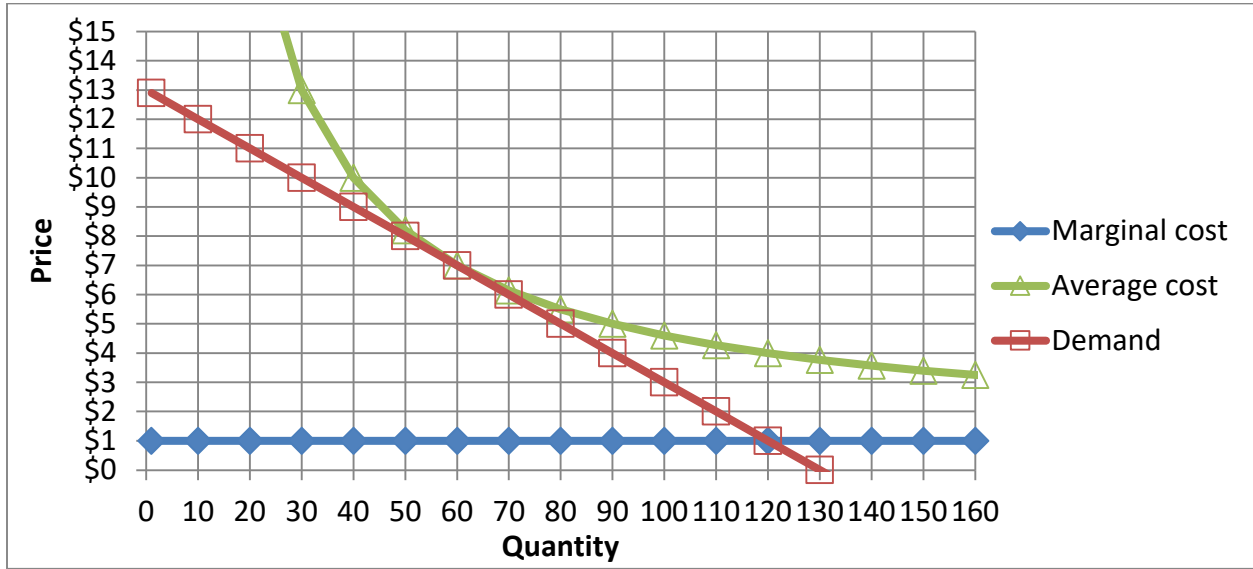
f. If output increased by one more unit at any firm, total costs would increase by how much?

g. What price will the firms jointly set?

h. Compute the social deadweight loss from collusion.

	million
f. If output increased by one more unit at any firm, total costs would increase by how much?	\$
g. What price will the firms jointly set?	\$
h. Compute the social deadweight loss from collusion.	\$ million

(6) [Monopolistic competition: 18 pts] Bob sells sandwiches from a food truck downtown. The graph below shows his cost curves and demand curve.



a. Although there are other food trucks downtown, Bob's demand curve slopes down. Does that indicate that consumers view sandwiches from different trucks as *perfect substitutes* or *differentiated products*?

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First suppose that Bob sets a price of \$10, for some unknown reason.

- b. How many sandwiches will Bob sell?
- c. Will Bob make a *profit* or a *loss* ?
- d. How much?

sandwiches
\$

Now suppose that Bob sets a price to maximize his profit.

- e. *Using a straightedge*, draw and label Bob's marginal revenue curve.
- f. How many sandwiches will Bob sell?
- g. What price will Bob set?
- h. What is Bob's marginal cost?
- i. What is Bob's profit?

sandwiches
\$
\$
\$

[end of exam]