1. Voda Reservoir is a profit-maximizing firm and the only producer of bottled water in a country. Currently, Voda Reservoir is earning negative economic profit.

A. Draw a correctly labeled graph for Voda Reservoir and show each of the following.

i. The profit-maximizing quantity, labeled Q_M

ii. The profit-maximizing price, labeled P_M

iii. The average total cost curve consistent with Voda Reservoir earning negative economic profit, labeled ATC

iv. The area of deadweight loss, shaded completely

B. Suppose the government requires Voda Reservoir to produce the socially optimal quantity of bottled water. On your graph in part A, show the socially optimal quantity of bottled water, labeled Q_S.

C. Suppose instead the government grants a per-unit subsidy to Voda Reservoir. What will happen to Voda Reservoir's profit-maximizing quantity of bottled water? Explain.

D. Suppose new producers have entered the bottled-water market and Voda Reservoir continues to operate in the bottled-water market. Will the demand for Voda Reservoir's bottled water become more elastic, become less elastic, or stay the same as new producers enter the market?

E. Voda Reservoir hires workers in a perfectly competitive labor market.

i. If the demand for bottled water increases, what will happen to Voda Reservoir's demand for labor? Explain.

ii. The government implements a new regulation that increases the minimum age required for a worker to be employed in a bottled-water factory. What will happen to the market wage in the short run? Explain.

1. Arzeye Pharma has a patent, a legal barrier to entry, on its newly developed eye treatment that cures common eye problems. Arzeye Pharma is currently earning positive economic profit and is producing the profit-maximizing quantity of eye treatments.

(a) Draw a correctly labeled graph for Arzeye Pharma and show each of the following.

(i) The profit-maximizing quantity of eye treatments, labeled Q^*
(ii) The profit-maximizing price, labeled P^*
(iii) The average total cost curve consistent with positive economic profit, labeled ATC
(iv) The area representing consumer surplus, shaded completely

(b) Suppose Arzeye Pharma wants to charge a price that maximizes its total revenue rather than its profit.

(i) On your graph in part (a), show the revenue-maximizing quantity, labeled Q_R.
(ii) At quantity Q_R identified in part (b)(i), is the demand for eye treatments elastic, inelastic, or unit elastic?

(c) Suppose now that Arzeye Pharma engages in perfect price discrimination.

(i) On your graph in part (a), show the lowest price that Arzeye Pharma would charge, labeled P_2.
(ii) What would happen to consumer surplus? Explain.

(d) Suppose instead that Arzeye Pharma's patent expires. Will the demand for Arzeye Pharma's treatment become more elastic, become less elastic, or not change? Explain.

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