

1. A firm has a patent on a new carbon-capture technology, making it the only producer of that device. The firm is currently earning a positive economic profit and is producing the profit-maximizing level of output.
- (b) The government is considering different options to regulate the firm.
- (i) Suppose the government is considering taxing the firm. Could using a per-unit tax change the firm's output to the socially optimal quantity? Explain.
 - (ii) Instead, suppose the government imposes a price ceiling so that the firm produces the socially optimal quantity. On your graph in part (a), label the quantity and price after the price ceiling is imposed as Q_C and P_C .
 - (iii) At the price and the quantity identified in part (b)(ii), is the firm earning positive economic profit? Explain.
- (c) Assume the government decides not to regulate the firm and instead the firm produces the quantity of output that maximizes total revenue.
- (i) If the firm now increases its output by one unit, would marginal revenue be positive, negative, or zero? Explain.
 - (ii) Starting at the total-revenue-maximizing quantity, if the firm reduces the price by 10%, would the quantity demanded increase by less than 10%, by more than 10%, or by exactly 10% ?

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.