

# 2004 AP<sup>®</sup> MICROECONOMICS FREE-RESPONSE QUESTIONS

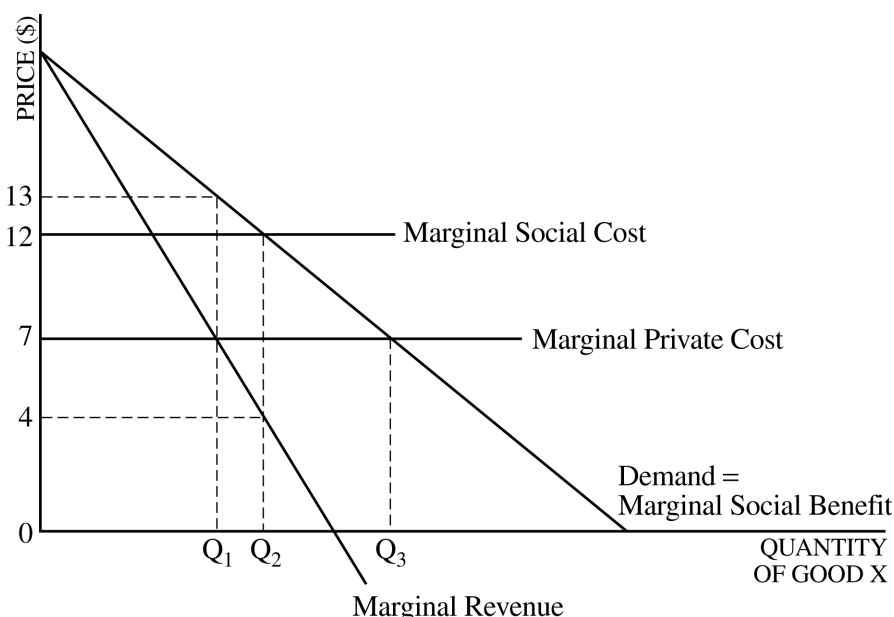
## MICROECONOMICS

### Section II

Planning time—10 minutes

Writing time—50 minutes

**Directions:** You have fifty minutes to answer all three of the following questions. It is suggested that you spend approximately half your time on the first question and divide the remaining time equally between the next two questions. In answering the questions, you should emphasize the line of reasoning that generated your results; it is not enough to list the results of your analysis. Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes.

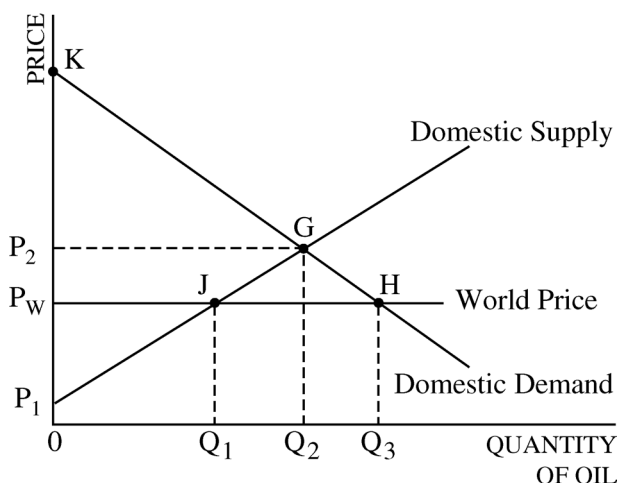


1. The production of good X creates an externality. The following questions are based on the graph above, which shows the marginal revenue, marginal social benefit, marginal private cost, and marginal social cost associated with the production of good X.
  - (a) Is the externality positive or negative? Explain.
  - (b) Using labeling from the graph above, identify the socially optimum output. Explain how you determined your answer.
  - (c) Suppose that good X is produced by a profit-maximizing monopoly. Answer each of the following.
    - (i) Using labeling from the graph above, identify the unregulated firm's output. Explain how you determined your answer.
    - (ii) To produce the socially optimum output, indicate whether the government should tax or subsidize the firm.
    - (iii) Calculate the dollar value of the needed per-unit tax or subsidy.

QUESTION 1 CONTINUES ON PAGE 3.

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- (d) Suppose that good X is produced in a perfectly competitive industry. Answer each of the following.
- Using labeling from the graph on the previous page, identify equilibrium output in the absence of regulation. Explain how you determined your answer.
  - To produce the socially optimum output, indicate whether the government should tax or subsidize the firms in the industry.
  - Calculate the dollar value of the needed per-unit tax or subsidy.
- 



2. The graph above shows the demand for oil by United States residents, the supply of oil by United States producers, and the world price of oil. Use the labeling of the graph to answer the following questions.
- Identify the following before international trade occurs.
    - Price of oil in the United States market
    - Quantity of oil produced in the United States
  - Now assume that the United States begins to import oil at the world market price of  $P_w$ . Identify the quantity imported by the United States.
  - Identify the consumer surplus in the United States market for each of the following cases.
    - Before international trade
    - After international trade
  - Identify the producer surplus in the United States market for each of the following cases.
    - Before international trade
    - After international trade
  - Identify the net gain in total surplus from trade.

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2004 SCORING GUIDELINES**

**Question 1**

**Correct Answer:**

- (a) As shown on the graph,  $MSC > MPC$  indicates the existence of a negative externality.
- (b) The socially optimal quantity is  $Q_2$  because  $MSB = MSC$  at this output level.
- (c) The profit-maximizing quantity is  $Q_1$  because  $MR = MPC$  at this output level. To produce the socially optimum quantity, the government should grant the monopolist a per-unit subsidy of \$3.00.
- (d) The equilibrium quantity for the perfectly competitive industry is  $Q_3$  because  $MPC = D(MSB)$  at this output level. To produce the socially optimal quantity, the government should levy a per-unit tax of \$5.00 on firms in this industry.

**Scoring Guidelines: 12 points** (2+2+4+4)

(a) 2 points:

1 - Identifying negative externality

1 - (Marginal) social cost is higher than (marginal) private cost,  $(M)SC > (M)PC$

\*\*Contingent on negative externality as correct assertion

(b) 2 points:

1 - Identifying  $Q_2$

1 - Marginal social benefit equals marginal social cost ( $D = MSC$  or  $P = MSC$ )

(c) 4 points:

(i) 1 - Identifying  $Q_1$

1 - At  $Q_1$ , marginal private cost equals marginal revenue ( $MPC = MR$  or  $MC = MR$ )

(ii) 1 - Subsidize the firm

(iii) 1 - \$3 per unit

\*\*Contingent on subsidy as correct assertion in (c)(ii)

(d) 4 points:

(i) 1 - Identifying  $Q_3$

1 - Marginal social benefit equals marginal private cost

$D = MPC$  or  $MSB = MPC$

(ii) 1 - Tax the industry

(iii) 1 - \$5 per unit

\*\*Contingent on tax as correct assertion in (d)(ii)