**AP** CollegeBoard

# AP® Microeconomics
## Free-Response Questions
## Set 2

**MICROECONOMICS**
Section II
Total Time—1 hour
Reading Period—10 minutes
Writing Period—50 minutes

**Directions:** You are advised to spend the first 10 minutes reading all of the questions and planning your answers. You will then have 50 minutes to answer all three of the following questions. You may begin writing your responses before the reading period is over. 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. 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. Use a pen with black or dark blue ink.

1. Gigantic Pharmaceutical Corporation has a patent on a prescription drug, making it the only manufacturer of that prescription drug. Gigantic is currently earning a positive economic profit.

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

      (i)   The profit-maximizing quantity, labeled $Q_G$

      (ii)  The profit-maximizing price, labeled $P_G$

      (iii) The average total cost curve, labeled ATC

      (iv)  The area representing the consumer surplus, shaded completely

   (b) Suppose the demand for the prescription drug increases, and Gigantic hires its warehouse workers in a perfectly competitive labor market.

      (i)   What will happen to Gigantic's demand for warehouse workers? Explain.

      (ii)  What will happen to the wage rate Gigantic pays its warehouse workers and the number of warehouse workers it hires?

   (c) After Gigantic's patent expires, another firm enters the prescription drug market and produces an identical drug that sells for a lower price.

      (i)   What will happen to Gigantic's producer surplus?

      (ii)  What will happen to the consumer surplus in this prescription drug market? Explain.
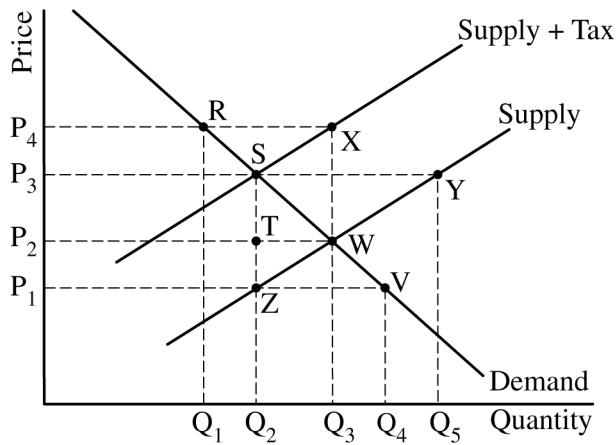
2. Hats are produced in a perfectly competitive industry, and the government imposes a per-unit sales tax on hats.

   (a) Using the labeling from the graph, identify each of the following.

       (i) The after-tax price paid by consumers and the after-tax quantity

      (ii) The area representing the total tax revenue received by the government

   (b) Now assume instead that the demand for hats is perfectly inelastic at $Q_3$, while the supply and the per-unit tax remain unchanged.

       (i) Will the after-tax price paid by consumers be higher, lower, or the same compared to the price in your answer to part (a)(i) ?

      (ii) Will the total tax revenue received by the government be higher, lower, or the same compared to the tax revenue in your answer to part (a)(ii) ? Explain.

   (c) If the demand for hats remains perfectly inelastic at $Q_3$ and the per-unit sales tax is reduced, will producer surplus increase, decrease, or stay the same? Explain.

**Boulevard**

|  | | Delivery | No Delivery |
|---|---|---|---|
| | 6:00 P.M. | $35, $30 | $55, $20 |
| **Jackpot** | | | |
| | 9:00 P.M. | $25, $50 | $45, $40 |

3. Jackpot Florist and Boulevard Gardens share the market for floral bouquets in Tuliptown. Jackpot is deciding whether to close at 6:00 P.M. or to close at 9:00 P.M., and Boulevard is deciding whether to offer Delivery or No Delivery. The payoff matrix above shows the annual profits for each combination of actions that the firms can choose. The first entry shows Jackpot's profit, and the second entry shows Boulevard's profit.

Assume that both firms know all the information in the matrix and act simultaneously and independently.

(a) Is Jackpot's dominant strategy to close at 6:00 P.M., to close at 9:00 P.M., or does it not have a dominant strategy?

(b) Suppose Jackpot chooses to close at 6:00 P.M. and Boulevard chooses No Delivery. Is this the profit-maximizing action by Boulevard? Explain using values from the payoff matrix.

(c) How much profit will Boulevard earn in the Nash equilibrium?

(d) Suppose these two firms merge to form one company with two locations and still face the same actions and payoffs. Which strategies would the new company choose to maximize its combined profit?

(e) Now assume that instead of merging, Jackpot proposes a plan to cooperate with Boulevard. Jackpot would agree to close at 9:00 P.M., and Boulevard would agree to No Delivery. If either firm breaks the agreement, it <u>MUST</u> subtract $12 from its profit that is then added to the other firm's profit.

   (i) Assuming the agreement was in effect and enforced, redraw the matrix, including the players, actions, and payoffs.

   (ii) Assuming Boulevard is a profit-maximizing firm and there are no antitrust concerns, would Boulevard agree to Jackpot's proposal? Explain using specific values from the redrawn payoff matrix.

**STOP**

**END OF EXAM**