# TEST 8  VERSION B
## "Antitrust Policy on Vertical Mergers and Vertical Restraints"

INSTRUCTIONS:  This exam is closed-book, closed-notes.  Simple calculators are permitted, but graphing calculators or calculators with alphabetical keyboards are NOT permitted.  Mobile phones or other wireless devices are NOT permitted.  Points will be subtracted for illegible writing or incorrect rounding.  Point values for each question are noted in brackets.

**I.  Problems:**  Insert your answer to each question below in the box provided.  Feel free to use the margins 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) [Motivations for vertical mergers: 8 pts]  Check one answer to each question below.

   a. Which structure can better reduce inflexibility created by formal contracts?

        [  ] single vertically-integrated firm.                    [  ] two separate firms.

   b. Which structure creates greater incentives for each unit to minimize costs?

        [  ] single vertically-integrated firm.                    [  ] two separate firms.

   c. Which structure can spread the risk of price fluctuations in intermediate goods?

        [  ] single vertically-integrated firm.                    [  ] two separate firms.

   d. Which structure can avoid the problem of "double marginalization"?

        [  ] single vertically-integrated firm.                    [  ] two separate firms.

(2) [Vertical merger of successive monopolies: 52 pts]  Suppose an upstream monopoly company produces operating-system software used by a downstream monopolist to make computers.  The upstream firm has constant marginal cost (equal to average cost) of $MC_S = \$20$.  Each computer requires exactly one copy of the software and $300 of other inputs.  Therefore the downstream computer monopolist has constant marginal cost (equal to average cost) of $300 plus the price of software, $P_S$, which is set by the upstream monopolist.  The key assumptions are

| | |
|---|---|
| Marginal and average cost of software: | $MC_S = AC_S = \$20.$ |
| Marginal and average cost of computers: | $MC_C = AC_C = \$300 + P_S.$ |
| Demand for computers: | $P_C = 600 - Q.$ |

a. [4 pts] Find the equation for the marginal revenue curve for computers.  [Hint:  If demand is linear, marginal revenue has the same vertical intercept, but twice the slope, as the demand curve.]

$$MR_C =$$

Now compare market outcomes under two scenarios:  (i) upstream and downstream markets are both monopolized, and (ii) upstream and downstream are served by a vertically-integrated monopoly.

(i) First suppose both upstream and downstream markets are both monopolized.  This is the scenario of **"successive monopolies."**

b. [4 pts] Find the equation for the derived demand curve for software.  [Hint:  Set the marginal cost of computers equal to $MR_C$ and solve for $P_S$.]

$$P_S =$$

c. [4 pts] Find the equation for the marginal revenue curve for software.  [Hint:  For linear demand curves, marginal revenue has the same vertical intercept, but twice the slope, as the demand curve.]

$$MR_S =$$

Now compute the quantity of software (and thus computers) sold $Q$, the price of software $P_S$, the upstream software monopolist's profit, the price of computers $P_C$, and the downstream monopolist's profit.  Insert your answers in column (i) in the **Table of Results** on the next page.

[Problem continues on next page.]

(ii) Second, assume the upstream and downstream industries are served by a **vertically integrated monopoly**.  The marginal cost of computers for the vertically-integrated monopoly is therefore  **MC = $300 + $20**.

  Now compute the quantity of computers, the price of computers $P_C$, and the integrated monopolist's profit.  Insert your answers in column (ii) of the Table of Results below.

| Table of results [36 pts] | (i) Successive monopolies | (ii) Vertically integrated monopoly |
|---|---|---|
| Q = quantity of software (and computers) | | |
| $P_S$ = price of software | $ | |
| Profit of upstream firm | $ | |
| $P_C$ = price of computers | $ | $ |
| Profit of downstream firm | $ | |
| Total upstream + downstream profits | $ | $ |

(iii) Third, consider the policy implications.

  d. [4 pts]  Suppose initially that both the upstream market (software) and the downstream market (computers) are monopolized.  Then suppose the upstream firm proposed to merge with the downstream firm.  Should the government try to block the merger?  Why or why not?

(3) [Tying,: 28 pts]  Suppose a monopoly software company believes that the representative customers below are willing to pay the following amounts for three programs.

|                       | Word processor | Spreadsheet | Presentation |
|-----------------------|----------------|-------------|--------------|
| Sales representative  | $25            | $50         | $125         |
| Attorney              | $175           | $100        | $25          |
| Accountant            | $50            | $150        | $25          |

Suppose each program were priced separately, and suppose the software company wishes to maximize revenue.

a. What price should the company set for the word-processing program?     $

b. What price should the company set for the spreadsheet program?     $

c. What price should the company set for the presentation program?     $

d. How much revenue would the company receive in total for all three programs and all three customers?     $

Suppose all three programs were bundled and priced as a single "office" software package.  Again assume the software company wishes to maximize revenue.

e. What price should the company set for the *package* of three programs?     $

f. How much revenue would the company receive in total for all three customers?     $

g. Should the company sell the programs *separately* or as a *package*?  (Assume the marginal cost of all programs is zero.)

## II. Critical thinking [12 pts]

Why might a luxury handbag company insist that all retail stores charge a *minimum* price for its handbags? Give the most plausible explanation.

[end of quiz]