

ĐẠI HỌC QUỐC GIA HÀ NỘI  
TRƯỜNG ĐẠI HỌC KINH TẾ

Cộng hòa xã hội chủ nghĩa Việt Nam  
Độc lập – Tự do – Hạnh phúc

ĐỀ THI KẾT THÚC HỌC PHẦN  
KINH TẾ VI MÔ CHUYÊN SÂU INE2101E  
ĐỀ SỐ 3 (CODE 3)

Thời gian làm bài: 120 phút

*Không sử dụng tài liệu*

**Question 1. 30 points**

Victoria's preferences for lipsticks ( $x_1$ ) and bags ( $x_2$ ) are represented by the following utility function:

$$U(x_1, x_2) = 5x_1^{\frac{2}{3}}x_2^{\frac{1}{3}}$$

- Derive the demand function for lipsticks and bags as the functions of price of a lipstick ( $p_1$ ), price of a bag ( $p_2$ ) and income ( $m$ )? What is fraction of income spent on bags? (15 points)
- Suppose the price of a lipstick is  $p_1 = \$8$ , and the price of a bag is  $p_2 = \$5$  and her income is  $m = \$120$ . Find the optimal consumption level of lipsticks and bags. (15 points)

**Question 2. 20 points**

*Cost production:*

- Consider production function given by  $Y = F(x, y) = 5x^2y^2$

Does this exhibit constant, increasing, or decreasing returns to scale? (10 points)

- The technical rate of substitution between factors  $y$  and  $x$  is -4. If you desire to produce the same amount of output but cut your use of  $x$  by 3 units, how many more units of  $y$  will you need? (10 points)

**Question 3. 20 points**

Consider a market with demand function  $P = 150 - 10Q$  for only one firm with constant  $MC = 5$ .

- Calculate the deadweight loss of this monopolist? Draw the graph (10 points)
- If this market has one more firm, with the demand function  $P = 150 - 10Q$  (where

$Q = Q_1 + Q_2$ ) and two firms with constant  $MC = 5$ ,  $TFC = 0$ . Find the Nash (Cournot) equilibrium profit per firm. (10 points)

**Question 4. 30 points**

For each of the following questions, state True or False and explain briefly.

- A natural monopoly occurs when a firm cannot operate at an efficient level of output without losing money. Many public utilities are natural monopolies of this sort and are therefore regulated by the government. (10 points)
- Pareto efficiency is an economic state where resources cannot be reallocated to make one individual better off without making at least one individual worse off. (10 points)
- As long as the welfare function is increasing in each individual's utility, a welfare maximum will be Pareto efficient. Furthermore, every Pareto efficient allocation can be thought of as maximizing some welfare function. (5 points)
- In a Robinson Crusoe economy, the firm's isoprofit line is an upward sloping curve with the intercept equals the profit  $\pi$  and the slope equals the wage rate  $\omega$ . (5 points)