

## **Instructions**

- (1) Please read the instruction carefully. Also take this habit with you into the exam room.
- (2) Please read each question carefully and answer the questions straightforwardly. Always provide economic reasons at least a paragraph for your analysis, or a graph when necessary, even when the question does not indicate so.
- (3) Handing and submitting assignments are only available via BE Moodle.

## **Answering the questions and preparing answer sheets**

- (1) Answers are to be handwritten, in either digital or analog form, in a blank canvas or any clean paper. Make sure that your handwriting is clearly visible and readable.
- (2) There is no need to rewrite the question. Just indicate the question number clearly for each of the answer, such as 1.a).
- (3) When done, for the digital case, collage all the pages into a single PDF file. For those who write on sheets of paper, take photo of all pages then convert all of them into a single PDF file as well.
- (4) **Name your PDF file as StudentID\_YourNickname, such as 640123456\_Bo.**

## **Submitting your answers**

- (1) Make sure your file does not exceed 10MB. This is the maximum file size for BE Moodle upload.
- (2) Login to BE Moodle, head into the course, then the assignment topic.
- (3) Choose your file to submit. Done. There will be timestamp for your upload date and time, so please make sure to not submit later than that.

## Assignment 3

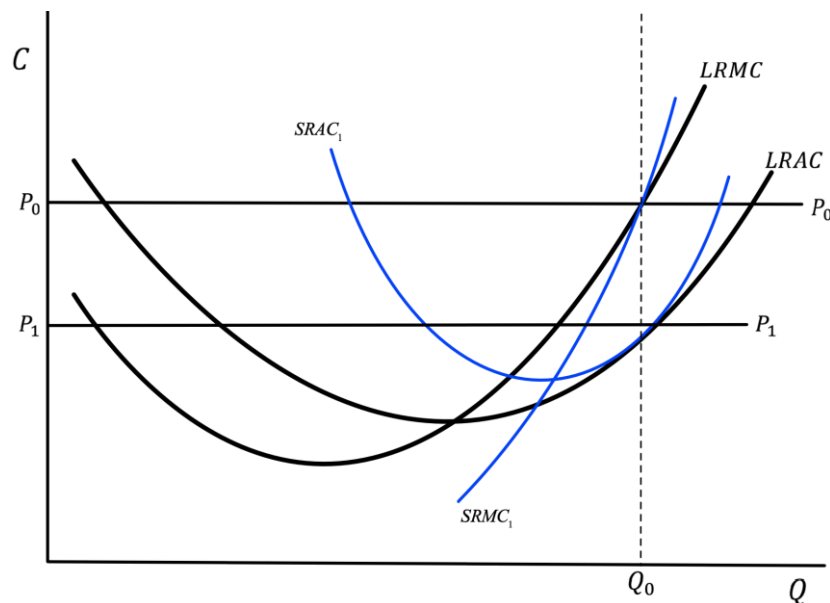
Assigned on Nov 9<sup>th</sup>, 2021. To be submitted on Nov 18<sup>th</sup>, 2021 before midnight.

1. Two COVID-19 vaccines are available in Thailand, Sinovac and Pfizer priced at  $P_x$  and  $P_y$  respectively. Assumed that both vaccines are substitutes, answer the following questions clearly.

1.a) Draw a budget line for these two when a consumer has \$40 and indicate all the essential information on the graph, given that Sinovac is displayed on the horizontal axis while Pfizer is on the vertical axis.

1.b) If a consumer sees that Sinovac is an inferior good while Pfizer is a normal good and Sinovac price is slashed by a half, analyze how consumer's equilibrium changes disaggregating price effect into substitution effect and income effect and explain.

2. In a perfectly competitive market, suppose that every firm is in a long-run equilibrium where each firm receives an excess profit at a market equilibrium price  $P_0$  and produces  $Q_0$  as shown in the graph below.

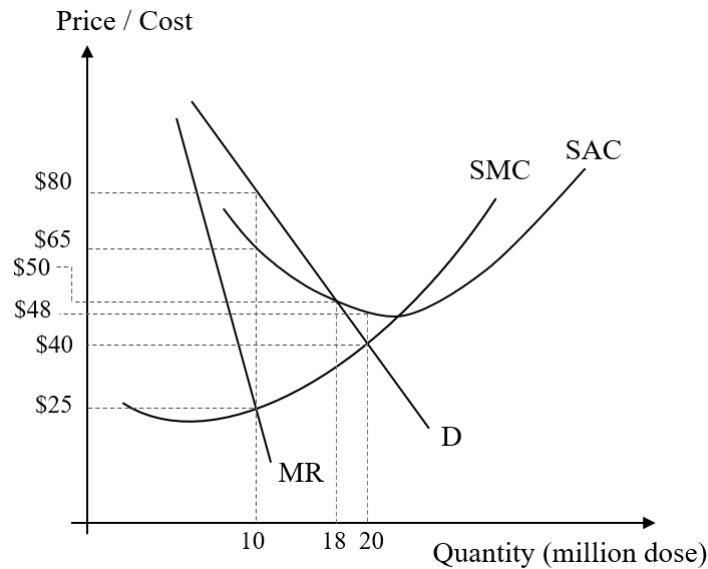


2.a) If the market equilibrium price decreases to  $P_1$ , in the short run according to the given Short-Run cost curves  $SRAC_1$  and  $SRMC_1$ , find the new Short-Run equilibrium quantity  $Q_1$  and profit of the firm. State the equilibrium conditions.

2.b) Show that at the new Short-Run equilibrium quantity  $Q_1$ , the profit earned according to the Long-Run cost curves  $LRAC$  at  $Q_1$  and price  $P_1$  is higher than the profit in Short-Run found in 2.a).

2.c) According to the Long-Run cost curves  $LRAC$  and  $LRMC$ , find the equilibrium quantity the firm wants to produce at the new lower price  $P_1$ , when there is no new seller entering the market. State the equilibrium conditions.

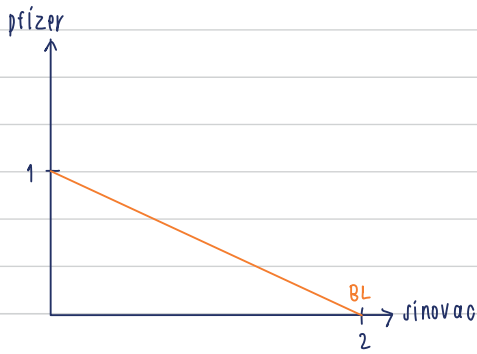
3. Thai government decides to import vaccines from J&J through the Government Pharmaceutical Organization (GPO). Supposed that **GPO can act as a private monopoly firm**, demand, revenue and cost of importing are displayed in the following graph in USD. Note that a single dose of J&J vaccine is sufficient to immunize COVID-19. Answer the following questions clearly.



- 3.a) If GPO wants to maximize profit, how many million doses should they import and at which price can be sold for each dose?
- 3.b) According to 3.a), how much is the total profit that GPO receives in million USD?
- 3.c) If the government decides to intervene and set a fair price, how many million doses GPO needs to import and how much the price to be set?
- 3.d) To achieve herd immunity with a new strategy, the target number of people privately vaccinated is 20 million people. How much for a dose that each person pays for the vaccine and how much does the government should subsidize in total?

\*\*\*\*\*

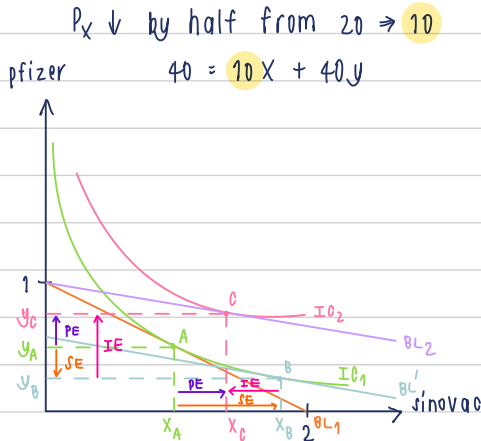
1. a



$$BL : I = P_x X + P_y Y$$

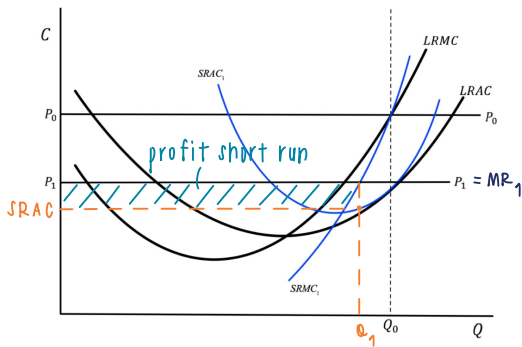
$$40 = 20X + 40Y$$

1. b



- > in Substitution effect : when price of sinovac decrease, consumers will increase sinovac and substitute by decrease pfizer in order to maintain their constant utility (A  $\rightarrow$  B)
- > in Income effect : when price of sinovac decrease, purchasing power will increase from BL' to BL<sub>2</sub>  $\therefore$  consumers will decrease sinovac as an inferior goods, and increase pfizer as a normal goods. (B  $\rightarrow$  C)
- > in Price effect : when price of sinovac decrease, consumers will increase sinovac as an ordinary goods (A  $\rightarrow$  C)

2. a

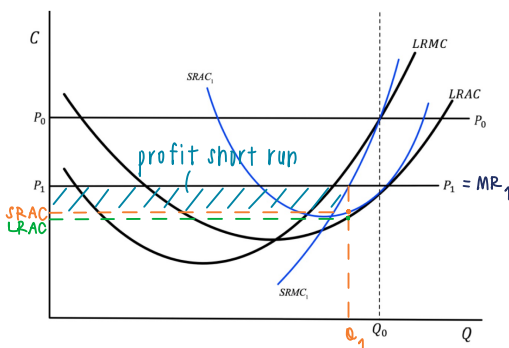


$$\text{Max } \pi : MR = MC$$

$$P_1 = SRAC_1$$

$$\pi_{SR} = (P_1 - SRAC_1) \cdot Q_1^*$$

2. b



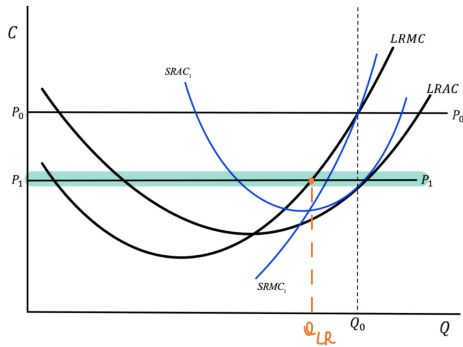
$$\pi_{SR} = (P_1 - SRAC_1) \cdot Q_1$$

$$\pi_{LR} = (P_1 - LRAC) \cdot Q_1$$

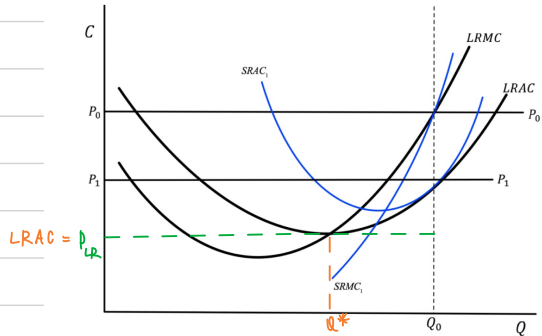
$$LRAC < SRAC$$

$$\therefore \pi_{LR} > \pi_{SR}$$

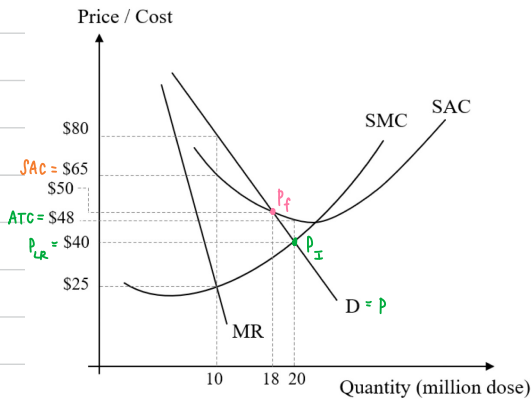
2 c



$Q_{LR}$  is equilibrium quantity ( $Q^*$ ) at long run  $P_1$



$Q^*$  when there is no new seller entering



$$P_I \Rightarrow P = MC$$

$$P_f \Rightarrow P = ATC$$

3. a  $Q_m^* = 10$  million doses  
 $P_m^* = \$80$  per doses

3. b  $\pi = (80 - 65) \times 10 = \$150$  million

3. c  $Q_m^* = 18$  million doses  
 $P_m^* = \$50$  per doses

3. d if government need  $Q^* = 20$  million doses, monopoly faces loss since  $ATP > P_I^*$   
 ∴ Gov must subsidize that loss in order to create incentive for monopoly to produce

$$\begin{aligned} \text{subsidize} &= (ATC - P) Q^* \\ &= (48 - 40) \times 20 \\ &= \$160 \text{ million.} \end{aligned}$$