

## **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.

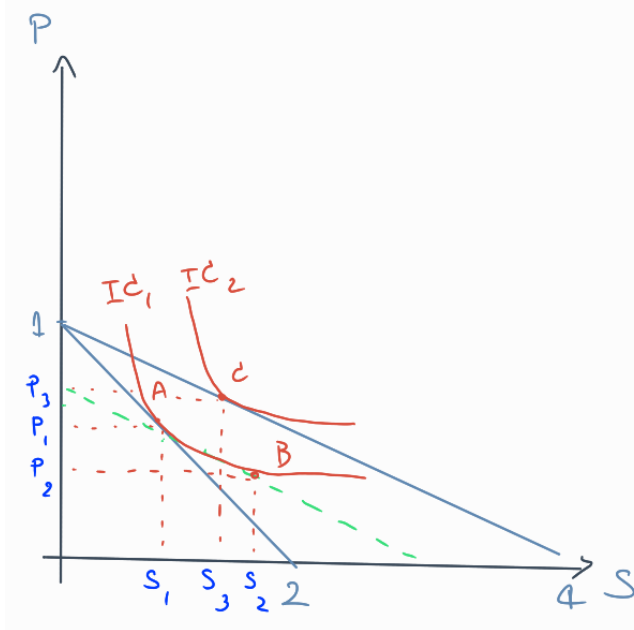
## **Answering the questions and preparing answer sheets**

- (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.

1. Two COVID-19 vaccines are available in Thailand, Sinovac and Pfizer priced at \$20 and \$40 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.

Budget line is drawn from two intercepts. The intercepts can be found by taking total budget divide by price of each product. The correct budget line should be as the lower-blue one with 1 Pfizer and 2 Sinovac indicated.

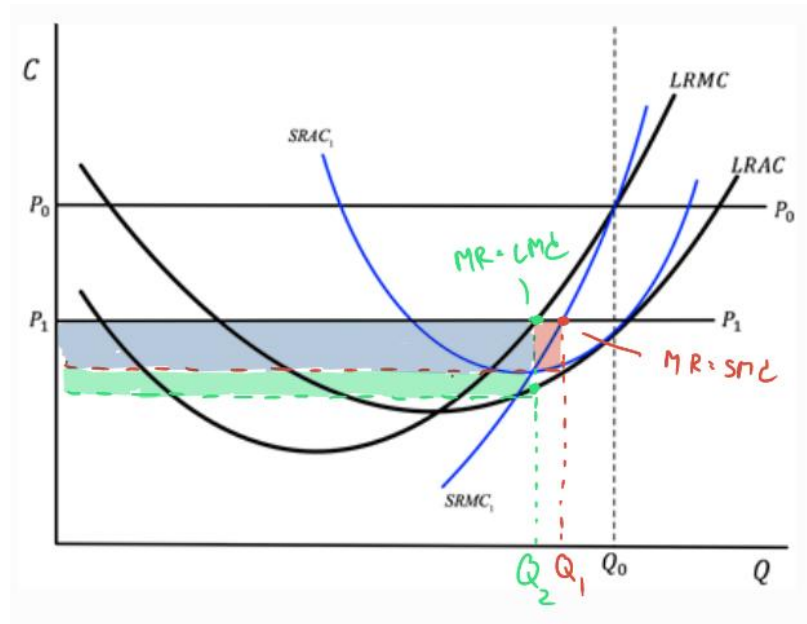
1.b) If a consumer sees that Sinovac is an inferior good while Pfizer is a normal good and Sinovac price is slashed by a half, analyze how consumer's equilibrium changes disaggregating price effect into substitution effect and income effect and explain.

You can see the explanation in class lecture with the illustration above. This is the exact same analysis we did in class.

## Assignment 3

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

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.

When price is lower to  $P_1$ , the profit maximization condition is  $P_1 = MR_1 = SRMC_1$  in **the short-run** (the red condition). The optimal quantity is at  $Q_1$  as illustrated. Excess profit gained is the blue and red block combined.

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).

We can prove this from the characteristics of SMC and SAC. We know that SMC intersects with SRAC at its lowest point. Therefore,  $Q_1$  exceeds the lowest point of SRAC, the cost on LRAC must be lower than SRAC.

In other words, we know that LRAC envelopes multiple SRACs, thus, SRAC can never be lower than LRAC.

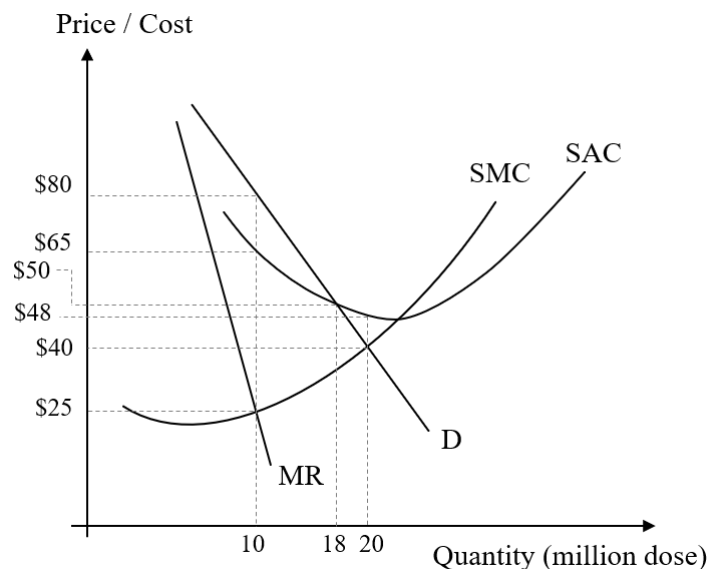
## Assignment 3

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

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.

If this firm is in **the long-run**, profit maximization condition is  $P_1 = MR_1 = LRMC_1$  (the green condition). Excess profit can still be gained since there is no new-entry at this point, the blue and green block combined.

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?

Profit maximization condition is when  $MR=MC$ , then, from the graph we can see that when  $MR=MC$ ,  $Q^* = 10$  million doses.  $P$  will be set according to the demand line, therefore,  $P = \$80$  per dose.

3.b) According to 3.a), how much is the total profit that GPO receives in million USD?

When  $P = \$80$ , at  $Q^*=10$  million doses,  $SAC=\$65$ , therefore, profit is \$15 per unit.

Total profit is  $\$15 \times 10$  million doses = **\$150 million**.

---

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?

Fair price is set when  $P = AC$ , then,  $P = AC = \$50$ .

Total doses imported corresponding to the price is **18 million doses**.

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**?

To import 20 million doses, each person pays **\$40**.

As we can see that when  $P = MC = \$40$ , it is below SAC or price is under cost per unit. GPO has net loss of  $(48-40) \times 20$  million doses = **\$160 million**. This is how much the government should subsidize.

\*\*\*\*\*