Microeconomics In-class Quiz 3
Fall 2025

Student ID:

Name:

Instructions

1. Do NOT flip over this page until every student receives this quiz. Your TA will let you know when you can start.
2. During this closed-book quiz, you cannot consult any materials.
3. If you are unable to explain your reasoning in English, it is okay to write in Korean.
4. [**IMPORTANT**] Make your answers legible. Clearly delineate your scratches from your answers. Deducted points due to illegible writing cannot be the reason for reevaluation.

Honor Code: Cheating on exams or quizzes, plagiarizing someone else's answers as one's own, or any other instance of academic dishonesty violates the standards of academic integrity.

Confidentiality Code: Sharing the information of the exam or quiz contents with other students in any form and medium is strongly prohibited, as it raises information inequity.

I, _____, consent to the Honor Code and the Confidentiality Code.
(write your name)

1. A museum plans to have a special exhibition event. The event manager estimates the demand for Adults to be $q^{Ad} = 600 - 10p$, and demand for Students to be $q^{St} = 900 - 20p$. The manager considers charging different entry fees for two groups. The marginal cost of additional visitor is 10.

(a) [1 point] Derive the inverse demand functions for Adults and Students, and the marginal revenue functions for them.

(b) [1 point] Find the profit-maximizing price and ticket sales for each group.

(c) [2 points] The government mandates that the museum has to charge the same price for everyone. The aggregate demand is given as follows:

$$Q = \begin{cases} 1500 - 30p & \text{if } p \leq 45 \\ 600 - 10p & \text{if } p > 45 \end{cases}$$

In this situation, find the profit-maximizing price and sales.

2. Alice and Ben play a simultaneous-move game described as follows:

		Ben		
		Left	Middle	Right
Alice	Top	6, 2	6, 5	7, 3
	Middle	3, 6	4, 6	2, 7
	Bottom	9, 1	5, 2	3, 6

(a) [1 point] What would be Ben's payoff when she plays *Top* and Ben plays *Middle*?

(b) [1 point] Does either player have a strictly dominant strategy? If so, identify it.

(c) [1 point] Determine whether the game is dominance solvable. If yes, state the unique outcome that results from iterated elimination of strictly dominated strategies. If not, explain why.

3. [1 point each] Examine if there are pure-strategy Nash equilibria in each game, and if so, describe them all.

(a)		Harry	
		Seattle	Vancouver
Sally	Seattle	6, 6	1, 2
	Vancouver	3, 2	5,5

(b)		40s	
		Straight	Baggy
20s	Cargo	40, 60	90, 10
	Slim	70, 30	25, 75

(c)		Channel 2		
		Trot	Pop	Metal
Channel 1	Trot	2, 4	5, 1	4, 5
	Pop	4, 7	4, 5	2, 6
	Metal	5, 5	8, 6	3, 3

(d)		Taylor			
		North	East	South	West
Jordan	North	2,2	0,1	-1,0	1,3
	East	3,0	2,2	1,1	0,0
	South	4,1	3,3	2,2	1,0
	West	1,-1	0,0	-1,-2	-2,-2

4. An airline considers offering two ticket classes: Economy and Business. There are two equally-populated traveler types—Leisure and Corporate—with the following willingness to pay:

	Economy	Business
Leisure	\$300	\$400
Corporate	\$350	\$700

The airline wants Leisure travelers to take Economy and Corporate travelers to take Business.

(a) [1 point] If Economy is priced at \$300 and Business at \$680, is this incentive compatible?

(b) [1 point] If Economy is priced at \$280 and Business at \$650, is this incentive compatible?

(c) [2 points] If the airline fixes Economy at \$290, what is the highest Business price consistent with incentive compatibility? Assume that Corporate travelers choose Business when indifferent.

5. Two coffee producers, Brazil (B) and Colombia (C), dominate the global specialty coffee market. The inverse demand for specialty coffee is given by $P = 600 - 3Q$, where $Q = q_b + q_c$ is the total amount supplied. Each producer has a constant marginal cost of \$60.

(a) [2 points] Given that Colombia produces q_c, find Brazil's best response function (reaction curve).

(b) [2 points] Compute the Cournot–Nash equilibrium quantities for each producer. What is the total quantity in equilibrium?

(c) [2 points] Suppose Brazil moves first and Colombia follows. Find the Stackelberg equilibrium total output.

(d) [2 points] If Colombia exits the market and Brazil becomes a monopolist, what would be the monopolist's optimal output? Compare with your answer from part (b).