



Beijing-Dublin International College



SEMESTER II FINAL EXAMINATION - 2021/2022

ECON1002J Principles of Microeconomics

College of Economics & Management
Prof. Huizheng Liu

Time Allowed: 95 minutes

Instructions for Candidates

The distribution of marks in the right margin shown as a percentage gives an approximate indication of the relative importance of each part of the question.

BJUT Student ID: _____ **UCD Student ID:** _____

I have read and clearly understand the Examination Rules of both Beijing University of Technology and University College Dublin. I am aware of the Punishment for Violating the Rules of Beijing University of Technology and/or University College Dublin. I hereby promise to abide by the relevant rules and regulations by not giving or receiving any help during the exam. If caught violating the rules, I accept the punishment thereof.

Honesty Pledge: _____ **(Signature)**

Instructions for Invigilators

Non-programmable calculators are permitted.
No rough-work paper is to be provided for candidates.

Obtained score

Question 1: Interpretation (4 points per item, total 20 points)

1. Producer Surplus
2. Monopolistic Competition
3. Price Elasticity of Demand
4. The Production Possibility Frontier
5. Marginal Revenue

Obtained score

Question 2: Single Choice (1 point per item, total 50 points)

- 1) Refer to Table 1. Which of the following statements is *true*? 1) _____
- A) Pete has a comparative advantage in avatar design, and Molly has a comparative advantage in tattoo design.
- B) Molly has a comparative advantage in both avatar design and tattoo design.
- C) Molly has a comparative advantage in avatar design, and Pete has a comparative advantage in tattoo design.
- D) Pete has a comparative advantage in both avatar design and tattoo design.

Table 1

	Molly	Pete
Avatar Design product in 1 day	6	10
Tattoo Design product in 1 day	3	2

- 2) The law of _____ implies that as prices fall, _____. 2) _____
- A) demand; demand falls B) supply; supply increases
- C) demand; quantity demanded increases D) demand; demand increases
- 3) Which of the following will NOT cause a shift in the demand curve for DVDs? 3) _____
- A) a change in wealth B) a change in the price of DVDs
- C) a change in income D) a change in the price of Blu-ray discs

Refer to the information provided in Figure 1 below to answer the questions that follow.

- 4) Refer to Figure 1. If consumer income decreases, the demand for chili peppers shifts from D_0 to D_1 . This implies that chili peppers are a(n) 4) _____
- A) complementary good. B) substitute good.
- C) normal good. D) inferior good.

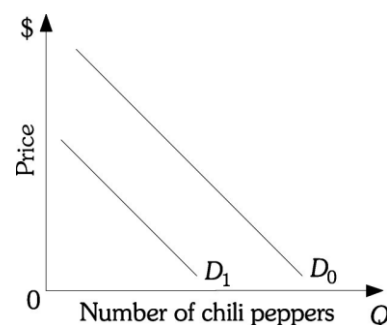


Figure 1

- 5) The concept of trade-offs would become irrelevant if 5) _____
- A) scarcity were eliminated. B) poverty were eliminated.
C) capital were eliminated. D) we were dealing with a very simple, one-person economy.

- 6) According to Figure 2, as the economy moves from Point A to Point E, the opportunity cost of motorcycles, measured in terms of hybrid cars, 6) _____

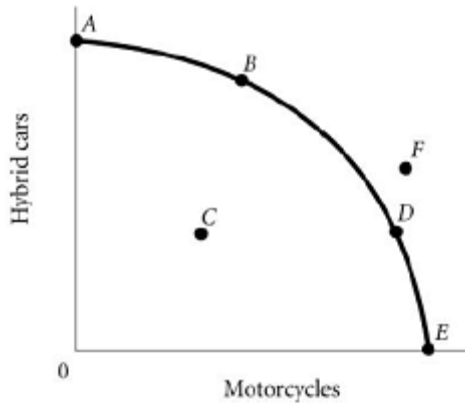


Figure 2

- A) initially increases, then decreases. B) increases.
C) decreases. D) remains constant.
- 7) Demand determines _____ entirely when _____ is perfectly inelastic.
- A) price and quantity; supply B) price and quantity; demand
C) price; supply D) quantity; supply

Refer to the information provided in Figure 3 below to answer the questions that follow.

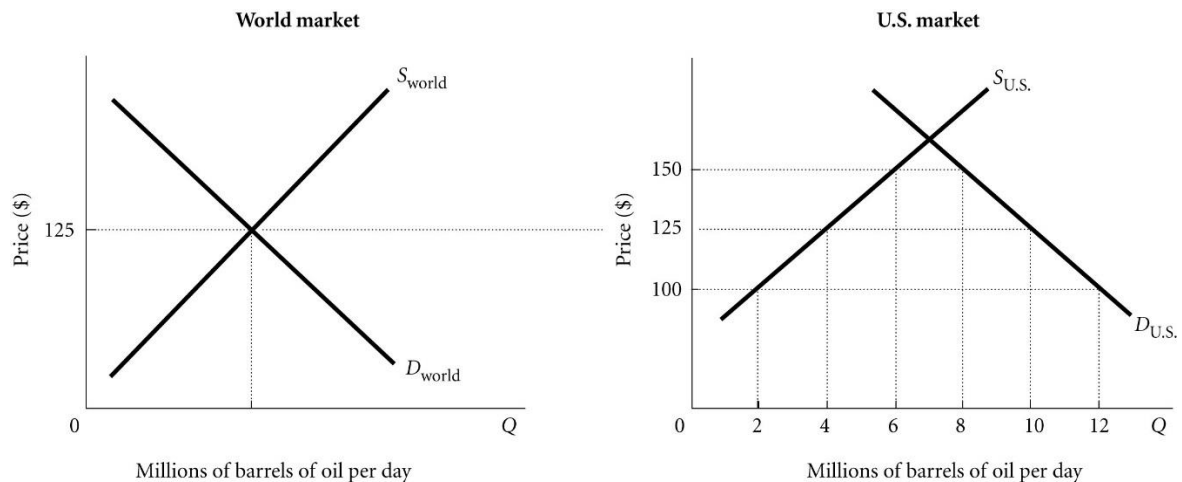


Figure 3

- 8) Refer to Figure 3. At the world price of _____ per barrel of oil, the United States imports 6 million barrels of oil per day. 8) _____
- A) \$100 B) \$125 C) \$150 D) >\$150
- 9) Refer to Figure 3. Assume that initially there is free trade. Tax revenue of \$ 50 million per day will be generated if the United States imposes a _____ tax per barrel on imported oil. 9) _____
- A) \$25 B) \$50 C) \$100 D) \$150

- 10) Refer to Figure 3. Assume that initially there is free trade. If the United States allowed drilling for more oil in the Gulf of Mexico, it could 10) _____
- A) decrease the demand for domestic oil.
 B) increase the domestic price of oil.
 C) reduce the supply of domestic oil.
 D) reduce U.S. oil imports without a tax.
- 11) If income decreases by 20% and, in response, the quantity of housing demanded decreases by 14%, then the income elasticity of demand for housing is 11) _____
- A) 1.43 B) 0.7 C) -1 D) -0.7
- 12) Assume you earn \$75,000 a year and your favorite entertainment magazine costs you \$25 a year. Your demand for the entertainment magazine is likely to be 12) _____
- A) inelastic. B) elastic. C) perfectly elastic. D) perfectly inelastic.
- 13) Carlos can buy either sushi or eggrolls. If the prices of sushi and eggrolls triple and Carlos's money income doubles, we can deduce that Carlos's budget constraint will 13) _____
- A) shift out but remain parallel to the old one.
 B) shift in but remain parallel to the old one.
 C) remain unchanged.
 D) swivel in so that the slope of the budget constraint is doubled.
- 14) An assumption underlying indifference curve analysis is that MU_x/MU_y _____ as less of X and more of Y is consumed. 14) _____
- A) always equals one B) increases C) remains constant D) decreases

Refer to the information provided in Figure 4 below to answer the questions that follow.

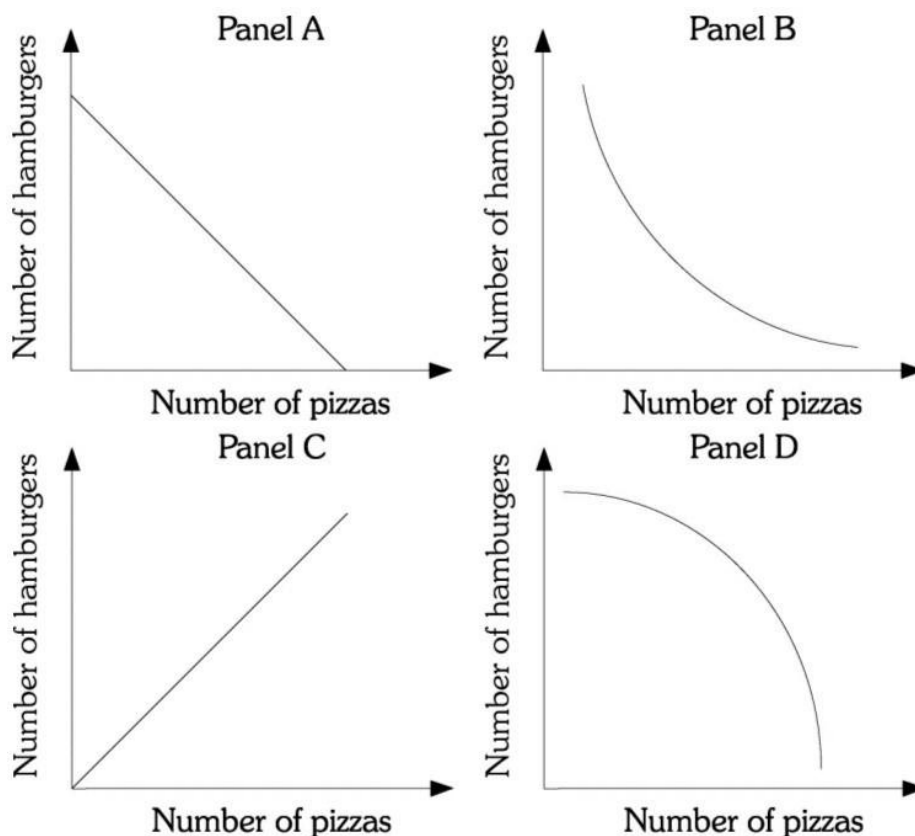


Figure 4

15) Refer to Figure 4. Assume Megan has two products available, pizza and hamburgers. Megan is always willing to trade one hamburger for one pizza regardless of how many pizzas and hamburgers she has. The curve in Panel _____ represents her indifference curve. 15) _____

- A) A B) B C) C D) D

16) Refer to Figure 4. Assume Megan has two products available, pizza and hamburgers. Megan must be compensated with more hamburgers as she gives up more pizzas. The curve in Panel _____ represents her indifference curve. 16) _____

- A) A B) B C) C D) D

17) The Wax Works sells 500 candles at a price of \$10 per candle. The Wax Works' total economic costs for producing 500 candles are \$2,000. The Wax Works' economic profit is 17) _____

- A) \$2,000. B) \$3,000. C) \$5,000. D) indeterminate from this information.

18) The main decision for a profit maximizing perfectly competitive firm is 18) _____

- A) price to charge. B) total cost to achieve
C) total revenue to achieve D) what level of output to produce.

19) In perfect competition, a firm's _____ curve is horizontal. 19) _____

- A) total revenue B) marginal cost C) total cost. D) marginal revenue

Refer to Scenario 1 below to answer the questions that follow.

SCENARIO 1: Tom borrowed \$80,000 from his parents to open a donut stand. He agrees to pay his parents a 5% yearly return on the money they lent him. His other yearly fixed costs equal \$16,000. His variable costs equal \$60,000. He sold 50,000 dozen donuts during the year at a price of \$3.00 per dozen.

20) Refer to Scenario 1. Tom's total fixed costs equal 20) _____

- A) \$4,000. B) \$16,000. C) \$20,000. D) \$80,000.

21) Refer to Scenario 1. Tom's profit is 21) _____

- A) \$0. B) \$30,000. C) \$50,000. D) \$70,000.

22) Assume the Pyrotechnica Fireworks Company hires three inputs: labor (L), capital (K), and land (A) to produce fireworks (X). Which of the following conditions must be met so that the firm is using the optimal, or least costly, combination of inputs? 22) _____

- A) $MP_L = MP_K = MP_A$ B) $MP_L/P_L = MP_K/P_K = MP_A/P_A$
C) $MP_L = MP_K = MP_A = 1/P_X$ D) $P_L = P_K = P_A$

23) If the interest rate is 5%, the current market value of \$1 to be delivered in one year is 23) _____

- A) \$0.91. B) \$0.95. C) \$1.00. D) \$1.10.

24) XYZ Computer Company has a monopoly on the sale of a specialized color printer. If it sells two of these printers, its total revenue is \$1,000, and if it sells three, its total revenue is \$1,300. The marginal revenue of the third color printer sold is 24) _____

- A) \$100. B) \$150. C) \$300. D) \$1,300.

25) When a monopolist sells two units of output, its total revenue is \$150. When it sells three units of output, its total revenue is \$180. When the monopolist sells three units of output, the price per unit is

25) _____

- A) \$50. B) \$60. C) \$75. D) \$90.

- 26) When the price of oysters decreases 25%, quantity demanded is unchanged. The price elasticity of demand for oysters is 26) _____
 A) unitary elastic. B) elastic. C) inelastic. D) perfectly inelastic.

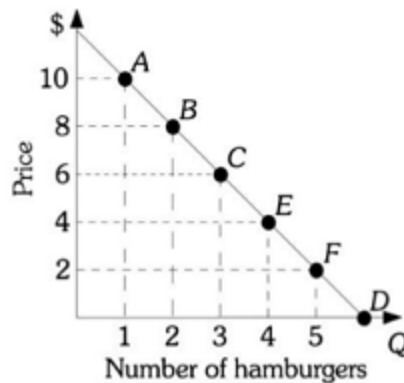


Figure 5

- 27) Refer to Figure 5. If the price of a hamburger decreases from \$4 to \$2, the price elasticity of demand equals _____. Use the midpoint formula.

A) -0.33 B) -2.0 C) -3 D) -5.0

- 28) Refer to Table 2. Assume that a store is giving hamburgers and sodas away for free. Consumers can have as many sodas and hamburgers as they want, but the food has to be consumed one unit at a time. If George has already had one soda and two hamburgers, then George should 28) _____

A) next consume a soda to maximize his utility.
 B) be indifferent between consuming the second soda or the third hamburger.
 C) next consume a hamburger to maximize his utility.
 D) consume neither another soda nor another hamburger to maximize his utility.

Table 2

Number of Hamburgers per Day	Total Utility	Marginal Utility
1	30	
2	52	
3	67	
4	76	
5		4
Number of Sodas per Day	Total Utility	Marginal Utility
1	20	
2	35	
3	47	
4	57	
5		7

Refer to the information provided in Table 3 below to answer the question that follows.

Table 3
B's Strategy

		Advertise	Don't Advertise
A's Strategy	Advertise	A's profit \$200 million	A's profit \$400 million
		B's profit \$200 million	B's profit \$100 million
	Don't	A's profit \$100 million	A's profit \$150 million
		Advertise	B's profit \$400 million
	Advertise	A's profit \$100 million	A's profit \$150 million
		B's profit \$400 million	B's profit \$150 million

- 29) Refer to Table 3. Firm A's dominant strategy is 29) _____
 A) dependent on what Firm B does.
 B) to not advertise.
 C) to advertise.
 D) indeterminate from this information, as no information is provided on Firm A's risk preference.

- 30) Refer to Table 3. What is the Nash equilibrium in the game? 30) _____
 A) (Advertise, Advertise) B) (Don't Advertise, Advertise)
 C) (Advertise, Don't Advertise) D) (Don't Advertise, Don't Advertise)

- 31) Refer to Table 3. If both firms follow a maximin strategy, the equilibrium is _____. 31) _____
 A) (Don't Advertise, Don't Advertise) B) (Advertise, Don't Advertise)
 C) (Don't Advertise, Advertise) D) (Advertise, Advertise)

- 32) The demand facing a monopolistically competitive firm is _____ a perfectly competitive firm and _____ a monopolistic firm. 32) _____
 A) more elastic than; as elastic as
 B) more elastic than; less elastic than
 C) less elastic than; more elastic than
 D) as elastic as; less elastic than

Refer to the information provided in Figure 6 below to answer the questions that follow.

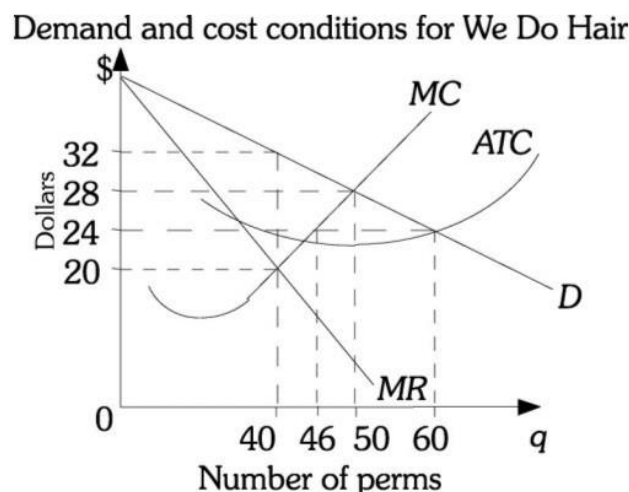


Figure 6

- 33) Refer to Figure 6. The ____ quantity of perms for We Do Hair, a monopolistically competitive firm, is 40. 33) _____
 A) breakeven B) shut down C) profit-maximizing D) loss-minimizing
- 34) Refer to Figure 6. From society's viewpoint, the _____ level of output is 50 perms. 34) _____
 A) monopoly level B) efficient level C) shut down D) minimum level
- 35) Harry tells you that he prefers Pepsi to Coke, Coke to 7-UP, and 7-UP to Pepsi. This violates what assumption made when analyzing consumer preferences?
 A) that consumers are rational
 B) that consumers are able to choose among all the combinations of goods and services available
 C) that more is better
 D) that there is a diminishing marginal rate of substitution

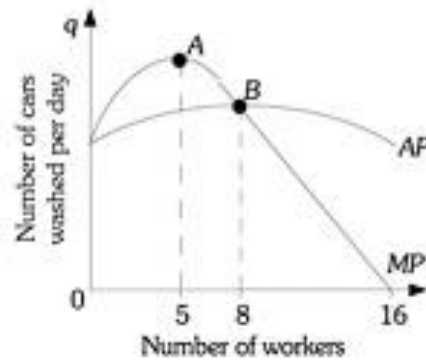


Figure 7

36) Refer to Figure 7. Diminishing marginal returns set in after the _____ worker is hired.

- A) first B) fifth C) eighth D) sixteenth

37) If the marginal product of labor is less than the average product of labor, then the

- A) marginal product must be increasing.
 B) average product must be decreasing.
 C) marginal product must be decreasing.
 D) Both B and C

38) The version of the law of diminishing returns that applies to production

- A) implies that as we add more workers our output decreases.
 B) is true only when all inputs are variable.
 C) applies in the short and long run.
 D) applies only in the short run.

39) A firm is operating such that the marginal product of labor is 10 and the marginal product of capital is 20. The firm is minimizing its costs only if

- A) the wage is half the rental rate.
 B) since capital is more productive than labor, the firm must be minimizing cost.
 C) the rental rate is half the wage.
 D) Given this information the firm can't be minimizing cost under any circumstances.

40) Which of the following is most likely to be a variable cost for a firm?

- A) the monthly rent on office space that it leased for a year
 B) the interest payments made on loans
 C) the payroll taxes that are paid on employee wages
 D) the franchiser's fee that a restaurant must pay to the national restaurant chain

41) Corn is produced in a perfectly competitive market. The demand for ethanol increases. This will cause the individual corn farmer's marginal revenue to _____ and their profit maximizing level of output to _____.

- A) increase; increase B) increase; decrease
 C) decrease; increase D) decrease; decrease

42) If labor and capital are complementary in production and a technological problem decreases the productivity of capital, then, ceteris paribus,

- A) wages are likely to rise.
 B) labor productivity is likely to rise.
 C) labor productivity is likely to fall.
 D) Both A and C are correct.

43) The number of seats available in an arena is fixed at 20,000. The equilibrium price for a ticket to a basketball game at the arena is \$75. The equilibrium price for a ticket to a hockey game at the arena is \$60. Which of the following is true?

- A) The demand for each hockey game must be lower than the demand for each basketball game.
- B) Basketball games must be more expensive to produce than hockey games.
- C) The demand for hockey games must be more elastic than the demand for basketball games.
- D) The supply of hockey games must be less elastic than the supply of basketball games.

44) A profit-maximizing firm will continue to employ land until

- A) $MRP_{LAND} = MP_{LAND}$.
- B) $MRP_{LAND} = 0$.
- C) $MRP_{LAND} = P_{LAND}$.
- D) $MP_{LAND} = P_{LAND}$.

45) Less investment takes place at ____ .

- A) higher expected rates of return.
- B) higher market interest rates.
- C) lower real interest rates.
- D) lower expected cost.

46) Tom's Donuts can invest in a new espresso machine that costs \$500 and will yield expected profits of \$350 each year for two years. What is the present discounted value of the expected profits from this investment if the interest rate is 4%?

- A) 323.59
- B) 480.77
- C) 660.13
- D) 673.08

47) Suppose a new government policy generates \$6,000 of benefits for local businesses and \$4,000 of costs for local households. We can best describe the policy as

- A) equitable.
- B) Pareto efficient.
- C) inefficient.
- D) potentially efficient.

48) Refer to Figure 8. Assume the No-Sweat Sweatshirt Manufacturing Company has fixed costs of \$90 and is a monopolistically competitive firm. To maximize profits in the short run, the firm should produce _____ personalized sweatshirts.

- A) 0
- B) 50
- C) 70
- D) 75

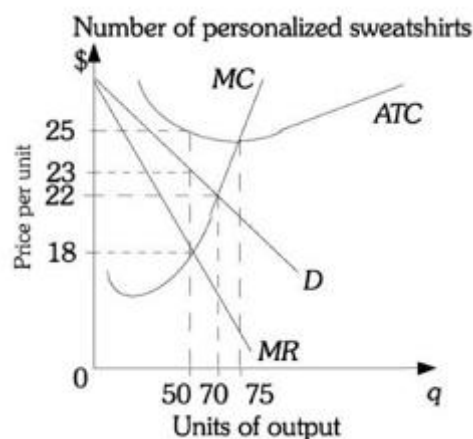


Figure 8

49) We refer to the whole class of goods that firms will _____ in a completely unregulated market economy as public goods.

- A) Under produce
- B) overproduce
- C) not produce at all
- D) Both A and C are correct.

50) When a monopolist sells two units of output, its total revenue is \$600. When a monopolist sells three units of output, its total revenue is \$690. In order to sell three units of output instead of only two, the monopolist must ____.

- A) decrease its price by \$30 per unit.
- B) decrease its price by \$90 per unit.
- C) decrease its price by \$70 per unit.
- D) make no change in price and increase output by one unit.

Obtained score

Question 3: Application questions (10 points per item, total 30 points)

1. Suppose that Bob spends 1200 dollars on product A and B every year, the price of product A is 24 dollar and product B is 32 dollars. The utility function of Bob is $U=8X_A^3X_B^2$, where X is the units of A and B that he consumed. please answer that:
 - (1) To maximize his utility, how Bob select the consumption combination of A and B?
 - (2) How much is the utility Bob gets from the consumption of products A and B.

2. Suppose there are two firms beside a river which named Clever River, one is a paper mill and the other is a fish farm. For the paper mill, the market quantity demand for the product X-Hard UTEC is $Q_X=25-0.5P_X$, and the total cost, $TC_X=x^2+2x+20$, where x is the output level of Hard UTEC paper. For the fish farm, the price of fish in the market is $P_Y=30$, and the total cost $TC_Y=y^2+xy$, where y is the output level of fish.
 - (1) If the two factories make their own independent decisions, how much of their profits?
 - (2) If the two factories merged and make their joint decisions, how much of their profits?

3. Suppose the SMC of firm A is: $SMC = 3Q^2 - 8Q + 100$, when the output $Q = 10$, the $STC=2400$.
 - (1) Please find the STC, SAC function.
 - (2) Please find the shutdown point and give the Q and cost (or price) combination of shutdown point.