

**選擇題：請作答於「答案卡」。每題均至少有一個正確答案。共 20 題，每題 5 分。**

**計分方式：**各題所有選項均答對者，得5分。每答錯一個選項扣2分，扣完為止。未作答者或答錯多於二個選項者，該題以零分計算。例如某題正確答案為(A)(B)(C)，某考生所選之答案為(A)(B)(D)，答錯兩個選項，包括漏選的(C)與多選的(D)，則該考生該題得1分。各題分數均獨立計算，不影響其他題分數。

1. Home Wood Company produces three different kinds of furniture: table, bed and sofa. Each has a marginal cost of 15 dollars. Three consumers, a student, a worker and a gamer, have the following values of each good (in dollars):

	Table	Bed	Sofa
Student	50	10	30
Worker	10	60	20
Gamer	25	25	25

Home Wood Company may or may not sell furniture as bundles. A bundle would consist one table, one bed and one sofa. If Home Wood Company does NOT sell furniture as bundles, and if each consumer wants to buy at most one piece of each kind, which of the following statements is/are TRUE for Home Wood Company?

- (A) To earn the maximum profit, the price for a table can be set as 25 dollars.  
(B) To earn the maximum profit, the price for a bed can be set as 25 dollars.  
(C) To earn the maximum profit, the price for a sofa can be set as 25 dollars.  
(D) Home Wood Company's profit is at most 90 dollars.  
(E) None of the above.
2. [Continuation of Question 1.] If Home Wood Company sells furniture as bundles, which of the following statements is/are TRUE for Home Wood Company?
- (A) To earn the maximum profit, the bundling price can be set as 75 dollars.  
(B) To earn the maximum profit, the bundling price can be set as 90 dollars.  
(C) The maximum profit is larger than or equal to 100 dollars.  
(D) The maximum profit is smaller than or equal to 90 dollars.  
(E) None of the above.
3. Athletes might get injured with some probability. Designate  $W_I$  as the wealth when they get injured and  $W_H$  as the wealth if they stay healthy. Paul and Emily are two athletes. Paul's utility is  $W_I W_H^2$ , and Emily's utility is  $W_I W_H$ . Assume that Paul's initial wealth when he stays healthy is strictly larger than that when he gets injured, and so is Emily's. Sport Care Insurance company would like to sell injury insurances to them. The insurance will cover the loss if they buy the insurance at some proposed rate  $a$ . The insurance plan is that the company will pay the insured an amount of  $M$  dollars if the insured has bought  $aM$  dollars of insurance. Which of the following statements is/are TRUE?
- (A) Emily is risk neutral.  
(B) Paul is risk averse.  
(C) When  $a = 1/2$ , Emily will definitely buy insurance.  
(D) When  $a = 1/2$ , Paul will definitely buy insurance.  
(E) None of the above.

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4. There is an asset  $Z$ , which is a random variable, taking value of  $-2$  with probability  $1/2$  and of  $3$  with probability  $1/2$ . If Ernest invests  $t$  dollars on this asset, then his payoff will be  $t(1 + Z)$  dollars. Suppose that Ernest's initial wealth is  $5$  dollars, and that his Bernoulli utility function is increasing and differentiable. Which of the following statements is/are TRUE?
- (A) Ernest will invest on  $Z$  if he is risk averse.  
(B) Ernest will invest on  $Z$  if he is risk neutral.  
(C) Ernest will invest on  $Z$  if he is risk loving.  
(D) If Ernest is risk averse, he will invest on  $Z$  only if his initial wealth is larger than  $10$  dollars.  
(E) None of the above.
5. Te Tea House is a monopoly on selling fruit tea and knows that there are two types of consumers,  $H$  and  $L$ . The inverse demand curve for the  $H$  type is  $P_H = 100 - 4Q_H$ , while the inverse demand curve for the  $L$  type is  $P_L = 60 - 4Q_L$ . Here,  $P_H$  and  $P_L$  are measured in dollars, and  $Q_H$  and  $Q_L$  represent the quantity of fruit tea in cups. The marginal cost per cup is  $20$  dollars. Suppose that Te Tea House cannot distinguish these two types of consumers. Te Tea House decides to set the same price to these consumers and wants to maximize its profit under this price scheme. Which of the following statements is/are TRUE?
- (A) Both types will consume the fruit tea.  
(B) Only  $H$  type will consume the fruit tea.  
(C) Only  $L$  type will consume the fruit tea.  
(D) The price will be set as  $50$ .  
(E) The price will be set as  $60$ .
6. [Continuation of Question 5.] Now suppose that Te Tea House can distinguish these two types of consumers and can charge different prices to them. Which of the following statements is/are true when Te Tea House wants to maximize its profit under this price scheme?
- (A) The price will be set as  $50$  dollars for  $H$  type.  
(B) The price will be set as  $40$  dollars for  $L$  type.  
(C)  $H$  type will consume  $20$  cups.  
(D)  $L$  type will consume  $10$  cups.  
(E) None of the above.
7. A chemical firm will pollute the nearby river if it produces a profitable (to itself) toxic substance of PCBs. The anglers who fish in this river will then be affected. This firm is willing to stop polluting the river by taking at least  $800$  dollars and is willing to give at most  $600$  dollars to the anglers for keeping producing PCBs. On the other hand, the anglers are willing to give at most  $500$  dollars to stop the pollution and are willing to take at least  $700$  dollars for letting PCBs be produced. Note that the strong Coase theorem reads: in the absence of transaction costs, the assignment of property rights has no effect on the allocation of resources. Which of the following statements is/are TRUE?
- (A) The strong Coase theorem holds in the above scenario.  
(B) If the property right of the river belongs to the chemical firm, PCBs will be produced.  
(C) If the property right of the river belongs to the anglers, PCBs will be produced.  
(D) If the property right of the river belongs to the chemical firm, there is a transaction of  $600$  dollars.  
(E) None of the above.

8. Firm Alpha produces  $x$  with profit function  $100x - 0.5x^2$ . Firm Beta produces  $y$  with profit function  $100y - 0.5(x + y)^2$ . Both Firm Alpha and Firm Beta are profit maximizers. Suppose that the social welfare is the summation of Firm Alpha's and Firm Beta's profits, and let  $x^*$  and  $y^*$  be the amounts of  $x$  and  $y$  respectively that maximize the social welfare. Which of the following statements is/are TRUE?
- (A) There should be a Pigouvian tax imposed on Firm Alpha to maximize the social welfare.  
 (B) There should be a Pigouvian tax imposed on Firm Beta to maximize the social welfare.  
 (C) When the social welfare is maximized,  $x^* = 100$ .  
 (D) When the social welfare is maximized,  $y^* = 50$ .  
 (E) None of the above.
9. There is a public good  $s$ , which can be consumed and produced by player 1 and player 2. Designate  $s_1$  and  $s_2$  to be the amounts of  $s$  produced by player 1 and player 2, respectively. Designate  $c$  to be the marginal cost in producing  $s$ . Let player 1's profit function be  $\ln(1 + s_1 + s_2) - cs_1$  and player 2's profit function be  $\ln(1 + s_1 + s_2) - cs_2$ . Suppose that both players are profit maximizers, and that the social welfare is the summation of player 1's and player 2's profits. Assume that  $0 < c < 1$ . Which of the following statements is/are TRUE?
- (A) In any Nash equilibrium, player 1 and player 2 produce the same amounts of  $s$ .  
 (B) In any Nash equilibrium, there is a player who produces nothing.  
 (C) In any Nash equilibrium, the social welfare is zero.  
 (D) In some Nash equilibrium, the social welfare is maximized.  
 (E) None of the above.
10. There are only two chocolate stores in town, Godiva and See's. Each chocolate costs 2 to the stores. Suppose that they engage in the Cournot competition. The market demand for the consumers is  $P = 20 - Q$ , where  $P$  is the price and  $Q$  is the quantity. Which of the following statements is/are TRUE in equilibrium?
- (A) Godiva and See's make the same amounts of chocolates.  
 (B) The chocolate price is 2.  
 (C) The chocolate price is 8.  
 (D) There is a deadweight loss.  
 (E) None of the above.
11. Susan has 20 dollars to spend on clothes ( $x_1$ ) and food ( $x_2$ ). Her preference can be represented by the following utility function:
- $$u(x_1, x_2) = \begin{cases} 2x_2 & \text{if } x_2 < 10, \\ \sqrt{x_1} + 2x_2 & \text{if } x_2 \geq 10. \end{cases}$$
- That is, Susan will not buy clothes unless she has enough food. The prices of  $x_1$  and  $x_2$  are  $p_1 = p$  and  $p_2 = 1$ , respectively. In the optimum, which of the following statements is/are TRUE?
- (A) The marginal rate of substitution of clothes for food (in absolute value) is diminishing as Susan buys more clothes.  
 (B) Susan will always buy 10 units of food if  $p < 1/4$ .  
 (C) Susan will always use up all her money.  
 (D) Susan will buy fewer clothes and more food if clothes become more expensive.  
 (E) Susan will buy both clothes and food if  $p > 1$ .

12. A company uses the following production function:

$$f(L, K) = \min[L, K],$$

where  $L$  represents labor and  $K$  represents machines. Suppose that in the short run, this company has only one machine while it can adjust the amount of labor. In the long run, it can choose the optimal amounts of both labor and machines. Let  $w$  be the wage and  $r$  be the interest rate. Which of the following statements is/are TRUE?

- (A) In the short run, this company can always increase the output by hiring more labor.
  - (B) The short-run average cost is always higher than the long-run average cost.
  - (C) In the long run, the company will use only labor if  $w < r$ .
  - (D) In the long run, the average cost is always equal to the marginal cost.
  - (E) The short-run marginal cost is lower than the long-run marginal cost as long as the output has not reached one unit.
13. Suppose that the market for sports drinks is perfectly competitive in a local city. Currently, there are 50 domestic firms in this market, each of which has the following total cost function:

$$TC_i(q) = 20 + 6q_i + 5q_i^2.$$

The market demand for sports drinks is:

$$Q_D = 180 - 2p.$$

However, a foreign company is about to enter this market, which produces the same products. It has the following total cost function:

$$TC_f(q) = 6q_f + 0.5q_f^2.$$

Which of the following statements is/are TRUE?

- (A) Before the foreign firm enters, the market equilibrium price is between 35 and 50.
  - (B) The market equilibrium price will increase after the foreign firm enters.
  - (C) The profit for every domestic firm will be reduced if the foreign firm enters.
  - (D) Every domestic firm will produce more if the foreign firm enters.
  - (E) Once the foreign firm enters, it will occupy more than 15% of the market share.
14. In the following statements regarding different market structures, which is/are TRUE?
- (A) Every firm earns zero profit in a perfectly competitive market, while a monopolist can generally earn a positive profit.
  - (B) The deadweight loss caused by a monopoly is always positive, while it is zero under perfect competition.
  - (C) The equilibrium price in an oligopolistic market will always be higher than that determined in a perfectly competitive market.
  - (D) In an oligopolistic market with a given demand, where firms produce homogeneous products and share the same cost function which has a constant marginal cost, the total quantity produced under Cournot competition is lower than that under Bertrand competition.
  - (E) In both perfectly competitive and monopolistically competitive markets, firms generally choose an output where the long-run average cost is at the minimum level because of free entry.

15. Andy is a student who needs to support himself financially to complete his degree. He considers taking two part-time jobs. Job 1 pays an hourly wage  $w_1$  and Job 2 pays  $w_2$ . Subtracting the hours of sleep, he has totally  $T$  hours available to engage in different activities per week. Specifically,  $T = L_1 + L_2 + \ell$ , which means that he spends  $L_1$  hours in working for Job 1,  $L_2$  hours in Job 2, and  $\ell$  hours in leisure. Assume that labor income is his only source of income, which will be used in purchasing a consumption good  $c$  with a price  $p$ . That is,  $pc = w_1L_1 + w_2L_2$ . His utility function is:

$$u(c, \ell) = \alpha\sqrt{c} + \sqrt{\ell},$$

where  $\alpha > 0$  is some constant, which measures the importance of the consumption good. Which of the following statements is/are TRUE?

- (A) If  $w_1 > w_2$ , Andy will only work for Job 1 and give up Job 2.
  - (B) Other things being equal, when  $w_1$  becomes higher, Andy will work more hours.
  - (C) The choice of the consumption good has nothing to do with  $T$ .
  - (D) Other things being equal, when the consumption good is more expensive, Andy will work harder to earn more money.
  - (E) Other things being equal, when  $\alpha$  is lower, Andy will be lazier in that he will work fewer hours.
16. There are many homogeneous firms in a perfectly competitive market. Every firm uses three inputs:  $x_1, x_2$  and  $x_3$ , and has the same production function as follows:

$$f(x_1, x_2, x_3) = x_1 + (x_2)^{0.5}(x_3)^{0.5}.$$

In the short run, both  $x_2$  and  $x_3$  are adjustable, while  $x_1$  is fixed at  $x_1 = 1$ . Currently, there are 20 firms in the market. On the other hand, in the long run, all factors can be adjustable, and the equilibrium number of firms is yet to be determined. Suppose that  $w_i$  is the price of input  $i$ . We assume that  $w_1 < w_2 < w_3$  both in the short run and long run. The market demand function is:

$$Q_D = 200 - p.$$

Which of the following statements is/are TRUE?

- (A) In the long-run equilibrium, there are more firms staying in the market than in the short run.
  - (B) Every firm has a technology of constant returns to scale.
  - (C) Every firm staying in the market produces more output in the long run than it does in the short run.
  - (D) Both the short-run and the long-run marginal cost curves are horizontal lines.
  - (E) The market equilibrium price in the long run is lower than that in the short run.
17. Recently, our government has passed a regulation in order to reduce the usage of plastic bags and straws. Firms used to bear the cost of plastic bags and straws; however, after the regulation is enforced, this cost is shifted to consumers, in that they either need to pay for the plastic products, or bring their own bags or straws. The grocery stores and supermarkets industry is one of the industries that this policy applies to. Suppose that the grocery market in some local area is perfectly competitive where there are many homogeneous firms which produce the same products. Which of the following situations will happen to this market after the implementation of this regulation?
- (A) The equilibrium total output after the regulation is enforced must be higher than before.
  - (B) The equilibrium price after the regulation is enforced must be lower than before.
  - (C) Every firm must earn more profit than before.
  - (D) There must be some firms that enter the market because of the policy.
  - (E) The consumer must be better off because of this policy.

18. A particular suit brand has become very popular recently and its suits are available both in a “bricks and mortar” (B&M) retailer and in an online store. Suppose that the prices of a suit set by the B&M retailer and by the online store are  $p_b$  and  $p_i$ , respectively. Given these prices, every consumer chooses one place to shop. If a consumer shops at the B&M retailer, he can try on the suits and wear them immediately; however, he has to go to the physical store with a travelling cost  $t$ . Suppose that there is a continuum of consumers with different travelling costs,  $t \in [0,1]$ , which are uniformly distributed between 0 and 1. This  $t$  is considered the consumer’s “type”. A consumer with type  $t$  obtains a utility  $\sqrt{x} - p_b x - t$  if he shops at the B&M retailer. On the other hand, if a consumer shops at the online store, there is no travelling cost; however, he needs to wait for the delivery of the good, and he may not be completely satisfied because he cannot try on the suit. Therefore, the value of a suit brought in the online store is discounted, and he obtains a utility  $\delta\sqrt{x} - p_i x$  if he shops at the online store, where  $0 < \delta < 1$  is a constant discount factor that captures the cost of the waiting and the dissatisfaction. If he decides not to buy any suit, he obtains zero utility. Given the prices  $p_b$  and  $p_i$  and the discount factor  $\delta$ , a consumer’s optimal amount of suits is  $x_b^*$  if he shops at the B&M retailer, and  $x_i^*$  if he shops at the online store. Then which of the following statements is/are TRUE?

- (A)  $x_i^* = \frac{\delta^2}{4p_i^2}$ .
- (B)  $x_b^*$  does not depend on the travelling cost  $t$ .
- (C) A consumer will always buy suits from the B&M retailer if its suits are cheaper, i.e.,  $p_i > p_b$ .
- (D) There are some consumers who will not buy any suit.
- (E) If a consumer with type  $t$  decides to shop at the online store, then a consumer with a type  $t' < t$  will also shop at the online store.

19. Tom has a utility function  $u(w) = \ln w$ , where  $w$  stands for wealth. He just bought a car, and is buying a car insurance. Suppose that his current wealth is  $w_0$ . According to the data, there is a probability  $q$  that an accident will happen to a driver, which causes a damage  $d < w_0$ , and with probability  $1 - q$ , nothing happens. The insurance policy provides a coverage with an amount of  $x$  and a premium  $p$ , which requires that Tom pay  $px$  in advance, while he will be compensated by  $x$  once an accident happens. Suppose that the insurance company’s profit is always non-negative, which means that the expected premium is no less than the expected cost of compensation, i.e.,  $px - qx \geq 0$  or  $p \geq q$ . Then given the parameters  $(w_0, d, p, q)$ , his optimal choice of coverage is  $x^*$ . Which of the following statements is/are TRUE?

- (A) Tom will always buy full coverage, i.e.,  $x^* = d$ .
- (B) If  $x^* < d$ , that is, Tom does not choose full coverage but pays for some of the damage by himself, then when Tom is more wealthy (i.e.,  $w_0$  is higher), other things being equal, he will choose more coverage (i.e., a higher  $x^*$ ).
- (C) If the insurance company charges  $p > q$ , then  $x^* < d$ , because the premium is too high.
- (D) The larger the damage (i.e., the higher  $d$ ), the more coverage Tom will choose.
- (E) The more likely that an accident happens (i.e., the higher  $q$ ), the more coverage Tom will choose.

20. Two basketball teams consider trading some of their players with each other. Currently, Team A puts two point guards ( $x$ ) and one center ( $y$ ) on the trade table, and Team B puts one point guard and two centers on the trade table. Teams' utility functions are:

$$u_A(x, y) = 3x + 2y \text{ and } u_B(x, y) = x + 4y.$$

For simplicity, let's assume that all players have the same talents, but teams have different needs for players of different positions. For example, Team A wants point guards more than centers, while Team B prefers to have more centers. Let the prices of  $x$  and  $y$  be  $p_x = p$  and  $p_y = 1$ , respectively. Which of the following statements is/are TRUE?

- (A) The competitive equilibrium price is  $p^* = 2$ .
- (B) After the trade, Team A gets all the centers that are put on the table.
- (C) After the trade, Team B gets some point guards and some centers from the trade table.
- (D) There is more than one Pareto optimal allocation.
- (E) Every Pareto optimal allocation is a competitive equilibrium allocation, and vice versa.

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