

考試科目	經濟學	系所別	商學院共同科	考試時間	2月10日(四) 第二節
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### I. Multiple Choice (1 point each)

Identify the letter of the choice that best completes the statement or answers the question.

- Suppose the demand function for a good is expressed as  $Q = 200 - 4p$ . If the good currently sells for \$30, then the price elasticity of demand equals
  - 1.
  - 1.5.
  - 4.
  - 6.67.
- If Andy likes broccoli (B) but hates cabbage (C), which of the following might best represent his utility function for broccoli and cabbage?
  - $U = B + C$
  - $U = \min\{B, C\}$
  - $U = U/C$
  - $U = B^{0.5}C^{0.5}$
- As the price of a Giffen good falls, the consumer will
  - purchase more units.
  - purchase fewer units.
  - not change the amount purchased.
  - There is not enough information to answer this question.
- What will happen to the equilibrium price of new textbooks if more students attend college, paper becomes more expensive, textbook authors accept lower royalties, and more used textbooks are sold?
  - Price will rise.
  - Price will fall.
  - Price will stay exactly the same.
  - The price change will be ambiguous.
- With capital on the vertical axis and labor on the horizontal axis, vertical isoquants imply that
  - capital and labor are perfect substitutes.
  - capital and labor must be used together in certain proportion.
  - capital is not productive.
  - labor is not productive.

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6. In a monopolistically competitive market, the entry of new firms will lead to the demand curve of an incumbent firm become
- steeper.
  - flatter.
  - remain the same.
  - none of the above.
7. Which of the following statement is wrong for an oligopolistic market?
- A firm in the market has a supply curve.
  - The market outcomes could be like a monopoly.
  - When the number of firms in the market getting large, this market will approach to a perfectly competitive market.
  - The owners of firm consider the output effect and the price effect when making production decisions.
8. Which of the following statement is wrong for a perfectly competitive market?
- Some firms might earn profit in the long run.
  - For a firm, average revenue equals marginal revenue.
  - When the fixed cost is zero, a firm will leave the market when it earns negative profit.
  - The market long-run supply curve is always horizontal at the price.
9. Which of the following statement is wrong?
- In a perfectly competitive market which all firms have the same cost structure, the firms will produce at the efficient scale in the long run.
  - Under the average cost pricing, a monopoly will not create deadweight losses.
  - A competitive market might not as efficient as a monopoly.
  - Price discrimination might create deadweight losses.
10. Consider the production possibilities frontier of two goods. Which of the following statement is wrong?
- A slope of the PPF measures the opportunity cost between the two goods that producers face.
  - The production point will not lie to the right of the PPF.
  - The consumption point will not lie to the right of the PPF.
  - The production point and the consumption point could be different points.

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11. After a certain nation changed its policy from one that banned international trade in wheat to one that allowed international trade in wheat, the nation began importing wheat. As a result, total surplus in the wheat market increased by \$10 million. Which of the following changes could have occurred as well?

- A. The price of wheat in that nation increased with the adoption of the new policy.
- B. The domestic quantity of wheat supplied increased with the adoption of the new policy.
- C. Consumer surplus in the wheat market increased by \$7 million and producer surplus in the wheat market increased by \$3 million.
- D. Consumer surplus in the wheat market increased by \$15 million and producer surplus in the wheat market decreased by \$5 million.

12. Which of the following events would be consistent with purchasing-power parity?

- A. The price level in the United States rises more rapidly than that in Ireland and the real exchange rate defined as Irish goods per unit of U.S. goods stays the same.
- B. The money supply in the United States rises more rapidly than in Egypt and the nominal exchange rate defined as Egyptian pounds per dollar falls.
- C. Earl, a worldwide traveler, looks at exchange rates and worldwide breakfast prices one morning and finds that whatever country he decides to go to he can convert \$15 into enough local currency to buy the same breakfast.
- D. All of the above are correct.

13. According to classical macroeconomic theory, in the long run

- A. monetary growth affects both real and nominal variables.
- B. the only real variable affected by monetary growth is the unemployment rate.
- C. a number of factors that affect unemployment are influenced by monetary growth.
- D. monetary growth affects nominal but not real variables.

14. Jennifer took out a fixed-interest-rate loan when the CPI was 100. She expected the CPI to increase to 103 but it actually increased to 105. The real interest rate she paid is

- A. higher than she had expected, and the real value of the loan is higher than she had expected.
- B. higher than she had expected, and the real value of the loan is lower than she had expected.
- C. lower than she had expected, and the real value of the loan is higher than she had expected.
- D. lower than she had expected, and the real value of the loan is lower than she had expected.

考試科目	經濟學	系所別	商學院共同科	考試時間	1 月 10 日 (四) 第二節
<p>15. There is a temporary adverse supply shock. Given the effects of this shock, if the central bank chooses to return unemployment closer to its previous rate it would</p> <p>A. raise the rate at which it increases the money supply. In the long run this will shift the short-run Phillips curve right.</p> <p>B. raise the rate at which it increases the money supply. In the long run this will shift the short-run Phillips curve left.</p> <p>C. reduce the rate at which it increases the money supply. In the long run this will shift the short-run Phillips curve right.</p> <p>D. reduce the rate at which it increases the money supply. In the long run this will shift the short-run Phillips curve left.</p> <p>16. Which one of the following will increase the supply of money in the economy, everything else held constant?</p> <p>A. If the general public in the economy decides to hold more currency in the pockets.</p> <p>B. If the banking system decides to reduce the holding of excess reserves.</p> <p>C. The central bank sells bonds to the general public.</p> <p>D. The central bank sells its foreign currency reserves.</p> <p>17. Which one of the following is not considered to be “conventional monetary policy tool”?</p> <p>A. Open market operation.</p> <p>B. Reserve requirement ratio.</p> <p>C. Discount rate and lending.</p> <p>D. Large scale asset purchases.</p> <p>18. In the December 2021 statement, the FOMC “decided to keep the target range for the federal funds rate at 0 to 1/4 percent.” What is the federal funds rate?</p> <p>A. The interest rate anyone needs to pay to borrow money from the government.</p> <p>B. The interest rate banks receive by depositing money with the central bank.</p> <p>C. The interest rate banks pay to borrow money from the central bank.</p> <p>D. The interest rate banks pay to borrow money from other banks.</p> <p>19. Since 2014, the ECB has adopted a negative interest rate policy. What is the rate that is negative?</p> <p>A. The interest rate the ECB pays to banks for depositing money with the ECB.</p> <p>B. The interest rate that the ECB lends to banks.</p>					

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- C. The interest rate that the banks lend and borrow from other banks.  
D. The rate of Eurodollar.

20. Everything else held constant, which of the following does not cause aggregate demand to increase?

- A. An increase in consumer spending.  
B. An increase in investment spending.  
C. An increase in taxes.  
D. An increase in exports.

## II. Problems and Short-essay Questions

Please answer the following questions IN SEQUENCE. All questions may be answered in either Chinese or English.

1. Suppose that the inverse demand curve for paper is  $p = 150 - Q$ . Paper is produced with a constant marginal cost of 10. For simplicity, assume that there are no fixed costs. Producing paper creates pollution. Each unit of production generates an external cost of 80 to the residents who live near the paper mill(s).

A. (7 points) What are the equilibrium price, quantity and the associated deadweight loss if paper is produced by perfectly competitive firms?

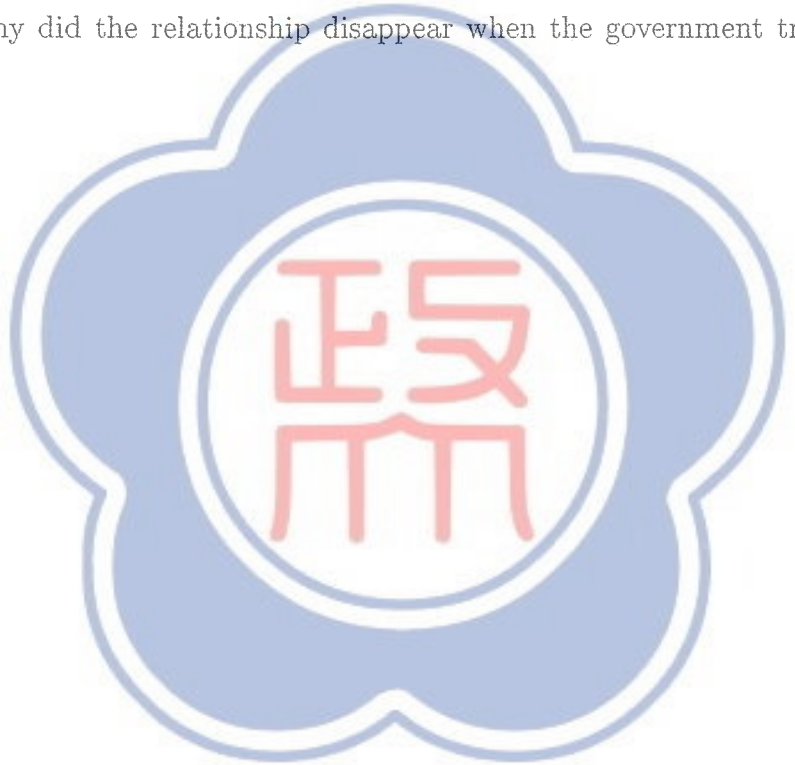
B. (7 points) What are the equilibrium price, quantity and the associated deadweight loss if paper is produced by a monopoly?

C. (6 points) Suppose the residents can costlessly negotiate with the monopoly. What is the equilibrium quantity of paper produced? What is the minimum monetary transfer from the residents to the monopoly that can achieve the social optimum?

2. Assume Taiwan is a small country and imports pork under free trade. The demand and supply are all linear. The consumers of Taiwan consume 1 million kilograms of pork per year. 400,000 of those are produced domestically and 600,000 are imported.

A. (10 points) Assume due to some reasons, the international price of pork falls by 100 dollars per kilogram. The consumers now consume 1.2 million kilograms of pork per year. 1 million of them are imported. Please calculate the welfare gain and the change of the producer surplus of the economy of Taiwan.

B. (10 points) If the government sets up a quota that only allows 400,000 kilograms of pork to be imported. After this policy, the price of pork in Taiwan rises by 150 dollars. Please calculate the deadweight loss for this policy.

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<p>3. Suppose Taiwan makes a decision to tax the import of agricultural products from abroad, but it does not decrease taxes or increase any other government spending to offset this tax revenues. Using diagrams and words, show and explain what happens to</p> <ul style="list-style-type: none"><li>A. (12 points) national saving, domestic investment, net capital outflow and the interest rate;</li><li>B. (4 points) the exchange rate; and</li><li>C. (4 points) the amount of exports, imports and trade balance.</li></ul> <p>4. (20 points) Please explain, in words, why did the relationship of the Phillips curve exist in the past, and then why did the relationship disappear when the government tried to use it to boost the economy?</p> <div data-bbox="399 739 1197 1500" style="text-align: center;"></div>					
備註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。				

考試科目	國際經濟法	系所別	國際經濟學貿易學 國際經濟法組	考試時間	2月10日(四)第二節
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- 一、歐盟於今年七月公布「碳邊境調整措施」之規則草案，國內許多媒體將此稱之為「碳關稅」，此一說法誤解了「邊境調整措施」實際上為要求進口產品符合與本國同類產品相同的內國措施之本質。請問在 GATT1994 的規範下，針對關稅措施、內國措施、以及邊境調整措施的基本法律原則為何？（15%）此外，歐盟一再強調其「碳邊境調整措施」將以符合 WTO 規範的方式實施，假設歐盟此一措施無法通過 GATT1994 之下有關邊境調整措施的相關規定，歐盟可以援引哪一些例外規定來正當化其措施？（10%）
- 二、中國於去（2021 年）月 2 月與 9 月分別宣布暫停我國鳳梨、釋迦與蓮霧的進口，理由為於該些產品進行抽驗發現介殼蟲，我國則於 11 月在 SPS 委員會對中國此舉提起特定貿易關切。請問中國此一措施可能涉及哪些 WTO 之法律規定？（15%）假設透過特定貿易關切無法解決此一爭議，我國欲透過 WTO 的爭端解決機制來處理，請問爭端解決機制之主要程序與步驟為何？（15%）
- 三、WTO 第 12 屆部長會議於今年再度確定延期，但 67 個 WTO 會員成功的完成「服務之國內規章聯合倡議」之談判、並於 12 月 2 日通過一宣言納入此一談判成果，此一談判成果將透過參與聯合倡議之 WTO 會員，以修改其服務業特定承諾表方式納入。請問於服務貿易協定中，與特定承諾表以及國內規章相關的法律規定有哪些？（20%）
- 四、於去（2021）年 10 月的防衛協定委員會中，許多 WTO 會員就半年間已有超過 30 件啟動防衛措施調查通知的狀況表示憂心。請問相較於反傾銷稅以及平衡稅，實施防衛措施的法律要件有何特性？（15%）

考試科目	國際貿易法	系所別	國際經濟與貿易學 國際經濟法學	考試時間	2 月 10 日(四) 第二節
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五、請試譯以下條文 (10%)

1. A Member may apply a safeguard measure only following an investigation by the competent authorities of that Member pursuant to procedures previously established and made public in consonance with Article X of GATT 1994. This investigation shall include reasonable public notice to all interested parties and public hearings or other appropriate means in which importers, exporters and other interested parties could present evidence and their views, including the opportunity to respond to the presentations of other parties and to submit their views, inter alia, as to whether or not the application of a safeguard measure would be in the public interest. The competent authorities shall publish a report setting forth their findings and reasoned conclusions reached on all pertinent issues of fact and law.
2. Members shall provide for criminal procedures and penalties to be applied at least in cases of wilful trademark counterfeiting or copyright piracy on a commercial scale. Remedies available shall include imprisonment and/or monetary fines sufficient to provide a deterrent, consistently with the level of penalties applied for crimes of a corresponding gravity. In appropriate cases, remedies available shall also include the seizure, forfeiture and destruction of the infringing goods and of any materials and implements the predominant use of which has been in the commission of the offence. Members may provide for criminal procedures and penalties to be applied in other cases of infringement of intellectual property rights, in particular where they are committed wilfully and on a commercial scale.

備註

- 一、作答於試題上者，不予計分。
- 二、試題請隨卷繳交。

考試科目	統計學	系所別	國際經營與貿易學系	考試時間	2月10日(星期四)第四節
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**I. Multiple Choice (4 points each)**

Identify the letter of the choice that best answers the question.

Upper-tail critical values of chi-square distribution with different degrees of freedom:

$$\chi_{1,5\%}^2 = 3.841; \chi_{2,5\%}^2 = 5.991; \chi_{3,5\%}^2 = 7.815; \chi_{4,5\%}^2 = 9.488; \chi_{5,5\%}^2 = 11.070; \chi_{6,5\%}^2 = 12.592.$$

Critical points of a stand normal distribution:  $Z_{0,95} = 1.645; Z_{0,975} = 1.96.$

- The variables  $x$  (temperature in  $^{\circ}\text{C}$ ) and  $y$  (temperature in  $^{\circ}\text{F}$ ) are related by the formula  $y = 32 + 1.8x$ . Therefore, the correlation between  $x$  and  $y$  will be:
  - 1.8, because if  $x$  increases by  $1^{\circ}\text{C}$  then  $y$  increases by  $1.8^{\circ}\text{F}$ .
  - 0, because if  $x = 0$  then  $y = 32$ .
  - 1, because if  $x$  decreases then  $y$  decreases.
  - 1, because the variables have a deterministic, linear, increasing relationship.
- Suppose you are playing a game and you have 0.2 chance of winning. Suppose you decide to play repeatedly until you win. The games are independent. What is the probability that you win on the first or second try?
  - $0.2 \times 0.8 = 0.16$ .
  - $0.2 \times 0.2 = 0.04$ .
  - $0.2 + (0.2 \times 0.8) = 0.36$ .
  - 0.2.
- Suppose the probability that a child lives with his or her mother as the sole parent is 0.258, and the probability that a child lives with his or her father as sole parent is 0.037. Then the probability that a child either lives with both or with neither parent is:
  - $0.258 + 0.037 = 0.295$ .
  - $1 - 0.037 = 0.963$ .
  - $1 - 0.258 = 0.742$ .
  - $1 - (0.258 + 0.037) = 0.705$ .
- If you have a data set that consists of the following three values 1, 2, and 3, which of the following statements are true:
  - The range of the data is 3.
  - The sample standard deviation equals the sample average.
  - The sample standard deviation equals the sample variance.
  - None of the above are true.

考 試 科 目	統計學	系 所 別	國際經營與貿易學系	考 試 時 間	2 月 10 日 (星期四) 第四節
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5. Assume the model:  $Y = 5 + 2X_1 + 3X_2 + \varepsilon$ ,  $\varepsilon \sim N(0, 81)$ . What is the  $\text{Var}[Y | X_1 = 0, X_2 = 4]$ ?

- A. 9.
- B. 81.
- C. 17.
- D. 6.

Question 6 and 7.

6. Suppose that 1% of the population are infected with the COVID-19 coronavirus. Suppose we have a test for the infection that has 80% sensitivity (the ability of a test to correctly identify patients with an infection) and 90% specificity (the ability of a test to correctly identify people without the infection). What is the probability of a false positive?

- A. 0.99.
- B. 0.10.
- C. 0.01.
- D. 0.20.

7. Following the above question, what is  $\text{Pr}(\text{COVID-19-infected given that the test is positive})$ ?

- A. 0.80.
- B. 0.14.
- C. 0.01.
- D. 0.075.

8. In a random sample of 1000 college graduates, 75% stated that they prefer bubble tea (over coffee). Therefore, a 90% confidence interval for the proportion of all college graduates who prefer bubble tea is:

- A.  $0.75 \pm 1.645 \times \sqrt{0.75/1000}$ .
- B.  $0.75 \pm 1.96 \times \sqrt{0.75 \times 0.25/1000}$ .
- C.  $0.75 \pm 1.645 \times \sqrt{0.75 \times 0.25/1000}$ .
- D.  $0.75 \pm 1.96 \times \sqrt{0.75/1000}$ .

考 試 科 目	統計學	系 所 別	國際經營與貿易學系	考 試 時 間	2 月 10 日 (星期四) 第四節
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9. A statistical study considers the question of whether highly educated people are less likely to develop dementia than others. In this study, the alternative hypothesis is:
- Insufficient information is given to allow us to determine the null hypothesis.
  - There is a relationship between level of education and the development of dementia.
  - There is no relationship between level of education and the development of dementia.
  - Highly educated people are less likely than others to develop dementia.
10. A study of undergraduate students failed ( $p$ -value = 0.22) to find a difference in pulse rates between men and women. Which of the following is true?
- The null hypothesis is rejected.
  - It is possible that they committed a Type 1 error.
  - The research hypothesis is supported.
  - It is possible that they committed a Type 2 error.

**II. Problem-Solving Questions:**

Please answer the following questions IN SEQUENCE.

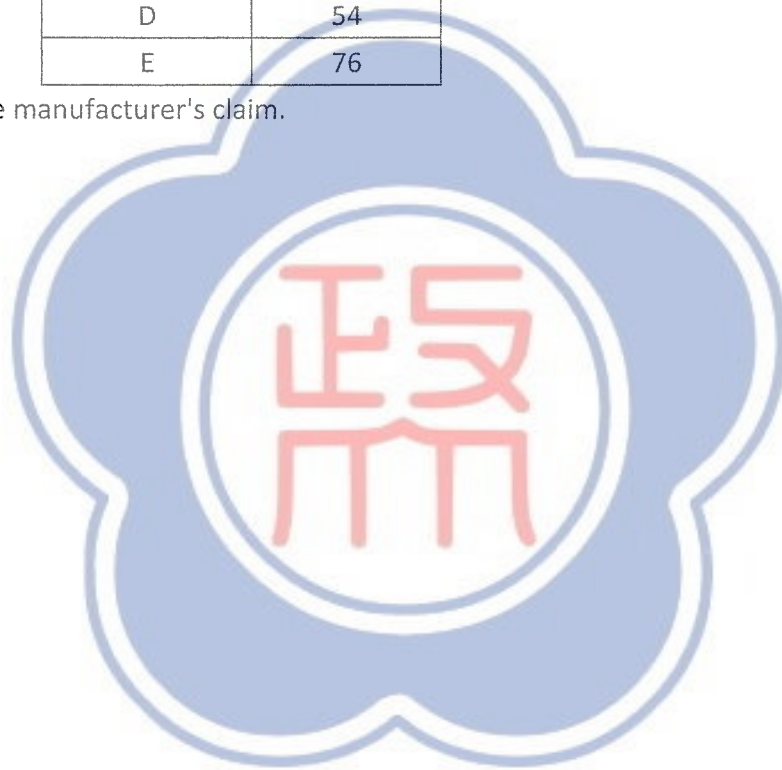
- 30 people took a COVID-19 PCR test. However, the doctor was so careless that she/he forgot to label the test. She/he had to give back all the test results randomly, with one unique sample to each person. In particular, each person gets her/his own test result with probability  $1/30$ . Let  $X$  be the number of people who get their own test results.
  - (10 points) What is the expected value of  $X$ ?
  - (10 points) What is the variance of  $X$ ?
- (20 points) In manufacturing its smartphone, SmartComm buys a particular kind of microchip from 3 suppliers: 30% from Samsung, 20% from MediaTek, and 50% from TSMC. SmartComm has extensive histories on the reliability of the chips and knows that 5% of the chips from Samsung are defective; 4% from MediaTek are defective and 2.5% from TSMC are defective. In testing a newly assembled smartphone, SmartComm found the microchip to be defective. Which provider is the likely culprit?

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3. (20 points) A major electric-vehicle (EV) manufacturer claimed that the frequencies of repairs on all five models of its EV are the same. A sample of 300 repair services showed the following frequencies on the various makes of EV.

Model	Frequency
A	42
B	65
C	63
D	54
E	76

At  $\alpha = 0.05$ , test the manufacturer's claim.



備

註

- 一、作答於試題上者，不予計分。
- 二、試題請隨卷繳交。

考試科目

微積分

系所別

國貿所

考試時間

2 月 10 日 (四) 第 4 節

※ Show all your work for full credit.

1. Evaluate the following integrals. (20%)
- (a)  $\int_1^8 \frac{1}{x+2\sqrt[3]{x}} dx.$
- (b)  $\int_0^9 |\sqrt{x} - 1| dx$
- (c)  $\int_0^1 x 3^x dx.$
- (d)  $\int_0^1 x^3 \sqrt{1-x^2} dx$
2. Let  $f$  be a differentiable function such that  $x^3 f(x) + f(x^2) = 4$  for all  $x > 0$ . Find  $f'(1)$ . (10%)
3. Let  $a$  and  $b$  be real numbers such that  $\lim_{x \rightarrow \infty} (x e^{1/x} - (ax + b)) = 0$ . Find the values of  $a$  and  $b$ . (10%)
4. Find  $\frac{dy}{dx}$  at  $x = 1$  if  $x^y + xy = 4$ . (10%)
5. Find the maximum and minimum values of the function  $f(x, y) = x + 2y - z$  subject to the constraint  $x^2 + y^2 + z^2 = 6$ . (10%)
6. Determine the interval of convergence for the series:  $\sum_{n=1}^{\infty} \frac{(-1)^n (2x-1)^n}{n 3^n}$ . (10%)
7. Evaluate the double integral  $\iint_R 8x^3 y dx dy$ , where  $R$  is the rectangle with vertices  $(-1,0)$ ,  $(2,0)$ ,  $(2,3)$ ,  $(-1,3)$ . (10%)
8. Find  $\lim_{n \rightarrow \infty} \left( \frac{1}{n+1} + \frac{1}{n+2} + \dots + \frac{1}{2n} \right)$ . (10%)
9. Let  $f(x) = (\ln x)^x$ . Find  $f'(x)$ . (10%)

備

註

- 一、作答於試題上者，不予計分。  
二、試題請隨卷繳交。