

考試科目	經濟學	系所別	商學院共同科	考試時間	2月2日(五)第一節
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一、Multiple Choice (1 point each)

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

1. Beef is a normal good. You observe that both the equilibrium price and quantity of beef have fallen over time. Which of the following explanations would be most consistent with this observation?

A. Consumers have experienced an increase in income, and beef-production technology has improved.

B. The price of chicken has risen, and the price of steak sauce has fallen.

C. New medical evidence has been released that indicates a negative correlation between a person's beef consumption and life expectancy.

D. Beef producers, concerned about the health of their customers, decided to produce relatively less beef.

2. Suppose a tax of \$4 per unit is imposed on a good, and the tax causes the equilibrium quantity of the good to decrease from 2,000 units to 1,700 units. The tax decreases consumer surplus by \$3,000 and decreases producer surplus by \$4,400. The deadweight loss of the tax is

A. \$ 200.

B. \$ 400.

C. \$ 600.

D. \$ 1,200.

3. When a tax is levied on sellers of tea, buyers of a good bear the larger share of the tax burden when the

(i) supply is more elastic than the demand for the product.

(ii) demand is more elastic than the supply for the product.

(iii) tax is placed on the sellers of the product.

(iv) tax is placed on the buyers of the product.

A. (i) only

B. (ii) only

C. (i) and (iii) only

D. (i) and (iv) only

備註

一、作答於試題上者，不予計分。
二、試題請隨卷繳交。

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<p>4. The substitution effect of an increase in the interest rate will result in an increase in</p> <p>A. consumption when young and increase in savings when young. B. consumption when old and an increase in savings when young. C. consumption when young and an increase in savings when old. D. savings when old and an increase in consumption when old.</p> <p>5. Assume that goods X and Y are not Giffen goods. If the price of good X falls, a consumer will definitely</p> <p>A. consume more of good X because her budget constraint has rotated outward. B. consume more of good X because her budget constraint has shifted outward. C. consume more of good Y because her budget constraint has rotated outward. D. consume more of good Y because her budget constraint has shifted outward.</p> <p>6. Thirsty Thelma owns and operates a small lemonade stand. When Thelma is producing a small quantity of lemonade she has few workers and her equipment is not being fully utilized. Because she can easily put her idle resources to use,</p> <p>A. the marginal cost of an extra worker is large. B. the marginal product of an extra worker is small. C. The marginal cost of one more glass of lemonade is small. D. Her lemonade stand is likely to be crowded with workers.</p> <p>7. When total revenue is less than total variable cost, a firm in a competitive market will</p> <p>A. shut down. B. continue to operate as long as average revenue exceeds marginal cost. C. continue to operate as long as average revenue exceeds average fixed costs. D. always exit the industry.</p> <p>8. In a competitive market, a firm's supply curve dictates the amount it will supply. In a monopoly market</p> <p>A. the same is true. B. the decision about how much to supply is impossible to separate from the demand curve it faces.</p>					
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考試科目	經濟學	系所別	商學院共同科	考試時間	2月2日(五)第一節
------	-----	-----	--------	------	------------

- C. the supply curve conceptually makes sense, but in practice is never used.
 D. the supply curve will have limited predictive capacity.
9. Equilibrium quantity in markets characterized by oligopoly are
 A. lower than in monopoly markets and higher than in perfectly competitive markets.
 B. lower than in monopoly markets and lower than in perfectly competitive markets.
 C. higher than in monopoly markets and higher than in perfectly competitive markets.
 D. higher than in monopoly markets and lower than in perfectly competitive markets.
10. In the long run, a profit-maximizing firm in a monopolistically competitive market operates at
 A. efficient scale.
 B. the point where demand equals marginal cost.
 C. the point where revenue is also maximized.
 D. some point along the downward sloping portion of its average total cost curve.
11. Which of the following statements is correct if a country has adopted fixed exchange rate regime?
 A. If the currency is overvalued with respect to the fixed parity, the central bank has to intervene e.g. by increasing the interest rate.
 B. The central bank has to offset the effects of capital outflow on the exchange rate e.g. by buying domestic currency and paying with foreign reserves.
 C. If, in order to reduce excess supply of the domestic currency, the central bank buys domestic currency at the target exchange rate, this will necessarily cause inflation in the home country.
 D. Measures taken by the central bank to keep the exchange rate fixed will not affect the domestic interest rate.
12. Take a graph with the unemployment rate on the horizontal axis and the inflation rate on the vertical axis. Which of the following will shift the Phillips curve towards the northeast?
 A. A positive aggregate demand shock
 B. Contractionary monetary policy
 C. A negative aggregate supply shock
 D. A decrease in expected inflation

備

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<p>13. Which of the following statements is necessarily false:</p> <p>A. Monetary policy can be conducted through open market operations, setting the minimum reserve requirement and through changing the refinancing rate at which banks can borrow money from the central bank.</p> <p>B. In the short run, an increase in money supply causes a proportional increase in prices. Over time the latter decrease again.</p> <p>C. Unemployment benefits are automatic stabilizers.</p> <p>D. The positive effect of expansionary fiscal policy on production is reduced by crowding out.</p> <p>14. According to the theory of sticky wages:</p> <p>A. prices adjust slowly to a decrease in nominal wages. Firms face lower wages and since prices stay high they increase the level of production and thus employment. This results in higher aggregate supply.</p> <p>B. wages adjust slowly to a decrease in prices. Firms face lower prices and since the costs of production stay high they have to decrease production and thus employment. This decreases aggregate supply.</p> <p>C. not all firms immediately adjust their prices in reaction to a decrease in the price level. These firms face higher prices and thus they increase production, which increases aggregate supply.</p> <p>D. prices react more than proportionally to increases in nominal wages. Producers face higher wages, but since prices increase more than wages they want to increase production. This results in higher aggregate supply.</p> <p>15. According to the AS-AD model an increase of public investment</p> <p>A. might decrease GDP in the short run because of crowding out.</p> <p>B. decreases prices in the short run which stimulates an economic recovery.</p> <p>C. does not change long run aggregate supply.</p> <p>D. increases aggregate supply which is depicted as a shift of the AS curve to the right.</p> <p>16. Which of the following is the most important variable for judging an economy's long-run performance?</p> <p>A. growth in nominal GDP</p> <p>B. growth in real GDP</p>					
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------	-----	-----	--------	------	------------

C. growth in real GDP per capita

D. growth in potential GDP

17. Assume that the currency-deposit ratio is 32%, the required reserve-deposit ratio is 7%, the excess reserve-deposit ratio is 1%, and total money supply is \$1,320 billion. What is the amount of high-powered money?

A. \$132 billion

B. \$165 billion

C. \$330 billion

D. \$400 billion

18. When the central bank intervenes in the foreign exchange market by purchasing foreign currency, it also routinely engages in open market sales of government securities. Why?

A. it has to sell securities to acquire the necessary funds

B. to avoid a recession that may be caused by the reduction in money supply resulting from the purchase of foreign currency

C. to prevent its intervention in the foreign exchange market from having a direct effect upon the domestic money supply

D. it wants to isolate the domestic economy from foreign competition

19. According to the Baumol-Tobin transaction demand model, money demand for transactions

A. depends only on the level of income

B. depends only on the cost of illiquidity

C. varies inversely with both the interest rate and the level of income

D. increases as the interest rate decreases or income increases

20. Which are the three channels by which the Central Bank can reduce money supply?

A. buy government securities, lower reserve requirements, and lower the discount rate

B. buy government securities, raise reserve requirements, and raise the discount rate

C. buy government securities, lower reserve requirements, and raise the discount rate

D. sell government securities, raise reserve requirements, and raise the discount rate

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------	-----	-----	--------	------	------------

二、Problems and Short-essay Questions

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

1. Suppose there is a railway that runs coal-burning steam locomotives through a farming area and caused fires in the crop fields at harvest time. The crop damage from each train run is \$200. To run trains, the railway company incurs a private marginal cost of $\$100n$, where n denotes the number of train runs. For simplicity, assume there are no fixed costs. The revenue from a train run is \$400.

A. (4 points) What is the socially optimal number of train runs?

B. (4 points) How many trains would the railway company run if no compensation is required for crop damage and the transaction cost is high enough to prevent the parties from bargaining? How much profit does the company make?

C. (6 points) How many trains would the railway company run if no compensation is required for crop damage but the negotiations between the company and the farmers are free of any transaction costs? How much profit does the company make?

D. (6 points) Now assume the railway company is legally liable for the damage caused. That is, it is required to pay the farmer \$200 for each train run. How many trains would the company run? How much profit does it make?

2. There are two large countries H and F . Each country can choose its trade policy between free trade and protection. If both countries choose free trade, the welfare is (welfare of H , welfare of F) = (20, 20). If H chooses free trade but F chooses protection, according to the optimal tariff theory, F can obtain more gains from trade at the expense of H , so that (welfare of H , welfare of F) = (-20, 30). On the contrary if H chooses protection while F chooses free trade, the welfare is (welfare of H , welfare of F) = (30, -20). However, if both countries choose protection, the welfare level moves down toward that near autarky. Therefore, (welfare of H , welfare of F) = (-10, -10). Answer the following questions.

A. (10 points) If two countries choose trade policy simultaneously, what is the possible policy combination they will choose?

B. (10 points) What is the value of a bilateral trade agreement?

備

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------	-----	-----	--------	------	------------

3. Consider an economy with the following aggregate demand and aggregate supply functions:

$$\begin{cases} \text{Aggregate Demand function: } Y = 100 + 0.5 \times \frac{M}{P}, \\ \text{Aggregate Supply function: } Y = \bar{Y} + 25 \times (P - P^e), \end{cases}$$

where Y represents the output, \bar{Y} is the potential output, P is the price level, P^e is the expected price level, M is the nominal money supply. Furthermore, assume that $M = 400$ and $\bar{Y} = 200$.

A. (6 points) Compute the equilibrium price and the equilibrium output, given that the expected price level is exactly equal to the actual price level.

B. (7 points) Suppose that the central bank dramatically increases the nominal money supply to 750 while the general public maintains exactly the same expected price level, what would be the new equilibrium price and the new equilibrium output?

C. (7 points) Compute the equilibrium price and the equilibrium output if the aforementioned expansionary monetary policy of the central bank is fully anticipated by the public.

4. Consider the following structural macroeconomic model:

- Production function: $Y = F(N, K)$; $F_N > 0$, $F_K > 0$.
- Labor demand: $\frac{W}{P} = F_N(N, K)$; $F_{NN} < 0$, $F_{KK} < 0$.
- Consumption: $C = C(Y - T, r)$; $1 > C_y > 0$, $C_r < 0$.
- Investment: $I = I(r, y)$; $I_y > 0$, $I_r < 0$.
- Goods market equilibrium: $Y = C + I + G$.
- Money market equilibrium: $\frac{M}{P} = m(r, y)$; $m_r < 0$, $m_y > 0$.

The terms Y (nominal GDP), y (real GDP), N (employment level), P (price level), C (consumption), r (interest rate), I (investment) are endogenous variables while K (capital stock), W (nominal wage), T (tax), G (government purchase), M (money supply) are exogenous variables.

A. (6 points) Is there an equilibrium in this model? If so, is it unique?

B. (7 points) Is there a stable equilibrium? If instability is possible, what is the sufficient condition for instability? (7%)

C. (7 points) What are the effects of an increase in government spending on y , r and P ? What are the effects of an increase in money supply on y , r and P ? (7%)

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考試科目	統計學	系所別	國貿系 國際經濟 國際 財管 國際企管 銀行與金 錢組	考試時間	2 月 2 日(五) 第三節
------	-----	-----	-----------------------------------	------	----------------

Single choice questions (4 points each, 100 points in total) 選擇題請在答案卡上作答, 否則不予計分。

- Which of the following variables is interval-scaled?
 - Jersey numbers of soccer players
 - Phone numbers
 - Temperature
 - None of the above
- Below are summary statistics of the commissions earned (in thousand) by a sample of 15 salespersons at Super Company.

min	Q1	Q2	mean	Q3	max
20	24	31	34	41	55

Which of the following is *not* a statistic?

- mean = 34
 - median = 31
 - $(\max + \min) / 2 = 37.5$
 - None of the above.
- Consider the experiment of rolling a fair die. The possible outcomes are $\{1, 2, 3, 4, 5, 6\}$. Consider the events $A = \{1, 3, 5\}$, $B = \{4, 6\}$, $C = \{1, 2\}$. Which of the following statements is correct?
 - Events A and C are mutually exclusive.
 - Events A and B are collectively exhaustive.
 - Events A and C are dependent.
 - None of the above.
 - The manager of a toy store found that 70% of its customers shopped online and 30% shopped in physical stores. The manager also found that 60% of the online shoppers are female, and that 80% of the shoppers in physical stores are female. What is the probability that a randomly selected customer is a female who shops online?
 - 6/25
 - 7/11
 - 3/5
 - None of the above.
 - The Business Bureau conducts a survey of the quality of service offered by a sample of 155 hedge fund managers in Emerald City. The results on Service and Gender are summarized in the following table.

Gender	Service		
	Fair	Good	Excellent
female	19	21	25
male	32	28	30

Use a χ^2 statistic to test whether Service and Gender are independent. At $\alpha = 0.05$, the critical value and test statistic are

- critical value = $\chi^2_{2,0.05}$; test statistic is 0.76
 - critical value = $\chi^2_{2,0.025}$; test statistic is 0.76
 - critical value = $\chi^2_{2,0.05}$; test statistic is 1.25
 - critical value = $\chi^2_{2,0.025}$; test statistic is 1.25
- A random variable X is said to follow Lognormal(μ, σ^2) if $\log_e(X)$ follows $N(\mu, \sigma^2)$ distribution. The probability density function of Lognormal(μ, σ^2) is
 - $\frac{x}{\sqrt{2\pi\sigma}} \exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right)$
 - $\frac{1}{\sqrt{2\pi\sigma x}} \exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right)$
 - $\frac{x}{\sqrt{2\pi\sigma}} \exp\left(-\frac{(\log_e(x)-\mu)^2}{2\sigma^2}\right)$
 - $\frac{1}{\sqrt{2\pi\sigma x}} \exp\left(-\frac{(\log_e(x)-\mu)^2}{2\sigma^2}\right)$
 - None of the above.

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考試科目	統計學	系所別	國貿系國際經濟·國際 財管·國際企管與行銷組	考試時間	2月2日(五)第三節
------	-----	-----	---------------------------	------	------------

7. Let the joint probability density function of (X, Y) be $f(x, y) = ce^{-y/2}$, $0 < x < y < \infty$. What is the value of c ?
- 2
 - 1
 - 1/2
 - 1/4
 - None of the above.
8. (cont'd) Obtain $f(x|y)$, the conditional probability density of X given Y .
- $\frac{1}{2}e^{-x/2}$, $x > 0$.
 - $\frac{1}{2}e^{-(y-x)/2}$, $0 < x < y < \infty$.
 - $\frac{1}{y}$, $0 < x < y < \infty$.
 - None of the above.
9. Super Mobile wishes to set a minimum life guarantee on its new adapter. Quality testing on 10,000 randomly selected items shows that 50 are not working at all, and the time to failure for the remaining items follows an exponential distribution with a mean of 5,000 hours. Super Mobile wants to set a warranty period such that only 5% of the adapter fail during that period. The warranty period should be set as
- $-5000 * \log_e(0.055)$
 - $-5000 * \log_e(0.045)$
 - $-5000 * \log_e(0.945)$
 - $-5000 * \log_e(0.955)$
 - None of the above.
10. The manager of a shoe store designed an incentive plan for salespeople. To test whether the incentive plan helps to increase the salesperson's mean weekly income, 20 salespeople were randomly selected and their weekly incomes before and after the plan were recorded. Let X_1, \dots, X_{20} be the incomes before the plan and Y_1, \dots, Y_{20} be the incomes after the plan. Let $D_i = X_i - Y_i$ for $i = 1, \dots, 20$. What assumptions are needed to conduct a paired t -test?
- X_i 's are i.i.d. $N(\mu_x, \sigma_x^2)$ and Y_i 's are i.i.d. $N(\mu_y, \sigma_y^2)$.
 - X_i 's are i.i.d. $N(\mu_x, \sigma^2)$ and Y_i 's are i.i.d. $N(\mu_y, \sigma^2)$.
 - D_i 's are i.i.d. $N(\mu_d, \sigma_d^2)$.
 - None of the above.
11. The owner of Super Call Center wants to investigate whether the mean waiting times (in seconds) at stores A, B and C are the same. Suppose that the waiting times at A, B and C are independent and follow $N(\mu_a, \sigma^2)$, $N(\mu_b, \sigma^2)$, and $N(\mu_c, \sigma^2)$. The results of a random sample of 12 customers are below. What are the test statistic and critical value at level α ?
- | | | | | |
|---|----|----|----|----|
| A | 10 | 9 | 14 | 11 |
| B | 11 | 21 | 12 | 16 |
| C | 12 | 16 | 11 | 13 |
- test statistic is F ; critical value is $F_{\frac{\alpha}{3}, 2, 9}$.
 - test statistic is F ; critical value is $F_{\alpha, 2, 9}$.
 - test statistic is χ^2 ; critical value is $\chi_{\frac{\alpha}{3}, 6}^2$.
 - test statistic is χ^2 ; critical value is $\chi_{\alpha, 6}^2$.
12. (cont'd) The observed test statistic is
- 1.6
 - 1.78
 - 2.5
 - 3.68
 - None of the above.

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------	-----	-----	---------------------------	------	------------

13. (cont'd) The estimate of σ^2 is
- 10
 - 3.16
 - 2.5
 - 0.35
 - None of the above.
14. Super Software purchases DVDs from DVD Global. They have agreed that the acceptable quality level is 1% defectives and the unacceptable level is 4%. They have also decided to sample 100 DVDs at random from each large batch and to reject the batch if more than 2 defectives are found. Let π be the true defective rate and X be the number of defective DVDs found in the 100 DVDs.
- The producer's risk is $P(X \geq 2 | \pi = 0.01)$.
 - The consumer's risk is $P(X \geq 2 | \pi = 0.04)$.
 - The producer's risk is Type II Error.
 - None of the above.
15. The Department of Labor reports that the median monthly salary of new college graduates is 25,000 NTD. A group of recent graduates believe this amount is too low. To conduct a statistical test, they take a random sample of 200 new college graduates and find that 112 began with a monthly salary of more than 25,000 NTD, four with exactly 25,000 NTD. Which of the following statements is correct?
- H_0 : median = 25,000 vs H_1 : median < 25,000
 - The observed test statistic is $z = \frac{112 - 98 + 0.5}{0.5 \cdot \sqrt{196}}$.
 - The observed test statistic is $z = \frac{112 - 100 - 0.5}{0.5 \cdot \sqrt{200}}$.
 - None of the above.
16. The manager of a large coffee shop chain studied the relation between sales (y) and the following variables: x_1 = population of the region, x_2 = advertising expense, x_3 = number of competitors in the region, x_4 = average income of the region. Consider the regression model: $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + e$, where $e \sim N(0, \sigma^2)$. Part of the regression output based on a random sample of 25 stores is given below. The manager also found that the sum of squares due to regression is 124, and the sum of squares due to residuals is 40. What is the regression equation?
- | | Coef | SE Coef | t |
|-----------|-------|---------|------|
| Intercept | | 7.15 | 9.80 |
| x_1 | | 0.02 | 6.50 |
| x_2 | | 0.58 | 2.50 |
| x_3 | -0.12 | 0.07 | |
| x_4 | 1.84 | 0.60 | |
- $\hat{y} = 70.07 + 0.13x_1 + 1.45x_2 - 1.71x_3 + 3.06x_4$
 - $\hat{y} = 70.07 + 0.13x_1 + 1.45x_2 - 0.12x_3 + 1.84x_4$
 - $\hat{y} = 9.80 + 6.50x_1 + 2.50x_2 - 1.71x_3 + 3.06x_4$
 - $\hat{y} = 7.15 + 0.02x_1 + 0.58x_2 + 0.07x_3 + 0.60x_4$
 - None of the above.
17. (cont'd) We want to test whether β_1 is greater than zero. At $\alpha = 0.01$, what is the critical value of this test?
- $t_{0.01, 20}$
 - $t_{0.01, 24}$
 - $t_{0.005, 20}$
 - $t_{0.005, 24}$
 - None of the above.
18. (cont'd) Consider $H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$ vs H_1 : not all β_i 's are zero. The p -value and observed test statistic are
- $p\text{-value} = P(F_{5, 20} > F_{\text{obs}})$ with $F_{\text{obs}} = 12.4$
 - $p\text{-value} = P(F_{4, 20} > F_{\text{obs}})$ with $F_{\text{obs}} = 15.5$
 - $p\text{-value} = 2P(F_{5, 20} > F_{\text{obs}})$ with $F_{\text{obs}} = 12.4$
 - $p\text{-value} = 2P(F_{4, 20} > F_{\text{obs}})$ with $F_{\text{obs}} = 15.5$
 - None of the above.

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------	-----	-----	------------------------	------	------------

19. (cont'd) What is the proportion of variation in sales that can be explained by the four explanatory variables ?
- 0.34
 - 0.65
 - 0.86
 - None of the above.
20. A smartphone manufacturer would like to study the relation between sales (y) and seasons (Q1, Q2, Q3, and Q4), where Q_i represents the i th quarter. Which of the following model specifications is appropriate?
- $y = \beta_0 + \beta_1 x + e$, where $x = 1, 2, 3, 4$ for Q1, Q2, Q3, and Q4, respectively
 - $y = \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + e$, where (1) $x_1 = 1$ for Q1, and 0 otherwise, (2) $x_2 = 1$ for Q2, and 0 otherwise, (3) $x_3 = 1$ for Q3, and 0 otherwise.
 - $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + e$, where (1) $x_1 = 1$ for Q2, and 0 otherwise, (2) $x_2 = 1$ for Q3, and 0 otherwise, (3) $x_3 = 1$ for Q4, and 0 otherwise.
 - $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + e$, where (1) $x_1 = 1$ for Q1, and 0 otherwise, (2) $x_2 = 1$ for Q2, and 0 otherwise, (3) $x_3 = 1$ for Q3, and 0 otherwise, (4) $x_4 = 1$ for Q4, and 0 otherwise.

21. The manager of an Internet company wants to conduct A/B testing to increase the amount of time users spend on their website. The team created a modified version of the original page. Then, the original webpage and the modified one (called A and B, respectively) are shown to similar users. The manager would like to test whether the modified version keeps users on the website longer. The following table shows the amount of time (in seconds) a random sample of 24 users spend on their website. Are these two samples independent or paired?

A (original)	320	290	421	510	210	402	625	560	360	431	506	505
B (modified)	340	285	475	510	210	500	631	560	365	431	525	619

- independent
 - paired
22. (cont'd) Assume that the two populations are normally distributed. The sample standard deviations for these two samples are $s_a = 120$ and $s_b = 131$, respectively. Suppose that we are to test whether there is a significant difference in the variances of the two populations; that is, $H_0 : \sigma_a = \sigma_b$ vs $H_1 : \sigma_a \neq \sigma_b$. The observed test statistic is $F_{obs} = s_b^2/s_a^2 = 1.19$. At $\alpha = 0.05$, which of the following statements is correct?
- Reject H_0 if $\{F_{obs} > F_{0.975, 11, 11}\}$.
 - Reject H_0 if $\{F_{obs} < F_{0.025, 11, 11}\}$.
 - Reject H_0 if $\{F_{obs} > F_{0.95, 11, 11}\}$.
 - Reject H_0 if $\{F_{obs} > F_{0.975, 2, 22}\}$.
 - Reject H_0 if $\{F_{obs} < F_{0.025, 2, 22}\}$.
23. (cont'd) Now we construct an one-way ANOVA table for this data. What is the computed F value?
- 0.25
 - 0.58
 - 0.95
 - 1.65
24. (cont'd) For this one-way ANOVA table, what hypothesis testing is this F value for?
- $H_0 : \sigma_a = \sigma_b$ vs $H_1 : \sigma_a \neq \sigma_b$
 - $H_0 : \sigma_a \leq \sigma_b$ vs $H_1 : \sigma_a > \sigma_b$
 - $H_0 : \mu_a = \mu_b$ vs $H_1 : \mu_a \neq \mu_b$
 - $H_0 : \mu_a \leq \mu_b$ vs $H_1 : \mu_a > \mu_b$
25. The table below shows the actual sales (\$ million) in 2017 and the Seasonal Index of the sales based on the past 5 years for DVD Global. Which of the following statements is correct?

Quarter	Q1	Q2	Q3	Q4
2017 sales	5.9	7.2	10.3	8.5
Seasonal Index	0.70	0.98	1.41	0.91

- The deseasonalized sales for Q1 of 2017 is $5.9+0.7 (=6.6)$.
- The deseasonalized sales for Q1 of 2017 is $5.9-0.7 (=5.2)$.
- The deseasonalized sales for Q1 of 2017 is $5.9*0.7 (=4.13)$.
- The deseasonalized sales for Q1 of 2017 is $5.9/0.7 (\approx 8.43)$.

備

註

- 作答於試題上者，不予計分。
- 試題請隨卷繳交。

考試科目	微積分	系所別	國貿系國際經濟·國際 財管·國際企管與行銷組	考試時間	2月2日(星期五) 第三節
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Multiple choice questions (4 points each). 選擇題請在答案卡上作答，否則不予計分。

- Let $f(x) = x^3 - 3x + 2$. Which of the following statements is true?
 - $f'(0) \leq 1$ and $f''(0) \leq 1$.
 - $f'(0) \leq 1$ and $f''(0) > 1$.
 - $f'(0) > 1$ and $f''(0) \leq 1$.
 - $f'(0) > 1$ and $f''(0) > 1$.
 - $f'(0)$ does not exist.
- Let $f(x) = e^x \cos(x)$. Which of the following statements is true?
 - $f'(0) \leq 1$ and $f''(0) \leq 1$.
 - $f'(0) \leq 1$ and $f''(0) > 1$.
 - $f'(0) > 1$ and $f''(0) \leq 1$.
 - $f'(0) > 1$ and $f''(0) > 1$.
 - $f'(0)$ does not exist.
- Suppose that f is a differentiable function on $(-\infty, \infty)$ such that $f(1) = 1$ and $f'(1) = 2$. Let $h(x) = x/f(x^2)$ for $x \in (-\infty, \infty)$. Which of the following statements is true?
 - $h'(1) \leq 1$.
 - $1 < h'(1) \leq 2$.
 - $2 < h'(1) \leq 3$.
 - $h'(1) > 3$.
 - $h'(1)$ may or may not exist.
- Suppose that f is a differentiable function on $(-\infty, \infty)$ such that $f(1) = 1$ and $f'(1) = 2$. Let $h(x) = f(f(x)) + \ln(x)$ for $x > 0$. Which of the following statements is true?
 - $h'(1) \leq 1$.
 - $1 < h'(1) \leq 2$.
 - $2 < h'(1) \leq 3$.
 - $h'(1) > 3$.
 - $h'(1)$ may or may not exist.
- Let $f(x) = x + \sin(x)$ and $g(x) = x + \cos(x)$. Which of the following statements is true?
 - $-\infty < \lim_{x \rightarrow \infty} g(x)/f(x) \leq 1$.
 - $1 < \lim_{x \rightarrow \infty} g(x)/f(x) \leq 2$.
 - $2 < \lim_{x \rightarrow \infty} g(x)/f(x) \leq 3$.
 - $3 < \lim_{x \rightarrow \infty} g(x)/f(x) < \infty$.
 - $\lim_{x \rightarrow \infty} g(x)/f(x)$ does not exist.

備

註

- 作答於試題上者，不予計分。
- 試題請隨卷繳交。

考試科目	微積分	系所別	國貿系國際經濟、國際 財管、國際企管、銀行組	考試時間	2月2日(星期五)第三節
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6. Let $f(x) = \sin(x - 3)$ and $g(x) = \ln(x - 3)$. Which of the following statements is true?

- (a) $\lim_{x \rightarrow 3^+} f(x)g(x)$ does not exist.
- (b) $-\infty < \lim_{x \rightarrow 3^+} f(x)g(x) \leq -3$.
- (c) $-3 < \lim_{x \rightarrow 3^+} f(x)g(x) \leq -1$.
- (d) $-1 < \lim_{x \rightarrow 3^+} f(x)g(x) \leq 1$.
- (e) $1 < \lim_{x \rightarrow 3^+} f(x)g(x) < \infty$.

7. Let $f(x) = x \ln(1 + x)$ and $g(x) = x \ln(x)$ for $x > 0$. Which of the following statements is true?

- (a) $\lim_{x \rightarrow \infty} (f(x) - g(x))$ does not exist.
- (b) $3 < \lim_{x \rightarrow \infty} (f(x) - g(x)) < \infty$.
- (c) $0 < \lim_{x \rightarrow \infty} (f(x) - g(x)) \leq 3$.
- (d) $-3 < \lim_{x \rightarrow \infty} (f(x) - g(x)) \leq 0$.
- (e) $-\infty < \lim_{x \rightarrow \infty} (f(x) - g(x)) \leq -3$.

8. Suppose that $f'(x) = xe^x$ for $x \in (-\infty, \infty)$. Which of the following statements is true?

- (a) f is strictly increasing on the interval $(-1, \infty)$.
- (b) f is strictly decreasing on the interval $(0, \infty)$.
- (c) f has a minimum on the interval $(-1, \infty)$.
- (d) f has a maximum on the interval $(0, \infty)$.
- (e) None of the above statements holds true.

9. Let $f(x) = x^2 - \int_0^x t \cos(t) dt$ for $x \in (-\infty, \infty)$. Which of the following statements is true?

- (a) $f'(\pi/2) \leq -2$.
- (b) $-2 < f'(\pi/2) \leq -1$.
- (c) $-1 < f'(\pi/2) \leq 0$.
- (d) $f'(\pi/2) > 0$.
- (e) None of the above statements holds true.

10. Let $f(x) = x^2 - \int_0^x t \cos(t) dt$ for $x \in (-\infty, \infty)$. Which of the following statements is true?

- (a) $\lim_{x \rightarrow 0} f(x)/x$ does not exist.
- (b) $-\infty < \lim_{x \rightarrow 0} f(x)/x \leq 1$.
- (c) $1 < \lim_{x \rightarrow 0} f(x)/x \leq 2$.
- (d) $2 < \lim_{x \rightarrow 0} f(x)/x \leq 3$.
- (e) $3 < \lim_{x \rightarrow 0} f(x)/x < \infty$.

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	國貿系 國際經濟 國際 財管 國際企管 銀行金融組	考試時間	2月2日(星期五) 第三節
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11. Which of the following statements is true?

- (a) $\int_0^1 x^{-2} dx \leq 0.5$ and $\int_0^\infty e^{-x} dx \leq 1$.
 (b) $\int_0^1 x^{-2} dx \leq 0.5$ and $\int_0^\infty e^{-x} dx > 1$.
 (c) $0.5 < \int_0^1 x^{-2} dx \leq 2$ and $\int_0^\infty e^{-x} dx \leq 1$.
 (d) $0.5 < \int_0^1 x^{-2} dx \leq 2$ and $\int_0^\infty e^{-x} dx > 1$.
 (e) None of the above statements holds true.

12. Suppose that $\{a_n\}_{n=1}^\infty$ is a sequence such that $a_1 = 1$ and $a_{n+1} = 0.5a_n + n^2$ for $n \geq 1$. Which of the following statements is true?

- (a) $-\infty < \lim_{n \rightarrow \infty} a_n \leq 0$.
 (b) $0 < \lim_{n \rightarrow \infty} a_n \leq 1$.
 (c) $1 < \lim_{n \rightarrow \infty} a_n \leq 2$.
 (d) $2 < \lim_{n \rightarrow \infty} a_n < \infty$.
 (e) None of the above statements holds true.

13. Which of the following statements is true?

- (a) $0 \leq \sum_{n=1}^\infty 3^{-n} \leq 1$.
 (b) $1 < \sum_{n=1}^\infty 3^{-n} \leq 2$.
 (c) $2 < \sum_{n=1}^\infty 3^{-n} \leq 3$.
 (d) $3 < \sum_{n=1}^\infty 3^{-n} < \infty$.
 (e) None of the above statements holds true.

14. Which of the following statements is true?

- (a) $\sum_{n=1}^\infty (n+1)/(2n^3 + n + 1) < \infty$ and $\sum_{n=1}^\infty (-1)^n \cdot n$ diverges.
 (b) $\sum_{n=1}^\infty (n+1)/(2n^3 + n + 1) < \infty$ and $\sum_{n=1}^\infty (-1)^n \cdot n$ converges conditionally.
 (c) $\sum_{n=1}^\infty (n+1)/(2n^3 + n + 1) = \infty$ and $\sum_{n=1}^\infty (-1)^n \cdot n$ diverges.
 (d) $\sum_{n=1}^\infty (n+1)/(2n^3 + n + 1) = \infty$ and $\sum_{n=1}^\infty (-1)^n \cdot n$ converges conditionally.
 (e) $\sum_{n=1}^\infty (-1)^n \cdot n$ converges absolutely.

15. Let $a_n = (n!)^2$ and $b_n = n^2$. Which of the following statements is true?

- (a) $\sum_{n=1}^\infty b_n/a_n < \infty$ and $\sum_{n=1}^\infty (-1)^n/n$ diverges.
 (b) $\sum_{n=1}^\infty b_n/a_n < \infty$ and $\sum_{n=1}^\infty (-1)^n/n$ converges conditionally.
 (c) $\sum_{n=1}^\infty b_n/a_n = \infty$ and $\sum_{n=1}^\infty (-1)^n/n$ diverges.
 (d) $\sum_{n=1}^\infty b_n/a_n = \infty$ and $\sum_{n=1}^\infty (-1)^n/n$ converges conditionally.
 (e) $\sum_{n=1}^\infty (-1)^n/n$ converges absolutely.

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	國貿系、國際經濟、國際 財管、國際企管與行銷組	考試時間	2月2日(星期五) 第三節
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16. Let $f_n(x) = \sum_{k=1}^n kx^{k-1}$ for $x \in (-\infty, \infty)$. Which of the following statements is true?

- (a) $\lim_{n \rightarrow \infty} f_n(x)$ exists for every $x \in (-\infty, \infty)$.
- (b) $\lim_{n \rightarrow \infty} f_n(x)$ does not exist if $|x| > 0.5$.
- (c) $\lim_{n \rightarrow \infty} f_n(x)$ does not exist if $|x| > 1$.
- (d) $\lim_{n \rightarrow \infty} f_n(x)$ does not exist if $x \neq 0$.
- (e) None of the above statements holds true.

17. Let $f_n(x) = 1 + \sum_{k=1}^n x^k/k$ for $n \geq 1$. Let $S = \{x : \lim_{n \rightarrow \infty} f_n(x) \text{ exists}\}$ and $f(x) = \lim_{n \rightarrow \infty} f_n(x)$ for $x \in S$. Which of the following statements is true?

- (a) $0.5 \notin S$.
- (b) $0.5 \in S$ and $f'(0.5)$ does not exist.
- (c) $0.5 \in S$ and $f'(0.5) < 2$.
- (d) $0.5 \in S$ and $f'(0.5) > 2$.
- (e) $0.5 \in S$ and $f'(0.5) = 2$.

18. Let $f(x, y) = \sin(xy) + 2x + y$ for $x, y \in (-\infty, \infty)$. Which of the following statements is true?

- (a) $f_x(0, 2) > 1$ and $f_{xx}(0, 2) > 5$.
- (b) $f_x(0, 2) > 1$ and $f_{xx}(0, 2) \leq 5$.
- (c) $f_x(0, 2) \leq 1$ and $f_{xx}(0, 2) > 5$.
- (d) $f_x(0, 2) \leq 1$ and $f_{xx}(0, 2) \leq 5$.
- (e) None of the above statements holds true.

19. Let $f(x, y) = \int_y^x \frac{y}{2y+t} dt$ for $0 < y < x$. Which of the following statements is true?

- (a) $f_x(2, 1) > 0.5$ and $f(x, y) > 0$ for $0 < y < x$.
- (b) $f_x(2, 1) > 0.5$ and $f(x, y) < 0$ for $0 < y < x$.
- (c) $f_x(2, 1) < 0$ and $f(x, y) > 0$ for $0 < y < x$.
- (d) $f_x(2, 1) < 0$ and $f(x, y) < 0$ for $0 < y < x$.
- (e) $0 \leq f_x(2, 1) \leq 0.5$.

20. Let $f(x, y) = xy + x + y$ for $x, y \in (-\infty, \infty)$, $D_1 = \{(x, y) : 0 \leq x \leq 1 \text{ and } 0 \leq y \leq 1\}$ and $D_2 = \{(x, y) : x > 0, y > 0 \text{ and } x^2 + y^2 \leq 1\}$. Which of the following statements is true?

- (a) $\int_{D_1} f(x, y)d(x, y) \leq 1$ and $\int_{D_2} f(x, y)d(x, y) > \int_{D_1} f(x, y)d(x, y)$.
- (b) $\int_{D_1} f(x, y)d(x, y) > 1$ and $\int_{D_2} f(x, y)d(x, y) > \int_{D_1} f(x, y)d(x, y)$.
- (c) $\int_{D_1} f(x, y)d(x, y) \leq 1$ and $\int_{D_2} f(x, y)d(x, y) \leq \int_{D_1} f(x, y)d(x, y)$.
- (d) $\int_{D_1} f(x, y)d(x, y) > 1$ and $\int_{D_2} f(x, y)d(x, y) \leq \int_{D_1} f(x, y)d(x, y)$.
- (e) None of the above statements holds true.

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	國貿系國際經濟國際 財管·國際企業管理行銷組	考試時間	2月2日(星期五)第三節
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21. The equation

$$x^3y + \cos(xy) = 1$$

defines y as a differentiable function of x when (x, y) is near the point $(1, 0)$. Which of the following statements is true?

(a) $\left. \frac{dy}{dx} \right|_{(x,y)=(1,0)} \leq -2$.

(b) $-2 < \left. \frac{dy}{dx} \right|_{(x,y)=(1,0)} \leq -1$.

(c) $-1 < \left. \frac{dy}{dx} \right|_{(x,y)=(1,0)} \leq 0$.

(d) $0 < \left. \frac{dy}{dx} \right|_{(x,y)=(1,0)} \leq 1$.

(e) None of the above statements holds true.

22. Let $f(x, y) = \int_0^x u^y e^{-u} du$ for $x \in (-\infty, \infty)$, $y > 0$. Which of the following statements is true?

(a) $f_x(1, 1) > 1$.

(b) $f(-1, 1) \leq 1$.

(c) $\lim_{x \rightarrow \infty} f(x, 1) > 1$.

(d) $\lim_{x \rightarrow \infty} f(x, 2) = \infty$.

(e) None of the above statements holds true.

23. Let $D = \{(x, y) : x > 0, y > 0, 0 < x^2 + y^2 \leq 1\}$. Which of the following statements is true?

(a) $\int_D (x^2 + y^2) d(x, y) > 1$.

(b) $\int_D 2d(x, y) \leq 1$.

(c) $\int_D (x + y) d(x, y) > 1$.

(d) $\int_D xy d(x, y) \leq 1$.

(e) None of the above statements holds true.

24. Let $S_n = \sum_{k=1}^n \sin\left(\frac{k}{n}\right)$. Which of the following statements is true?

(a) $\lim_{n \rightarrow \infty} S_n$ exists and $\lim_{n \rightarrow \infty} S_n < 1$.

(b) $\lim_{n \rightarrow \infty} \sqrt{S_n}$ exists and $\lim_{n \rightarrow \infty} \sqrt{S_n} < 1$.

(c) $\lim_{n \rightarrow \infty} S_n/n$ exists and $\lim_{n \rightarrow \infty} S_n/n > 1$.

(d) $\lim_{n \rightarrow \infty} S_n/(n^2)$ exists and $\lim_{n \rightarrow \infty} S_n/(n^2) < 1$.

(e) None of the above statements holds true.

25. Let $a_n = \int_0^\pi x^n \cos(x) dx$ for $n \geq 1$. Which of the following statements is true?

(a) $a_1 > 0$.

(b) $a_2 > 0$.

(c) $a_3 > 0$.

(d) $a_4 > 0$.

(e) None of the above statements holds true.

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	商事法	系所別	國際經營與貿易學系 國際經貿法組一般生	考試時間	2 月 2 日(五)第一節
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本試題共三大題，六小題。答題詳簡，請斟酌各小題配分比重。並請備具理由，兼從正、反立論作答。

第一題 (40%)

A 股份有限公司與 B 股份有限公司簽訂合資契約，成立 C 股份有限公司（非公開發行），契約第 2 條規定：「A、B 雙方持股比例分別為 49%、51%」，契約第 5 條約定：「C 公司董事會由 7 位成員組成，4 位由 B 公司提名，3 位由 A 公司提名，A 公司指派董事長及執行副總，B 公司指派副董事長及總經理，執行董事由雙方各選 1 名組成。」以達支配公司之目的。另 C 公司章程第 15 條規定：「本公司董事長、副董事長應由超過 3 分之 2 董事出席及出席董事全數之同意選任之」。C 公司於 102 年 1 月 30 日召開董事會，董事長甲、副董事長乙，及其他 5 位董事均出席。甲於開會開始致詞時，突然表示其業務繁忙欲辭任董事長一職（但任期尚未屆滿），繼而口頭提議由董事丙擔任董事長，而甲只擔任董事，一時間與會董事不及反應，未為反對之意而通過，當次會議遂由丙擔任主席。唯查當次董事會議程並無「改選董事長」議案，而甲之提案乃開會初始為之，並非於臨時動議時提出，且會中並無 A 公司所出具的任何文件，因此，乙認為依公司法第 208 條規定：「董事長請假或因故不能行使職權時，由副董事長代理之。」應由乙代理董事長職位。然甲重申合資契約的約定，強調其並無選出新董事長之前即「先行」辭任董事長之意。嗣後 C 公司召開股東臨時會決議由監察人代表公司依公司法第 213 條規定，對丙提起確認不存在董事長委任關係之訴訟。請問：

- (一) 系爭合資契約第 5 條規定之性質為何？此等約定之效力如何？(10%)
- (二) 承上，據以說明：由甲主持改選董事長之程序是否違反公司法第 208 條第 3 項及系爭章程第 15 條規定？(20%)
- (三) 系爭董事長之改選以臨時動議方式提出，是否合法？(10%)

第二題 (30%)

A 公司於 101 年 8 月 29 日與甲簽署股權轉讓契約書，約定由 A 公司持有之 B 公司股權轉讓予甲，該等股權業於同年 11 月 19 日完成轉讓手續；A 公司嗣就價金給付問題於 102 年 3 月 25 日與甲簽署系爭補充協議書，約定變更原約定之價金金額，且增加一名保證人在甲簽發之擔保本票背書擔保。甲已簽發本票金額新台幣

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	商事法	系所別	國際經營與貿易學系 國際經貿法組一般生	考試時間	2 月 2 日(五)第一節
<p>幣 2400 萬元，記名 A 公司為受款人，並交予 A 公司收執；於交付前甲徵得 C 股份有限公司(負責人乙)同意於該本票背書，以履行增加一名保證人之要求。今 A 公司對甲之財產強制執行無效果，爰依前開補充協議書之保證約定，請求 C 公司負保證責任，清償此價金債務。經查本件股權買賣主要由乙負責統籌，甲為乙之朋友，受乙委託以其名義出面簽約購買股權，乙亦為 C 公司之董事。另查 C 公司章程第 4 條規定：「本公司因業務需要，得對外保證」；章程第 3 條規定：「為達成多角化經營之目標，本公司轉投資其他公司之投資總額得超過本公司實收股本 40%」。請問：C 公司可否以：(1) 其與 A 公司間並未成立保證契約，或 (2) 縱使成立，該契約亦違反公司法第 16 條第 1 項規定而無效，或 (3) 因系爭本票背書不連續等理由，拒絕 A 公司之請求？請分就前開三點理由扼要分析之。(30%)</p> <p>第三題 (30%)</p> <p>A 科技公司將電腦伺服器零件交由其下屬關係企業 B-1 公司進行加工，並於 102 年 12 月間，代其將該等加工後之零件(即系爭貨物)，裝載於兩只貨櫃後，委由 C 物流公司(運送人)以 M 海運公司(實際運送人)承租艙位之巴拿馬籍船舶，自荷蘭鹿特丹運至美國費利蒙，交付位於當地同為 A 公司下屬子公司之 B-2 公司收受，惟系爭貨物竟於 C 公司承運途中因遇低壓風暴落海滅失而遭致全損，而系爭貨物事前即經 A 公司向 D 產物保險公司投保財產保險，唯 D 公司為分散風險，經 A 公司同意將原單獨承保之保單，變更為由 D 公司、E 公司、N 公司及 S 公司等保險公司共同承保。前開貨損事故發生後，A 公司遂向 D 公司申請保險理賠，D 公司亦已依保險契約約定，賠償 A 公司新臺幣 1600 萬元。今 D 公司向法院請求擇一判命 C 公司及 M 海運公司給付前開金額。設若本案管轄法院及準據法均為我國法院及海商法等法律，請問：</p> <p>(一) D 產物保險公司得否以自己之名義對 C 公司及 M 公司提起訴訟？如 C 公司及 M 公司辯稱因系爭保險契約屬共保契約，D 公司不得單獨代位請求賠償，是否有理由？(15%)</p> <p>(二) D 產物保險公司請求 C 公司及 M 公司就系爭貨物滅失負損害賠償責任是否有理由？C 公司及 M 公司抗辯系爭貨物滅失乃因海象惡劣之天候因素所致，故無須負責，有無理由？請援引海商法相關條文分析之。(15%)</p>					
備註	<p>一、作答於試題上者，不予計分。 二、試題請隨卷繳交。</p>				

考試科目	國際貿易法	系所別	國際貿易學系/國際貿易法組	考試時間	2 月 2 日(五) 第一節
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- 一、行政院會於 2017 年 10 月通過「菸害防制法」之修正案欲從嚴管制電子菸，未來將全面禁止製造、輸入、販售及廣告電子菸，此一修正案尚待立法院審議，惟相關規定已引發許多爭議。請由 WTO 之相關規範評析此一措施。(25%)
- 二、據報載，為了推動離岸風力發電並鼓勵國內相關產業，經濟部極有可能於離岸風電遴選辦法中納入國產化或自製率的要求，此舉引發恐有違反我國於 WTO 下之義務的批評。請問自製率此一措施涉及哪些 WTO 之相關規範？(20%)
- 三、WTO 第 11 屆部長會議甫於阿根廷首都布宜諾斯艾利斯落幕，會議之前以及會議當中，美國貿易代表均對 WTO 提出許多批評，其中之一是針對其爭端解決機制表達不滿。試由 WTO 之爭端解決程序中的規定，提出妳/你對於美國貿易代表此一批評的看法。(25%)
- 四、中國入會議定書之「非市場經濟條款」於 2016 年 12 月 11 日到期，就歐盟遲未賦予中國市場經濟地位一事，中國於 2017 年 3 月 21 日向 WTO 之爭端解決機構提出成立爭端解決小組之請求，爭端解決小組亦已於 4 月 3 日成立，美國於 2017 年 11 月底所提出之第三方意見書中，首度明確表示反對在反傾銷調查中賦予中國市場經濟地位之待遇。請問此一爭議涉及 WTO 下之哪些規範？(20%)
- 五、請試譯以下條文 (10%)

1. Members shall ensure that their sanitary or phytosanitary measures are adapted to the sanitary or phytosanitary characteristics of the area — whether all of a country, part of a country, or all or parts of several countries — from which the product originated and to which the product is destined. In assessing the sanitary or phytosanitary characteristics of a region, Members shall take into account, inter alia, the level of prevalence of specific diseases or pests, the existence of eradication or control programmes, and appropriate criteria or guidelines which may be developed by the relevant international organizations.
2. Members recognize that, in certain circumstances, subsidies may have distortive effects on trade in services. Members shall enter into negotiations with a view to developing the necessary multilateral disciplines to avoid such trade-distortive effects. The negotiations shall also address the appropriateness of countervailing procedures. Such negotiations shall recognize the role of subsidies in relation to the development programmes of developing countries and take into account the needs of Members, particularly developing country Members, for flexibility in this area. For the purpose of such negotiations, Members shall exchange information concerning all subsidies related to trade in services that they provide to their domestic service suppliers.

備

註

- 一、作答於試題上者，不予計分。
- 二、試題請隨卷繳交。