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| 考試科目 | 經濟學 | 系所別 | 國貿、企管<br>風管、科管 | 考試時間 | 2月5日(五)第二節 |
|------|-----|-----|----------------|------|------------|

### Multiple Choice (1 point each)

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

- When a country allows trade and becomes an exporter of a good,
  - everyone in the country benefits.
  - everyone in the country loses.
  - the gains of the winners exceed the losses of the losers.
  - the losses of the losers exceed the gains of the winners.
- Inefficiency in monopolistically competitive markets can be identified with
  - their similarities to perfectly competitive markets.
  - not having the ideal number of firms in the industry.
  - a first-best equilibrium, where price is equal to marginal cost.
  - government programs that effectively regulate price.
- When a farmer is making a long-run decision of whether or not to exit an industry, the cost of land
  - will be considered as part of the farm's fixed cost.
  - is treated differently than the cost of machinery.
  - is not considered a sunk cost.
  - is irrelevant to the strategic decision.
- Economists compute the price elasticity of demand as
  - the percentage change in the price divided by the percentage change in quantity demanded.
  - the percentage change in the quantity demanded divided by the percentage change in price.
  - the change in quantity demanded divided by the change in the price.
  - the percentage change in the quantity demanded divided by the percentage change in income.
- Suppose you like banana cream pie made with vanilla pudding. Assuming all other things are constant, you notice that the price of bananas is higher. How would your demand for vanilla pudding be affected by this?
  - It would decrease.
  - It would increase.
  - It would be unaffected.
  - There is insufficient information given to answer the question.

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註

- 作答於試題上者，不予計分。
- 試題請隨卷繳交。

| 考試科目   | 經濟學                           | 系所別 | 國貿、企管<br>風管、科管 | 考試時間 | 2月5日(五)第二節 |
|--|-------------------------------|-----|----------------|------|------------|
| <p>6. Jack's Hotdogs is a small street vendor business. The owner is trying to get a better understanding of his costs by categorizing them as fixed or variable. Which of the following costs are most likely to be considered fixed costs?</p> <p>A. the cost of ketchup<br/>           B. the cost of hotdog buns<br/>           C. wages paid to workers who sell hot dogs<br/>           D. the cost of bookkeeping services</p> <p>7. After watching a movie, Alan chooses not to watch a second and goes for a walk instead. Economists could explain his choices using the concept of</p> <p>A. budget constraints.<br/>           B. diminishing marginal utility.<br/>           C. income effect.<br/>           D. substitution effect.</p> <p>8. The tragedy of the commons is the</p> <p>A. undersupply of a public good due to people not wanting to pay for a publicly common good.<br/>           B. disappearance of certain markets due to the lack of willingness to pay by individuals, leading to collective misfortune.<br/>           C. depletion of a common resource due to individually rational but collectively inefficient over-consumption.<br/>           D. notion that common resources are generally under consumed and therefore not produced by suppliers due to artificially low demand.</p> <p>9. The more firms there are in a market, the</p> <p>A. larger will be the price effect of one firm's output decision.<br/>           B. smaller will be the price effect of one firm's output decision.<br/>           C. more collusion is likely to happen.<br/>           D. price effect must outweigh the output effect.</p> <p>10. Ethan enjoys buying books and going to the movies. He has income of \$150 to spend on these two goods each month. The price of a book is \$15 and the price of going to the movies is also \$15. He currently consumes four books and six movies a month. If the price of a book increases to \$20, then,</p> <p>A. the substitution and income effects would both predict Ethan would consume more of both goods.</p> |                               |     |                |      |            |
| 備註   | 一、作答於試題上者，不予計分。<br>二、試題請隨卷繳交。 |     |                |      |            |

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| <p>B. the substitution and income effects would both predict Ethan would consume less of both goods.</p> <p>C. the substitution effect would predict Ethan would consume more books and less movies, and the income effect would predict he would consume less of both.</p> <p>D. the substitution effect would predict Ethan would consume less books and more movies and the income effect would predict he would consume less of both.</p> <p>11. The rise of the price of imported goods</p> <p>A. will directly affect GDP deflator.</p> <p>B. will directly affect CPI.</p> <p>C. will directly affect both GDP deflator and CPI.</p> <p>D. will not directly affect both GDP deflator and CPI.</p> <p>12. What is not a possible reason if a government prints money to stimulate the economy, but the unemployment rate keeps the same?</p> <p>A. Nationals are fully rational.</p> <p>B. There are no menu costs.</p> <p>C. The money multiplier is greater than 1 but smaller than 2.</p> <p>D. The short-run Phillippe curve is a vertical line.</p> <p>13. Country A only has 5 people. The current unemployment rate is 25%. Which statement of the followings is wrong?</p> <p>A. There is no discourage worker.</p> <p>B. One of them might be a full-time student.</p> <p>C. Two of them have no jobs and are seeking for jobs.</p> <p>D. There is one discouraged worker.</p> <p>14. Which policy of the followings is not a possible solution for the rising housing prices?</p> <p>A. Central banks sell government bonds through open market operations.</p> <p>B. Central banks cut the discount rate.</p> <p>C. Central banks raise the reserve requirements.</p> <p>D. Central banks set a mortgage cap.</p> |  |     |                |      |            |
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|------|-----|-----|----------------|------|------------|

15. The marginal propensity of saving in Country A is 0.5. Currently, the country is suffered from COVID-19 and the government gives 3000 local dollars to every national. Suppose due to this policy, each national can help to increase money supply 2000 local dollars through the fractional-reserve banking system. What is the reserve ratio for Country A?

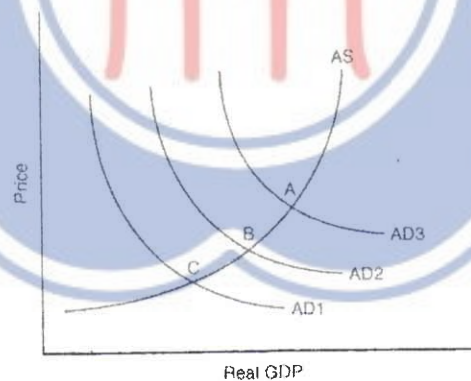
- A. 20%
- B. 30%
- C. 40%
- D. 50%

16. Stagflation occurs when

- A. real GDP increases and price levels decrease.
- B. real GDP decreases and price levels decrease.
- C. unemployment and price levels increase.
- D. nominal GDP decreases and price levels increase.

17. The multiplier effect will be greater on aggregate demand if

- A. there is no increase in the price level.
- B. both aggregate demand and aggregate supply increase.
- C. both aggregate demand and aggregate supply decrease.
- D. aggregate demand increases and aggregate supply decreases.



18. According to the preceding diagram, the economy is at equilibrium at Point A. Choose the best fiscal policy most appropriate to control demand-pull inflation.

- A. Decrease aggregate demand by increasing taxes.
- B. Increase aggregate demand by decreasing taxes.
- C. Decrease aggregate supply by increasing taxes.
- D. Increase aggregate demand by increasing government spending.

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|------|-----|-----|----------------|------|------------|

19. The crowding out effect may be avoided if
- the government pursues a contractionary fiscal policy.
  - the government destroys a percentage of the money supply.
  - the government issues new money.
  - A and C.
20. A disadvantage of a floating exchange rate is that
- trade may worsen due to a nation's depreciation of its currency.
  - tariffs cease to be effective.
  - exports decrease.
  - imports decrease.

### Problems and Short-essay Questions

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

1. Let the inverse demand function of good  $x$  in a country be  $P_x = 5 - D_x$ , where  $P_x$  is the price of  $x$  and  $D_x$  is the quantity demanded. The quantity supplied is  $Q_x$  and the inverse supply function is  $P_x = 3 + Q_x$ . Answer the following questions.
- (4 points) Derive the equilibrium price under autarky.
  - (8 points) Suppose the country is small. The price of  $x$  in the international market is 3. Will the country import or export  $x$ ? Calculate the quantity of export or import.
  - (8 points) Calculate the consumer and producer surplus under autarky and trade. Measure the gains from trade in terms of surplus.
2. The inverse market demand curve for a final good is  $p = 100 - Q$  and the marginal cost of supplying labor is  $MC_L = 40$ . Each unit of output requires half unit of labor,  $L$ , and no other factor. That is,  $Q = 2L$ .
- (4 points) If the factor market is perfectly competitive and the output market is a monopoly, what are the equilibrium quantity and price in both factor and output markets?
  - (10 points) If both the factor and output markets are a monopoly, what are the equilibrium quantity and price in these two markets? How much profit does each firm make?
  - (6 points) Show that a vertical merger of the upstream and downstream monopoly increases profit and benefits consumers.

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|------|-----|-----|----------------|------|------------|

3. Country A's Phillips curve can be written as:

$$u = u_{natural} = 0.5(\pi - x),$$

where  $u$  is the unemployment rate,  $u_n$  is the natural unemployment rate, and  $\pi$  is the current inflation rate. Please answer the following questions in detail.

A. (5 points) What does  $x$  stand for?

B. (5 points) Suppose Country A's structural unemployment rate is 3%, frictional unemployment rate is 2%, and cyclical unemployment rate is 1%. Please calculate the inflation rate, given  $x$  equals 1%.

C. (5 points) Following (B), suppose Country A announces to set an 3% inflation target in the coming year. Under the assumption of rational expectation and other things remaining the same, what will the current unemployment rate change?

D. (5 points) Following (C), suppose the government does not want to hurt the investment and the current nominal interest rate is 4%. What is the ideal nominal interest rate in the coming year?

4. Imagine an open economy in which Ricardian equivalence holds. This economy has a budget deficit of 50, a trade deficit of 20, and investment of 100.

A. (6 points) Define Ricardian equivalence.

B. (7 points) What is the level of private savings in this economy?

C. (7 points) If the budget deficit rises to 70, how are private savings affected?

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| 考 試 科 目 | 統計學 | 系 所 別 | 企業管理研究所 | 考 試 時 間 | 2 月 5 日(五) 第 4 節 |
|---------|-----|-------|---------|---------|------------------|

*Note: Use the level of significance 0.05 for the test of hypothesis if required.*

1. (35%) 下表為各縣市在 2020 年的「人口密度 (*PopDensity*)」與「醫療院所床數 (*HospitalBed*)」。另「直轄市 (*Municipality*)」表示若該縣市為直轄市，其值為 1 時；否則值為 0。最後兩列為觀測值的總和與觀測值的平方之總和 (平方和)。

| 縣市  | 人口密度      | 醫療院所床數     | 直轄市 |
|-----|-----------|------------|-----|
| 新北市 | 1960.29   | 19116      | 1   |
| 臺北市 | 9695.69   | 25395      | 1   |
| 桃園市 | 1846.39   | 15179      | 1   |
| 臺中市 | 1271.69   | 22024      | 1   |
| 臺南市 | 857.40    | 13245      | 1   |
| 高雄市 | 939.74    | 22573      | 1   |
| 宜蘭縣 | 211.77    | 3938       | 0   |
| 新竹縣 | 395.98    | 2918       | 0   |
| 苗栗縣 | 299.27    | 3477       | 0   |
| 彰化縣 | 1183.00   | 7978       | 0   |
| 南投縣 | 120.15    | 3408       | 0   |
| 雲林縣 | 526.83    | 3900       | 0   |
| 嘉義縣 | 263.71    | 3359       | 0   |
| 屏東縣 | 294.42    | 5801       | 0   |
| 臺東縣 | 61.53     | 1521       | 0   |
| 花蓮縣 | 70.37     | 4289       | 0   |
| 澎湖縣 | 828.58    | 550        | 0   |
| 基隆市 | 2777.91   | 3942       | 0   |
| 新竹市 | 4315.06   | 2852       | 0   |
| 嘉義市 | 4455.97   | 4007       | 0   |
| 金門縣 | 922.82    | 329        | 0   |
| 連江縣 | 452.57    | 52         | 0   |
| 總和  | 33751.14  | 169853     |     |
| 平方和 | 154576544 | 2643127703 |     |

- (a) Construct a box-and-whisker plot for *PopDensity*. Please identify which cities or counties are possible outliers based on the resulting plot. (15%)

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|-------------|---------------|---------|-------------------|
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|-------------|---------------|---------|-------------------|

Assume that *PopDensity* follows a normal distribution, and the population variances of *PopDensity* for municipal cities and non-municipal cities are equal. Answer the following questions.

- (b) Test whether the population mean of *PopDensity* is greater than 620. (8%)
- (c) Test whether the population means of *PopDensity* between municipal cities and non-municipal cities are equal or not. (12%)

2. (30%) Based on the data in Question 1, we obtain the following regression result by using *HospitalBed* as the response variable, and both *PopDensity* and *Municipality* as explanatory variables.

|                     | Estimate | Standard error |
|---------------------|----------|----------------|
| <i>Constant</i>     | 2660.16  | 746.23         |
| <i>PopDensity</i>   | 0.57     | 0.29           |
| <i>Municipality</i> | 15359.73 | 1388.89        |

Please answer the following questions.

- (a) Explain the meaning of the coefficient estimate for *Municipality*. (4%)
- (b) Identify which explanatory variable(s) are significant. (8%)
- (c) If  $s = 2720.15$  denotes the estimated standard error for regression, then complete the analysis of variance table for this regression analysis. (12%)
- (d) What is the value of the adjusted  $R^2$ ? (6%)
3. (35%) The following data show the number of defective components and the number of good components found from a random sample of 500 components with different suppliers.

| Component | Supplier |     |     |
|-----------|----------|-----|-----|
|           | A        | B   | C   |
| Defective | 15       | 20  | 40  |
| Good      | 485      | 480 | 460 |

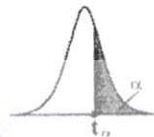
- (a) If we randomly choose 4 components from supplier C, what is the probability of including 1 defective component? (5%)
- (b) Construct a 95% confidence interval for the proportion of defective components from supplier A? (8%)

|      |     |     |         |      |                  |
|------|-----|-----|---------|------|------------------|
| 考試科目 | 統計學 | 系所別 | 企業管理研究所 | 考試時間 | 2 月 5 日(五) 第 4 節 |
|------|-----|-----|---------|------|------------------|

- (c) Test the equality between the proportion of defective components from supplier A and that proportion from supplier C. (10%)
- (d) Conduct a statistical hypothesis to test the equal proportions of defective components provided by the three suppliers. (12%)

Percentage Points of the  $t$  Distribution;  $t_{v, \alpha}$

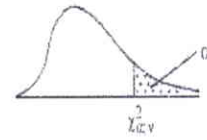
$$P(T > t_{v, \alpha}) = \alpha$$



| v        | $\alpha$ |       |       |       |       |       |        |        |        |        |        |        |         |         |
|----------|----------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|---------|---------|
|          | 0.40     | 0.30  | 0.20  | 0.15  | 0.10  | 0.05  | 0.025  | 0.02   | 0.015  | 0.01   | 0.0075 | 0.005  | 0.0025  | 0.0005  |
| 1        | 0.325    | 0.727 | 1.376 | 1.963 | 3.078 | 6.314 | 12.706 | 15.895 | 21.205 | 31.821 | 42.434 | 63.657 | 127.322 | 636.590 |
| 2        | 0.289    | 0.617 | 1.061 | 1.386 | 1.886 | 2.920 | 4.303  | 4.849  | 5.643  | 6.965  | 8.073  | 9.925  | 14.089  | 31.598  |
| 3        | 0.277    | 0.584 | 0.978 | 1.250 | 1.638 | 2.353 | 3.182  | 3.482  | 3.896  | 4.541  | 5.047  | 5.841  | 7.453   | 12.924  |
| 4        | 0.271    | 0.569 | 0.941 | 1.190 | 1.533 | 2.132 | 2.776  | 2.999  | 3.298  | 3.747  | 4.088  | 4.604  | 5.598   | 8.610   |
| 5        | 0.267    | 0.559 | 0.920 | 1.156 | 1.476 | 2.015 | 2.571  | 2.757  | 3.003  | 3.365  | 3.634  | 4.032  | 4.773   | 6.869   |
| 6        | 0.265    | 0.553 | 0.906 | 1.134 | 1.440 | 1.943 | 2.447  | 2.612  | 2.829  | 3.143  | 3.372  | 3.707  | 4.317   | 5.959   |
| 7        | 0.263    | 0.549 | 0.896 | 1.119 | 1.415 | 1.895 | 2.365  | 2.517  | 2.715  | 2.998  | 3.203  | 3.499  | 4.029   | 5.408   |
| 8        | 0.262    | 0.546 | 0.889 | 1.108 | 1.397 | 1.860 | 2.306  | 2.449  | 2.634  | 2.896  | 3.085  | 3.355  | 3.833   | 5.041   |
| 9        | 0.261    | 0.543 | 0.883 | 1.100 | 1.383 | 1.833 | 2.262  | 2.398  | 2.574  | 2.821  | 2.998  | 3.250  | 3.690   | 4.781   |
| 10       | 0.260    | 0.542 | 0.879 | 1.093 | 1.372 | 1.812 | 2.228  | 2.359  | 2.527  | 2.764  | 2.932  | 3.169  | 3.581   | 4.587   |
| 11       | 0.260    | 0.540 | 0.876 | 1.088 | 1.363 | 1.796 | 2.201  | 2.328  | 2.491  | 2.718  | 2.879  | 3.106  | 3.497   | 4.437   |
| 12       | 0.259    | 0.539 | 0.873 | 1.083 | 1.356 | 1.782 | 2.179  | 2.303  | 2.461  | 2.681  | 2.836  | 3.055  | 3.428   | 4.318   |
| 13       | 0.259    | 0.538 | 0.870 | 1.079 | 1.350 | 1.771 | 2.160  | 2.282  | 2.436  | 2.650  | 2.801  | 3.012  | 3.372   | 4.221   |
| 14       | 0.258    | 0.537 | 0.868 | 1.076 | 1.345 | 1.761 | 2.145  | 2.264  | 2.415  | 2.624  | 2.771  | 2.977  | 3.326   | 4.140   |
| 15       | 0.258    | 0.536 | 0.866 | 1.074 | 1.341 | 1.753 | 2.131  | 2.249  | 2.397  | 2.602  | 2.746  | 2.947  | 3.286   | 4.073   |
| 16       | 0.258    | 0.535 | 0.865 | 1.071 | 1.337 | 1.746 | 2.120  | 2.235  | 2.382  | 2.583  | 2.724  | 2.921  | 3.252   | 4.015   |
| 17       | 0.257    | 0.534 | 0.863 | 1.069 | 1.333 | 1.740 | 2.110  | 2.224  | 2.368  | 2.567  | 2.706  | 2.898  | 3.222   | 3.965   |
| 18       | 0.257    | 0.534 | 0.862 | 1.067 | 1.330 | 1.734 | 2.101  | 2.214  | 2.356  | 2.552  | 2.689  | 2.878  | 3.197   | 3.922   |
| 19       | 0.257    | 0.533 | 0.861 | 1.066 | 1.328 | 1.729 | 2.093  | 2.205  | 2.346  | 2.539  | 2.674  | 2.861  | 3.174   | 3.883   |
| 20       | 0.257    | 0.533 | 0.860 | 1.064 | 1.325 | 1.725 | 2.086  | 2.197  | 2.336  | 2.528  | 2.661  | 2.845  | 3.153   | 3.850   |
| 21       | 0.257    | 0.532 | 0.859 | 1.063 | 1.323 | 1.721 | 2.080  | 2.189  | 2.328  | 2.518  | 2.649  | 2.831  | 3.135   | 3.819   |
| 22       | 0.256    | 0.532 | 0.858 | 1.061 | 1.321 | 1.717 | 2.074  | 2.183  | 2.320  | 2.508  | 2.639  | 2.819  | 3.119   | 3.792   |
| 23       | 0.256    | 0.532 | 0.858 | 1.060 | 1.319 | 1.714 | 2.069  | 2.177  | 2.313  | 2.500  | 2.629  | 2.807  | 3.104   | 3.768   |
| 24       | 0.256    | 0.531 | 0.857 | 1.059 | 1.318 | 1.711 | 2.064  | 2.172  | 2.307  | 2.492  | 2.620  | 2.797  | 3.091   | 3.745   |
| 25       | 0.256    | 0.531 | 0.856 | 1.058 | 1.316 | 1.708 | 2.060  | 2.167  | 2.301  | 2.485  | 2.612  | 2.787  | 3.078   | 3.725   |
| 26       | 0.256    | 0.531 | 0.856 | 1.058 | 1.315 | 1.706 | 2.056  | 2.162  | 2.296  | 2.479  | 2.605  | 2.779  | 3.067   | 3.707   |
| 27       | 0.256    | 0.531 | 0.855 | 1.057 | 1.314 | 1.703 | 2.052  | 2.158  | 2.291  | 2.473  | 2.598  | 2.771  | 3.057   | 3.690   |
| 28       | 0.256    | 0.530 | 0.855 | 1.056 | 1.313 | 1.701 | 2.048  | 2.154  | 2.286  | 2.467  | 2.592  | 2.763  | 3.047   | 3.674   |
| 29       | 0.256    | 0.530 | 0.854 | 1.055 | 1.311 | 1.699 | 2.045  | 2.150  | 2.282  | 2.462  | 2.586  | 2.756  | 3.038   | 3.659   |
| 30       | 0.256    | 0.530 | 0.854 | 1.055 | 1.310 | 1.697 | 2.042  | 2.147  | 2.278  | 2.457  | 2.581  | 2.750  | 3.030   | 3.646   |
| 40       | 0.255    | 0.529 | 0.851 | 1.050 | 1.303 | 1.684 | 2.021  | 2.123  | 2.250  | 2.423  | 2.542  | 2.704  | 2.971   | 3.551   |
| 60       | 0.254    | 0.527 | 0.848 | 1.045 | 1.296 | 1.671 | 2.000  | 2.099  | 2.223  | 2.390  | 2.504  | 2.660  | 2.915   | 3.460   |
| 120      | 0.254    | 0.526 | 0.845 | 1.041 | 1.289 | 1.658 | 1.980  | 2.076  | 2.196  | 2.358  | 2.468  | 2.617  | 2.860   | 3.373   |
| $\infty$ | 0.253    | 0.524 | 0.842 | 1.036 | 1.282 | 1.645 | 1.960  | 2.054  | 2.170  | 2.326  | 2.432  | 2.576  | 2.807   | 3.291   |

|         |     |       |         |         |                   |
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| 考 試 科 目 | 統計學 | 系 所 別 | 企業管理研究所 | 考 試 時 間 | 2 月 5 日 (五) 第 4 節 |
|---------|-----|-------|---------|---------|-------------------|

Table of the Chi-square Distribution



| $\alpha =$ | 0.995     | 0.99     | 0.98     | 0.975   | 0.95     | 0.90     | 0.80     | 0.20    | 0.10    | 0.05    | 0.025   | 0.02    | 0.01    | 0.005   | 0.001   | $=\alpha$ |
|------------|-----------|----------|----------|---------|----------|----------|----------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|
| $\nu = 1$  | 0.0000993 | 0.000157 | 0.000228 | 0.00032 | 0.000493 | 0.000758 | 0.001358 | 0.00337 | 0.00541 | 0.00843 | 0.0135  | 0.0175  | 0.0263  | 0.0357  | 0.054   | $\nu = 1$ |
| 2          | 0.0100    | 0.0201   | 0.0404   | 0.0506  | 0.103    | 0.211    | 0.446    | 3.219   | 4.605   | 5.991   | 7.378   | 7.824   | 9.210   | 10.597  | 13.815  | 2         |
| 3          | 0.0717    | 0.115    | 0.185    | 0.216   | 0.352    | 0.584    | 1.005    | 4.642   | 6.251   | 7.815   | 9.348   | 9.837   | 11.345  | 12.838  | 16.268  | 3         |
| 4          | 0.207     | 0.297    | 0.429    | 0.484   | 0.711    | 1.064    | 1.649    | 5.989   | 7.779   | 9.488   | 11.143  | 11.668  | 13.277  | 14.860  | 18.465  | 4         |
| 5          | 0.412     | 0.554    | 0.752    | 0.831   | 1.145    | 1.610    | 2.343    | 7.289   | 9.236   | 11.070  | 12.832  | 13.388  | 15.086  | 16.750  | 20.517  | 5         |
| 6          | 0.676     | 0.872    | 1.134    | 1.237   | 1.635    | 2.204    | 3.070    | 8.558   | 10.645  | 12.592  | 14.440  | 15.033  | 16.812  | 18.548  | 22.457  | 6         |
| 7          | 0.989     | 1.239    | 1.564    | 1.690   | 2.167    | 2.833    | 3.822    | 9.803   | 12.017  | 14.067  | 16.013  | 16.622  | 18.475  | 20.278  | 24.332  | 7         |
| 8          | 1.344     | 1.646    | 2.032    | 2.180   | 2.733    | 3.490    | 4.594    | 11.030  | 13.362  | 15.507  | 17.535  | 18.168  | 20.090  | 21.955  | 26.125  | 8         |
| 9          | 1.735     | 2.088    | 2.532    | 2.700   | 3.325    | 4.168    | 5.380    | 12.242  | 14.684  | 16.919  | 19.023  | 19.679  | 21.666  | 23.589  | 27.877  | 9         |
| 10         | 2.156     | 2.558    | 3.059    | 3.247   | 3.940    | 4.865    | 6.179    | 13.442  | 15.987  | 18.307  | 20.483  | 21.161  | 23.209  | 25.188  | 29.588  | 10        |
| 11         | 2.603     | 3.053    | 3.609    | 3.816   | 4.575    | 5.578    | 6.989    | 14.631  | 17.275  | 19.675  | 21.920  | 22.618  | 24.725  | 26.757  | 31.264  | 11        |
| 12         | 3.074     | 3.571    | 4.178    | 4.404   | 5.226    | 6.304    | 7.807    | 15.812  | 18.549  | 21.026  | 23.337  | 24.054  | 26.217  | 28.300  | 32.909  | 12        |
| 13         | 3.565     | 4.107    | 4.765    | 5.009   | 5.892    | 7.042    | 8.634    | 16.985  | 19.812  | 22.362  | 24.736  | 25.472  | 27.688  | 29.819  | 34.528  | 13        |
| 14         | 4.075     | 4.660    | 5.368    | 5.629   | 6.571    | 7.790    | 9.467    | 18.151  | 21.064  | 23.685  | 26.119  | 26.873  | 29.141  | 31.319  | 36.123  | 14        |
| 15         | 4.601     | 5.229    | 5.985    | 6.262   | 7.261    | 8.547    | 10.307   | 19.311  | 22.307  | 24.996  | 27.488  | 28.259  | 30.578  | 32.801  | 37.697  | 15        |
| 16         | 5.142     | 5.812    | 6.614    | 6.908   | 7.962    | 9.312    | 11.152   | 20.465  | 23.542  | 26.296  | 28.845  | 29.633  | 32.000  | 34.267  | 39.252  | 16        |
| 17         | 5.697     | 6.408    | 7.255    | 7.564   | 8.672    | 10.085   | 12.002   | 21.615  | 24.769  | 27.587  | 30.191  | 30.995  | 33.409  | 35.718  | 40.790  | 17        |
| 18         | 6.265     | 7.015    | 7.906    | 8.231   | 9.390    | 10.865   | 12.857   | 22.760  | 25.989  | 28.869  | 31.526  | 32.346  | 34.805  | 37.156  | 42.312  | 18        |
| 19         | 6.844     | 7.633    | 8.567    | 8.907   | 10.117   | 11.651   | 13.716   | 23.900  | 27.204  | 30.144  | 32.852  | 33.687  | 36.191  | 38.582  | 43.820  | 19        |
| 20         | 7.434     | 8.260    | 9.237    | 9.591   | 10.851   | 12.443   | 14.578   | 25.038  | 28.412  | 31.410  | 34.170  | 35.020  | 37.566  | 39.997  | 45.315  | 20        |
| 21         | 8.034     | 8.897    | 9.915    | 10.283  | 11.591   | 13.240   | 15.445   | 26.171  | 29.615  | 32.671  | 35.479  | 36.343  | 38.932  | 41.401  | 46.797  | 21        |
| 22         | 8.643     | 9.542    | 10.600   | 10.982  | 12.338   | 14.041   | 16.314   | 27.301  | 30.813  | 33.924  | 36.781  | 37.650  | 40.289  | 42.796  | 48.268  | 22        |
| 23         | 9.260     | 10.196   | 11.293   | 11.688  | 13.091   | 14.848   | 17.187   | 28.429  | 32.007  | 35.172  | 38.076  | 38.968  | 41.638  | 44.181  | 49.728  | 23        |
| 24         | 9.886     | 10.856   | 11.992   | 12.401  | 13.848   | 15.659   | 18.062   | 29.553  | 33.196  | 36.415  | 39.364  | 40.270  | 42.980  | 45.558  | 51.179  | 24        |
| 25         | 10.520    | 11.524   | 12.697   | 13.120  | 14.611   | 16.473   | 18.940   | 30.675  | 34.382  | 37.652  | 40.646  | 41.566  | 44.314  | 46.928  | 52.620  | 25        |
| 26         | 11.160    | 12.198   | 13.409   | 13.844  | 15.379   | 17.292   | 19.820   | 31.795  | 35.563  | 38.885  | 41.923  | 42.856  | 45.642  | 48.290  | 54.052  | 26        |
| 27         | 11.808    | 12.879   | 14.125   | 14.573  | 16.151   | 18.114   | 20.703   | 32.912  | 36.741  | 40.113  | 43.194  | 44.140  | 46.963  | 49.645  | 55.476  | 27        |
| 28         | 12.461    | 13.565   | 14.847   | 15.308  | 16.928   | 18.939   | 21.588   | 34.027  | 37.916  | 41.337  | 44.461  | 45.419  | 48.273  | 50.993  | 56.893  | 28        |
| 29         | 13.121    | 14.256   | 15.574   | 16.047  | 17.708   | 19.768   | 22.475   | 35.139  | 39.087  | 42.557  | 45.722  | 46.693  | 49.588  | 52.336  | 58.302  | 29        |
| 30         | 13.787    | 14.953   | 16.306   | 16.791  | 18.493   | 20.599   | 23.364   | 36.250  | 40.256  | 43.773  | 46.979  | 47.962  | 50.892  | 53.672  | 59.703  | 30        |
| 40         | 20.706    | 22.164   | 23.838   | 24.433  | 26.509   | 29.051   | 32.345   | 47.269  | 51.805  | 55.759  | 59.342  | 60.456  | 63.691  | 66.766  | 73.402  | 40        |
| 50         | 27.991    | 29.707   | 31.664   | 32.357  | 34.764   | 37.689   | 41.449   | 58.164  | 63.167  | 67.505  | 71.420  | 72.613  | 76.154  | 79.490  | 86.661  | 50        |
| 60         | 35.535    | 37.485   | 39.699   | 40.482  | 43.188   | 46.459   | 50.641   | 68.972  | 74.397  | 79.082  | 83.298  | 84.580  | 88.379  | 91.952  | 99.607  | 60        |
| 70         | 43.275    | 45.442   | 47.893   | 48.758  | 51.739   | 55.329   | 59.898   | 79.715  | 85.527  | 90.531  | 95.023  | 96.368  | 100.425 | 104.215 | 112.317 | 70        |
| 80         | 51.171    | 53.539   | 56.213   | 57.153  | 60.391   | 64.278   | 69.207   | 90.405  | 96.578  | 101.880 | 106.629 | 108.069 | 112.329 | 116.321 | 124.839 | 80        |
| 90         | 59.196    | 61.754   | 64.634   | 65.646  | 69.126   | 73.291   | 78.558   | 101.054 | 107.565 | 113.145 | 118.136 | 119.648 | 124.116 | 128.299 | 137.208 | 90        |
| 100        | 67.327    | 70.065   | 73.142   | 74.222  | 77.929   | 82.358   | 87.945   | 111.667 | 118.498 | 124.342 | 129.561 | 131.142 | 135.807 | 140.170 | 149.449 | 100       |

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  | 管理學                                   | 系所別 | 企業管理研究所<br>(MBA 學位學程) | 考試時間 | 2 月 5 日(五) 第 4 節 |
| <p>1. (25%) 在考量組織外部環境與檢視內部可用的資源能力之後，管理者會制定幫助組織達成目標的總體公司層級策略、事業競爭策略以及功能策略。</p> <p>a. (10%) 請分別說明何謂總體公司層級策略(Corporate strategies)、事業競爭策略(Competitive strategies/Business strategies)。</p> <p>b. (15%) 台積電是一家晶圓代工半導體製造廠。若台積電計畫制定成長策略(Growth strategy)來擴大其市場規模，請列點說明該公司可以透過那些方式幫助公司成長。</p> <p>2. (25%) 優秀的領導者是能在任何情況下領導任何組織或任務，或是具備適當特質與能力的人在適當情境下執行特定任務？請說明你的觀點，並試舉出二個相關的領導理論支持你的觀點。</p> <p>3. 平衡計分卡(balanced scorecard)為績效管理的一項重要工具 (Kaplan &amp; Norton, 1992)，可以協助管理者將公司的策略目標轉換成一連串績效衡量指標。請回答以下兩個問題：(1) 請以平衡計分卡四大構面介紹平衡計分卡 (16%) (2)請以蘋果公司 (Apple Inc.) 為例，說明平衡計分卡在此公司的應用 (9%)。</p> <p>4. 在組織中，領導者的權利來源和類型有五大類。請回答以下兩個問題：(1) 請列出和說明此五種權力 (15%) (2)請以鴻海郭台銘董事長為例，說明郭董事長如何運用此五種權力，在鴻海達成有效領導 (10%)。</p> |                                       |     |                       |      |                  |
| 備註  | <p>一、作答於試題上者，不予計分。<br/>二、試題請隨卷繳交。</p> |     |                       |      |                  |

|      |     |     |                   |      |                |
|------|-----|-----|-------------------|------|----------------|
| 考試科目 | 微積分 | 系所別 | 企管所 (MBA 學位學程) 乙組 | 考試時間 | 2 月 5 日(五) 第四節 |
|------|-----|-----|-------------------|------|----------------|

1. (20 points) Evaluate the integral  $\int_0^{\infty} x^{-1} e^{-x} dx$ .

2. (20 points) Let

$$f(x) = \prod_{i=1}^{10} x_i^{i-0.5} = x_1^{0.5} x_2^{1.5} \dots x_{10}^{9.5},$$

where  $0 < x_i < 1$  and  $\sum_{i=1}^k x_i = 1$ . Find  $x^* = (x_1^*, \dots, x_{10}^*)$  that maximizes  $f(x)$ .

3. (20 points) Find the value of  $x$  such that

$$\int_0^x 2te^{-t^2} dt = \int_x^{\infty} 2te^{-t^2} dt.$$

4. (40 points) W Bookstore purchases textbooks at wholesale price is \$225 per item, and the selling price is \$350 per item. Any unsold books are salvaged at \$100. Let  $q$  denote the order quantity and  $d$  denote the demand.

(a) (15 points) Write down the profit as

$$C_1 \min\{q, d\} + C_2 \max\{0, q - d\} + C_3 q.$$

Determine  $C_1$ ,  $C_2$  and  $C_3$ .

(b) (25 points) Assume that the demand has a normal distribution with mean 12,000 and standard deviation 200; the probability density function for a normal distribution with mean  $\mu$  and variance  $\sigma^2$  is

$$f(x) = \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{(x-\mu)^2}{2\sigma^2}}.$$

Write down the expected profit and find the optimal order quantity that maximizes the expected profit.

備

註

- 一、作答於試題上者，不予計分。  
二、試題請隨卷繳交。