考試科目	經濟學	系所別	商學院共同科	考試時間	2 月 6 日（五）第 二 節

I. Multiple Choice (1 points each)

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

1. Suppose the introduction of new tariffs on imported ovens not only raises the prices of imported ovens but also those of domestic ovens. We can conclude that imported and domestic ovens are
   A. substitutes.
   B. complements.
   C. unrelated.
   D. None of the above is correct.

2. According to consumer theory, "if consumers do not buy less of a commodity when their incomes rise, they will
   A. surely buy less when the price of the commodity rises."
   B. surely buy more when the price of the commodity rises."
   C. surely buy less when the price of the commodity falls."
   D. either buy more or less when the price of the commodity rises."

3. People with hidden health problems are more likely to buy health insurance than are other people. This is an example of
   A. moral hazard and makes the cost of health insurance higher than otherwise.
   B. moral hazard and makes the cost of health insurance lower than otherwise.
   C. adverse selection and makes the cost of health insurance higher than otherwise.
   D. adverse selection and makes the cost of health insurance lower than otherwise.

4. Ben has a concave utility function $U(W) = W^{0.5}$, where W denotes his wealth. His only asset is shares in a start-up company. Tomorrow he will learn the stock's value. He believes that it is worth \$144 with probability $\frac{1}{2}$ and \$100 with probability $\frac{1}{2}$. What is the risk premium he would pay to avoid bearing this risk?
   A. 1
   B. 2
   C. 10
   D. 12

5. Which of the following demonstrates the law of demand?
   A. Ashlyn buys more apples at \$3 per pound than at \$5 per pound, other things equal.
   B. Brian buys fewer croissants at \$1 per croissant than at \$2 per croissant, other things equal.
   C. After Charles got a raise at work, he bought more pretzels at \$2 per pretzel than he did before his raise.

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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D. Danny buys fewer Snickers at \$1.5 per bar after the price of Skittles falls to \$1 per bag.

6. In the long run, the toothpaste market is monopolistically competitive, and WhiteMan is one of the firms. WhiteMan's long-run cost function is $c(q) = q^3 - xq^2 + 14q$. The firm faces demand $q = 5 - \frac{1}{2}p$. What is x?

A. 3
B. 4
C. 5
D. 6

7. There are four residents i =1, 2, 3, and 4 in a small village. If resident i donates d_i dollars, total public funding is $D = \sum_{i=1}^{4} d_i$. Resident i's utility is $U_i = m_i - d_i + i \cdot \ln(D)$, where m_i is the money resident i has and $m_i > 6$ for all i. What is the socially optimal level of D?

A. 8
B. 10
C. 12
D. 14

8. Demand for bubble tea is $q_d = 42 - 2p$, and supply is $q_s = 0.5p - 2$. Consumption causes an obesity external cost $c_s = 3q^2$. Which policy achieves the social optimum?

A. Close the bubble tea market.
B. For every bubble tea consumed, the customer pays the bubble store 12 dollars more.
C. For every bubble tea produced, the bubble store pays 12 dollars to the government.
D. Set a quota equal to $q = 3$.

9. Consider the game in the payoff matrix.

		Player 2	
		B	T
Player 1	B	(2, 1)	(0, 0)
	T	(0, 0)	(1, 2)

Which the following description is wrong?

A. There are 3 Nash equilibria.
B. In the mixed-strategy Nash equilibrium, all players get less than 1.
C. If player 1 moves first, (2, 1) can be the Nash equilibrium payoff.
D. If player 2 moves first, (2, 1) cannot be a Nash equilibrium payoff.

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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10. Regarding the "tragedy of the commons," which statement is incorrect?
A. Rivalry in the use of the resource is the main cause of the problem.
B. It is an example of the prisoner's dilemma.
C. Limiting access to the common resource can alleviate the problem.
D. The government may use a cap-and-trade policy to address the problem.

11. In the base year, consumers buy mostly beef. In the current year, beef prices rise sharply, so consumers switch to chicken (which did not rise in price). Assume the CPI is calculated using a fixed basket, while GDP deflator uses current quantities. Which statement is MOST likely true?
A. CPI and GDP deflator both overstate inflation equally.
B. CPI overstates inflation more than GDP deflator.
C. GDP deflator overstates inflation more than CPI.
D. Both CPI and GDP deflator correctly measure inflation.

12. A country imports most of its consumer electronics. Due to a global chip shortage, import prices of electronics rise by 30%, while domestically produced goods barely change in price. No major change occurs in quantities produced. What happens?
A. CPI rises significantly; GDP deflator rises little.
B. GDP deflator rises significantly; CPI rises little.
C. Both rise significantly.
D. Neither rises significantly.

13. In the simple Keynesian cross model with exogenous investment, the government requires households to deposit part of their income into restricted mutual-fund accounts for their children, and these funds are not used to finance any current domestic physical investment (they are held purely as financial assets for future use). What happens to current output?
A. Current output rises because higher saving leads to higher investment.
B. Current output falls because consumption decreases and investment is exogenous.
C. Current output does not change because only government spending matters.
D. Current output rises because mutual-fund purchases count as investment in GDP.

14. U.S. inflation this year is 5%, and Taiwan's inflation is 2%. Assume relative PPP holds, so the real exchange rate remains constant. What should happen to the nominal exchange rate? Let the exchange rate be quoted as NT dollars per U.S. dollar (NTD/USD).
A. NTD/USD should rise by about 3%.
B. NTD/USD should fall by about 3%.
C. NTD/USD should not change.
D. The direction cannot be determined.

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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15. Consider a small open economy with free capital mobility and a floating exchange rate. If the government increases its budget deficit (holding everything else constant), what is the most likely effect on the interest rate, net capital flows, and the real exchange rate?

A. Domestic interest rate rises; capital inflow increases; domestic currency appreciates.

B. Domestic interest rate rises; capital outflow increases; domestic currency depreciates.

C. Domestic interest rate remains unchanged; capital inflow increases; domestic currency appreciates.

D. Domestic interest rate remains unchanged; capital outflow increases; domestic currency depreciates.

16. Which of the following definitions is correct?

A. Labor force = number of employed.

B. Labor force = population − number of unemployed.

C. Unemployment Rate = (number of unemployed ÷ adult population) × 100.

D. Unemployment Rate = (number of unemployed ÷ [number of employed + number of unemployed]) × 100.

17. People will want to hold more money if the price level

A. or the interest rate increases.

B. or the interest rate decreases.

C. increases or the interest rate decreases.

D. decreases or the interest rate increases.

18. The Fisher equation states the long-run relationship between nominal interest rate, real interest rate, and the inflation rate. Suppose that the Fisher equation holds and that monetary policy is neutral in the sense that it has no impact on the real interest rate in the long run. Then given that the real interest rate is fixed over time, if the central bank increases the nominal interest rate target, how will the inflation rate respond in the long run?

A. Increase

B. Decrease

C. Unchanged

D. Uncertain

19. An increase in expected inflation shifts

A. the long-run Phillips curve right.

B. the short-run Phillips curve right.

C. neither the short-run nor long-run Phillips curve right.

D. both the short-run and long-run Phillips curve right.

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	經濟學	系所別	商學院共同科	考試時間	2 月 6 日（五）第 二 節

20. If the Fed conducts open-market operations and sells short-term government bonds, the money supply

A. increases and aggregate demand shifts right.

B. increases and aggregate demand shifts left.

C. decreases and aggregate demand shifts right.

D. decreases and aggregate demand shifts left.

II. Problems and Short-essay Questions

1. Suppose that the inverse demand function is $p = 10 - Q$ and the inverse supply function is $p = 1 + 2Q$.

a. (8 points) Calculate the incidence of a specific tax of \$1 per unit falling on consumers.

b. (8 points) What are the corresponding price elasticities of demand and supply in the pre-tax equilibrium?

c. (4 points) Now suppose that the inverse demand function is given by $p = 10 - bQ$ and the inverse supply function is $p = 1 + dQ$. Calculate the incidence of a specific tax of \$1 per unit falling on consumers as a function of b and d.

2. A monopolist firm has two identical factories, 1 and 2. Each factory has cost q_i^2, where q_i stands for factory i's output, $i = 1, 2$. If a factory produces any positive output, the firm must pay a fixed tax of \$2 for that factory. Let total output be $Q = q_1 + q_2$.

a. (10 points) What is the cost function of the firm?

b. (10 points) Suppose the firm can identify two isolated markets, A and B, with demand functions

$$P_A = 5 - Q_A,$$
$$P_B = 5 - \frac{1}{2}Q_B.$$

Please calculate the equilibrium price and quantity in each market.

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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3. Consider an open economy described by the following equations:

$$Y = C + I + G + NX$$
$$C = 180 + 0.65(Y - T)$$
$$I = 350 - 40r$$
$$G = 200$$
$$T = 150$$
$$NX = 120 - 0.1Y + 15q$$

where Y is GDP, C is consumption, I is investment, G is government purchases, T is taxes, r is the interest rate, NX is next exports, and q is the real exchange rate (an increase in q means a depreciation). Suppose the full-employment level of GDP is $Y^* = 2000$.

a. (10 points) Suppose the central bank keeps the interest rate fixed at $r = 4$ and the real exchange rate is $q = 1$. Solve for equilibrium GDP. Is the economy above or below full employment? Please show your calculation.

b. (5 points) Assuming no change in monetary or exchange-rate policy, by how much would GDP have to change to restore full employment? Please show your calculation.

c. (5 points) Instead, suppose fiscal policy does not change. What change in the real exchange rate q would be required to restore full employment (interpret your result as appreciation or depreciation)? Please show your calculation.

4. Suppose that an economy has the Phillips curve

$$\pi_t = \pi_{t-1} - 0.5(u_t - 0.04)$$

where π_t is the inflation rate at time t and u_t is the unemployment rate at time t.

a. (3 points) What is the natural rate of unemployment? Briefly explain your answer.

b. (7 points) Graph the short-run and long-run relationships between inflation and unemployment implied by this Phillips curve. Clearly label: (i) the horizontal axis, (ii) the vertical axis, and (iii) the point at which the short-run Phillips curve intersects the long-run Phillips curve.

c. (5 points) Compute the sacrifice ratio in this economy. Clearly explain your calculations.

d. (5 points) Suppose the current inflation rate is 10 percent. The central bank aims to reduce inflation to 5 percent. How much cyclical unemployment is necessary to achieve this reduction in inflation? Clearly explain your calculations.

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	企管所 (MBA 學位學程甲組)	考試時間	2月6日(五) 第4節

請將題號與答案標示清楚, 表格請見 Pages 5-7

第一大題(無須寫過程, 每題 3 分) (30%)

1. A man with 10 keys wants to open his door and tries the keys at random. Suppose there is exactly one key will open the door. If unsuccessful keys are eliminated from further selections. Let X be the number of trials to find the right key. Which model can describe X?
(a) Uniform[1,2,..,10] (b) Hypergeometric(10,1,1) (c) Bin(10, 10%) (d) Geo(1/10)

2. A 95% confidence interval estimate of the population mean μ can be interpreted to mean:
(a) If all possible sample are taken and confidence intervals created, 95% of them would include the true population mean somewhere within their interval.
(b) We estimate that the population mean falls between the lower and upper confidence limits, and this type of estimator is correct 95% of the time.
(c) In repeated sampling, the population parameter would fall in the resulting interval 95% of the time.
(d) All of these choices are true.

3. Suppose that two population variances are the same but unknown. In order to determine whether or not the means of two populations are equal,
(a) A t-test must be performed
(b) An analysis of variance must be performed
(c) Either a t-test or an analysis of variance can be performed
(d) A chi-square test must be performed

4. Which of the following tests is appropriate for data if the problem objective is to compare two population proportions and there are exactly 2 categories?
(a) The z-test. (b) The chi-squared test. (c) Both (a) and (b). (d) None of these choices.

5. The width of the confidence interval estimate for the predicted value of y depends on
(a) The standard error of the estimate
(b) The value of x for which the prediction is being made
(c) The sample size
(d) All of these choices are true.

6. In testing the hypothesis H_0: $\mu = 100$ vs. H_A: $\mu > 100$, the p-value is found to be 0.074, and the sample mean is 105. Which of the following statements is true?
(a) The probability of observing a sample mean at least as large as 105 from a population whose mean is 100 is 0.074.
(b) The probability of observing a sample mean smaller than 105 from a population whose mean is 100 is 0.074
(c) The probability that the population mean is larger than 100 is 0.074.

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(d) None of these choices.

7. Suppose the ages of students in your program follow a skewed distribution with mean of 24 years and a standard deviation of 4 years. If we randomly sampled 100 students, which of the following statements about the sampling distribution of the sample mean age is NOT true?

(a) The mean of the sampling distribution of sample mean is equal to 24 years.

(b) The standard deviation of the sampling distribution of sample mean is equal to 4 years.

(c) The shape of the sampling distribution of sample mean is approximately normal.

(d) All of these choices are true.

8. A sample of 51 observations will be taken from an infinite population. The population proportion equals 0.85. The probability that the sample proportion will be between 0.9115 and 0.946 is

(a) 0.8633

(b) 0.6900

(c) 0.0819

(d) 0.0345

9. Bowl **A** contains 100 red balls and 200 white balls; bowl **B** contains 200 red balls and 100 white balls. Let p denote the probability of drawing a red ball from a bowl, but say p is unknown, since it is unknown whether bowl **A** or bowl **B** is being used. We shall test the null hypothesis $H_0: p = 1/3$ against $H_A: p = 2/3$. So we draw three balls at random, one at a time and with replacement, from the selected bowl. Let X equal the number of red balls draw. Which of the following rejection region is correct?

(a) Reject H_0 if $X > 2$

(b) Reject H_0 if $X < 2$

(c) Reject H_0 if $X = 2$

(d) Reject H_0 if $X = 1$

10. If the level of significance of a hypothesis test is raised from .01 to .05, the probability of a Type II error

(a) will also increase from .01 to .05

(b) will not change

(c) will decrease

(d) will increase

第二大題(簡答題,請直接寫出答案即可,每題4分(70%)

11. Five observations are randomly selected from a discrete uniform distribution with probability function $f(x) = \frac{1}{2\theta+1}, x = -\theta, (-\theta+1), \ldots, 0, \ldots, (\theta-1), \theta$. Find a suitable value of θ given the five observations are $3, -1, -5, 2$ and 1.

12. The following contingency table shows the results of a random sample of adults classified by their gender and color preference. Suppose the sample consists 100 adults and the sample proportions are displayed in cells. If we

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want to determine whether there is no difference in the color preferences of men and women. Find the test statistic

	Red	Yellow	Blue
Men	0.13	0.19	0.28
Women	0.07	0.11	0.22

13. Two laboratories independently test the same null hypothesis H_0: $\mu = 100$ against H_A: $\mu > 100$. Lab A uses $\alpha = 0.05$, power = 0.70 when $\mu = 105$. Lab B uses $\alpha = 0.01$, power = 0.50 when $\mu = 105$.

(a) Which lab's test is more conservative? (2pts)

(b) Which lab is more likely to miss a true effect when $\mu = 105$? (2pts)

14. The summary statistics of hourly income earned by a sample of 100 waiters at NYC are shown below. Which of the following statements are correct?

(a) 75 is an outlier (b) 145 is an outlier (c) The difference of maximum and minimum values is a statistic (d) The distribution is skewed to the right

Min	Q1	Q2	Q3	Max
75	114	134	141	145

15. State the central limit theorem including its assumption(s)

第三大題(15%)

A study compares three fertilizing methods (A, B, C) on crop yield (in kg). Each fertilizing group consists of five observations, and the summary statistics are given below.

Method	Average	Variance
A	78	47.5
B	84	50.0
C	89	54.5

The following regression model is applied to analyze the data:

$$Y = \beta_0 + \beta_1 Z_1 + \beta_2 Z_2 + \varepsilon ,$$

where Z_1 and Z_2 are dummy variables indicating methods A and B, and method C serves as the reference group:

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$$Z_1 = \begin{cases} 1, & \text{if method A} \\ 0, & \text{otherwise} \end{cases}, \qquad Z_2 = \begin{cases} 1, & \text{if method B} \\ 0, & \text{otherwise} \end{cases},$$

(a)(7%) Find the estimated regression coefficients $\hat{\beta}_0$, $\hat{\beta}_1$ and $\hat{\beta}_2$.

(b)(8%) Find the test statistic for H_0: $\beta_1 = \beta_2 = 0$. Use $\alpha = 0.05$

第四大題(15%)

A box contains 8 white and 2 black balls. A ball is chosen randomly. Suppose you will win $2 when a black ball is selected, and win -$1(or lose $1) when a white ball is selected. Let X denote your winnings.

(a)(2pt) Find the probability function for X

(b)(2pt) Find the expected value of X

(c)(3pt) Find the variance of X

(d)(8pt) Suppose you repeatedly play this game 50 times. Find the probability that you will lose $25

第五大題(20%)

Students taking a standardized IQ test had a mean score of 100 with a standard deviation of 15. Assume that the scores are normally distributed

(a) (7pt) If 2000 students are randomly selected, how many would be expected to have an IQ score that is less than 90?

(b) (7pt) Are you likely to randomly select one student with an IQ score greater than 105 or are you more likely to randomly select a sample of 15 students with a mean IQ score greater than 105? Explain your answer

(c) (6pt) Suppose that 100 students are randomly selected and the sample mean is reported as 102. According to this result, conduct a hypothesis testing to determine whether the mean score of IQ increases or not. Please report p-value and use $\alpha = 0.05$

附錄：表格

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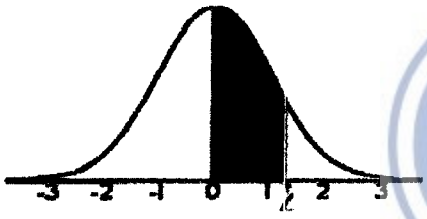
Table I: Chi-square table

Upper tail		0.3	0.2	0.1	0.05	0.02	0.01	0.005	0.001
df	2	2.41	3.22	4.61	5.99	7.82	9.21	10.60	13.82
	3	3.66	4.64	6.25	7.81	9.84	11.34	12.84	16.27
	4	4.88	5.99	7.78	9.49	11.67	13.28	14.86	18.47
	5	6.06	7.29	9.24	11.07	13.30	15.09	16.75	20.52
	6	7.23	8.56	10.64	12.59	15.03	16.81	18.55	22.46
	7	8.38	9.80	12.02	14.07	16.62	18.48	20.28	24.32
	8	9.52	11.03	13.36	15.51	18.17	20.09	21.95	26.12
	9	10.66	12.24	14.68	16.92	19.68	21.67	23.59	27.88
	10	11.78	13.44	15.99	18.31	21.16	23.21	25.19	29.59
	11	12.90	14.63	17.28	19.68	22.62	24.72	26.76	31.26
	12	14.01	15.81	18.55	21.03	24.05	26.22	28.30	32.91
	13	15.12	16.98	19.81	22.36	25.47	27.69	29.82	34.53
	14	16.22	18.15	21.06	23.68	26.87	29.14	31.32	36.12
	15	17.32	19.31	22.31	25.00	28.26	30.58	32.80	37.70



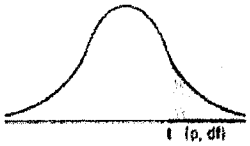
STANDARD NORMAL TABLE (Z)

Entries in the table give the area under the curve between the mean and *z* standard deviations above the mean. For example, for *z* = 1.25 the area under the curve between the mean (0) and *z* is 0.3944.

	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2969	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3513	0.3554	0.3577	0.3529	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916

考試科目	統計學	系所別	企管所 (MBA 學位學程甲組)	考試時間	2月6日(五)第4節

t table



df/p	0.40	0.25	0.10	0.05	0.025	0.01	0.005	0.0005
1	0.324920	1.000000	3.077684	6.313752	12.70620	31.82052	63.65674	636.6192
2	0.288675	0.816497	1.885618	2.919986	4.30265	6.96456	9.92484	31.5991
3	0.276671	0.764892	1.637744	2.353363	3.18245	4.54070	5.84091	12.9240
4	0.270722	0.740697	1.533206	2.131847	2.77645	3.74695	4.60409	8.6103
5	0.267181	0.726687	1.475884	2.015048	2.57058	3.36493	4.03214	6.8688
6	0.264835	0.717558	1.439756	1.943180	2.44691	3.14267	3.70743	5.9588
7	0.263167	0.711142	1.414924	1.894579	2.36462	2.99795	3.49948	5.4079
8	0.261921	0.706387	1.396815	1.859548	2.30600	2.89646	3.35539	5.0413
9	0.260955	0.702722	1.383029	1.833113	2.26216	2.82144	3.24984	4.7809
10	0.260185	0.699812	1.372184	1.812461	2.22814	2.76377	3.16927	4.5869
11	0.259556	0.697445	1.363430	1.795885	2.20099	2.71808	3.10581	4.4370
12	0.259033	0.695483	1.356217	1.782288	2.17881	2.68100	3.05454	4.3178
13	0.258591	0.693829	1.350171	1.770933	2.16037	2.65031	3.01228	4.2208
14	0.258213	0.692417	1.345030	1.761310	2.14479	2.62449	2.97684	4.1405
15	0.257885	0.691197	1.340606	1.753050	2.13145	2.60248	2.94671	4.0728

考試科目	統計學	系所別	企管所 (MBA 學位學程甲組)	考試時間	2月6日(五) 第4節

Table III: F table with $\alpha = 0.05$

Denominator DF	Numerator DF									
	1	2	3	4	5	6	7	8	9	10
1	161.448	199.500	215.707	224.583	230.162	233.986	236.768	238.883	240.543	241.882
2	18.513	19.000	19.164	19.247	19.296	19.330	19.353	19.371	19.385	19.396
3	10.128	9.552	9.277	9.117	9.013	8.941	8.887	8.845	8.812	8.786
4	7.709	6.944	6.591	6.388	6.256	6.163	6.094	6.041	5.999	5.964
5	6.608	5.786	5.409	5.192	5.050	4.950	4.876	4.818	4.772	4.735
6	5.987	5.143	4.757	4.534	4.387	4.284	4.207	4.147	4.099	4.060
7	5.591	4.737	4.347	4.120	3.972	3.866	3.787	3.726	3.677	3.637
8	5.318	4.459	4.066	3.838	3.687	3.581	3.500	3.438	3.388	3.347
9	5.117	4.256	3.863	3.633	3.482	3.374	3.293	3.230	3.179	3.137
10	4.965	4.103	3.708	3.478	3.326	3.217	3.135	3.072	3.020	2.978
11	4.844	3.982	3.587	3.357	3.204	3.095	3.012	2.948	2.896	2.854
12	4.747	3.885	3.490	3.259	3.106	2.996	2.913	2.849	2.796	2.753
13	4.667	3.806	3.411	3.179	3.025	2.915	2.832	2.767	2.714	2.671
14	4.600	3.739	3.344	3.112	2.958	2.848	2.764	2.699	2.646	2.602
15	4.543	3.682	3.287	3.056	2.901	2.790	2.707	2.641	2.588	2.544
16	4.494	3.634	3.239	3.007	2.852	2.741	2.657	2.591	2.538	2.494
17	4.451	3.592	3.197	2.965	2.810	2.699	2.614	2.548	2.494	2.450
18	4.414	3.555	3.160	2.928	2.773	2.661	2.577	2.510	2.456	2.412
19	4.381	3.522	3.127	2.895	2.740	2.628	2.544	2.477	2.423	2.378
20	4.351	3.493	3.098	2.866	2.711	2.599	2.514	2.447	2.393	2.348
21	4.325	3.467	3.072	2.840	2.685	2.573	2.488	2.420	2.366	2.321
22	4.301	3.443	3.049	2.817	2.661	2.549	2.464	2.397	2.342	2.297
23	4.279	3.422	3.028	2.796	2.640	2.528	2.442	2.375	2.320	2.275
24	4.260	3.403	3.009	2.776	2.621	2.508	2.423	2.355	2.300	2.255
25	4.242	3.385	2.991	2.759	2.603	2.490	2.405	2.337	2.282	2.236
26	4.225	3.369	2.975	2.743	2.587	2.474	2.388	2.321	2.265	2.220
27	4.210	3.354	2.960	2.728	2.572	2.459	2.373	2.305	2.250	2.204
28	4.196	3.340	2.947	2.714	2.558	2.445	2.359	2.291	2.236	2.190
29	4.183	3.328	2.934	2.701	2.545	2.432	2.346	2.278	2.223	2.177
30	4.171	3.316	2.922	2.690	2.534	2.421	2.334	2.266	2.211	2.165

備註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

國立政治大學 115 學年度 碩士班暨碩士在職專班 招生考試試題

考試科目	管理學	系所別	企業管理研究所 (MBA 學位學程)	考試時間	2 月 6 日(五) 第 4 節

以下共 4 大題（每題 25 分），作答時請清楚標明題號，以利閱卷。

1. 對管理者而言，決策不僅是一項技術活動，更是一種承擔風險與責任的管理行為。在時間與資訊有限的情況下，如何做出相對合理的判斷，成為管理能力的重要展現。請回答下列問題：

(1-1) 即使在決策條件受限、無法進行完整分析的情境下，管理者仍須即時做出判斷。請說明管理者在決策過程中，應如何結合理性分析與直覺判斷。(10%)

(1-2) 請說明在上述決策過程中，可能產生哪些決策偏差或錯誤？管理者可如何透過決策流程或制度設計，降低其影響？(15%)

2. 近年來，快時尚(Fast Fashion)品牌以快速回應潮流、低價格與高產品更新頻率，成功吸引大量消費者，並在全球市場快速擴張。然而，此一商業模式也因大量資源消耗、碳排放、廢棄衣物以及供應鏈中涉及工時、薪資與勞動安全等勞動條件問題，受到環保團體與投資人日益嚴格的檢視。為回應外界壓力，某大型快時尚企業近年來陸續推出多項「綠色管理」行動，包括：(a) 發布符合 GRI (The Global Reporting Initiative) 指標的永續報告書；(b) 採用部分再生材料製作「環保系列」商品；(c) 要求主要供應商取得 ISO 14000 認證等。然而，該企業的核心商業模式仍高度依賴快速設計、低成本生產與高銷量，外界亦質疑其綠色行動是否僅止於回應市場與評比需求，而未真正改變其對環境的整體衝擊。企業內部高階管理團隊亦出現分歧：一派主張應逐步朝「積極途徑」深化綠色管理，另一派則擔憂此舉將削弱成本優勢與市場競爭力。

(2-1) 請結合「守法途徑、市場途徑、利害關係人途徑與積極途徑」四種綠色管理模式，分析該快時尚企業目前較接近哪一種綠色管理途徑？請說明理由。(5%)

(2-2) 若你是該企業的高階管理者，面對環保壓力與競爭並存的情境，你是否支持進一步朝更高「綠蔭濃度」(Shade of Green)的綠色管理途徑發展？請說明你的管理考量與可能風險。(10%)

(2-3) 在此情境下，GRI、ISO 等綠色管理評估工具，對管理者而言有哪些價值？又可能存在哪些限制或「漂綠」(Greenwashing) 風險？請說明其管理意涵。(10%)

考試科目	管理學	系所別	企業管理研究所 (MBA 學位學程)	考試時間	2 月 6 日(五) 第 4 節

3. 在高度不確定與快速變動的環境下（如數位轉型、AI 導入或組織策略變革），企業往往必須持續進行組織變革。然而，變革一方面削弱傳統管理控制機制的穩定性，另一方面又容易引發員工的不安與抗拒，使管理者同時面臨「維持控制」與「促進彈性」之間的管理兩難。

(3-1) 在持續變革的情境下，管理者應如何重新思考「控制 (control)」的角色與方式？(5%)
請分析它在目標設定、監督方式或管理假設上，與傳統管理控制有何不同？(10%)

(3-2) 管理者可如何在「必要的控制」與「員工自主與心理安全」之間取得平衡，以降低員工對變革的抗拒，並維持組織運作的穩定性？ 請結合理論觀點加以說明，並說明其管理意涵與可能的限制。(10%)

4. 某科技公司在三年內快速成長，團隊成員來自不同國家與專業背景，包括工程師、產品經理與資料分析師。隨著市場競爭加劇，公司必須在高度不確定的環境下，持續推出創新產品並快速修正方向。該部門主管並未採取高度集權的管理方式。他很少以職位權力直接下達命令，也極少以懲罰或獎賞作為主要管理工具。相反地，他傾向在關鍵時刻提出大方向的建議，鼓勵團隊成員基於專業做出決策，並在跨部門與跨文化衝突出現時，主動促進溝通與理解。團隊成員普遍認為這位主管「值得信任」，即使在壓力較大的專案期間，成員仍願意主動回報問題與錯誤，而非隱瞞風險。慢慢地，團隊的運作愈來愈成熟，許多決策不再需要主管介入，部門績效與成員滿意度皆持續提升。

(4-1) 請分析該主管在案例中主要運用了哪些類型的領導者權力？並說明這些權力如何影響部屬的行為與績效。(10%)

(4-2) 在此案例中，是否存在某些來自部屬特質、工作本身或組織設計的因素，使得部屬對正式領導行為的依賴降低？請說明「有效的領導，有時就是不領導」的管理意涵。(15%)

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	企業管理學研究所(MBA 學位學程)乙組	考試時間	2 月 6 日(五) 第 四 節

Show all your work to earn the credits.

1. Evaluate each of the following limits:

   (a) (10 points) $\lim_{x\to-\infty} \dfrac{\sqrt{9x^2+3}}{4x-1}$

   (b) (10 points) $\lim_{x\to 0}\left(\dfrac{1}{2x^2}+\dfrac{1}{x^3}+\dfrac{1}{x^4}-\dfrac{e^{\sin x}}{x^4}\right)$

2. Find each of the following derivatives:

   (a) (10 points) Find $f'(x)$ for $f(x)=\ln(x^3(4x+1)^5)$.

   (b) (10 points) Find $g^{(83)}(0)$, the 83th-order derivative of $g(x)=x^2\arctan(x)$.

3. Evaluate each of the following integrals:

   (a) (10 points) $\int\left(\dfrac{2}{\cos^2 x}\sqrt{6+\dfrac{\sin x}{\cos x}}+x\right)dx$

   (b) (10 points) $\int_0^2\int_{y/2}^1 e^{3x^2+2}dxdy$

   (c) (10 points) $\int\dfrac{4}{\sin^3 x}dx$

4. Let $F(x)=\int_0^x \sqrt{t}\sin t dt$.

   (a) (3 points) Find all the critical point(s), if any, for the function $F(x)$.

   (b) (3 points) Decide whether $F(x)$ has a local maximum or a local minimum at $x=\pi$. Provide a justification for your answer.

   (c) (4 points) Let $G(x)=\int_0^x t^2\sin(t^2)dt$. Find the constants a, b, c and d such that $G(x)=aF(bx^2+cx+d)$.

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	企業管理學研究所(MBA 學位學程)乙組	考試時間	2 月 6 日(五) 第 四 節

5. (10 points) Let the demand and supply curves be

$$D(q) = \frac{250}{q+20} \quad \text{and} \quad S(q) = q + 5,$$

respectively. Find the equilibrium point, consumer's surplus and producer's surplus.

6. (10 points) A company manufactures two products, A and B. Let x be the number of units of product A produced and y be the number of units of product B produced. Because of limited materials and capital, the quantities produced must satisfy the equation $4x + 2y = 80$. Let the company's profit function is $P(x, y) = x^3 + 2y^2$. Find the production levels of products A and B that maximize the company's profit.

備註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

國立政治大學　115　學年度　碩士班暨碩士在職專班 招生考試試題

考試科目	管理學	系所別	企業管理研究所 (MBA 學位學程)	考試時間	2 月 6 日(五) 第 4 節

以下共 4 大題（每題 25 分），作答時請清楚標明題號，以利閱卷。

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(2-1) 請結合「守法途徑、市場途徑、利害關係人途徑與積極途徑」四種綠色管理模式，分析該快時尚企業目前較接近哪一種綠色管理途徑？請說明理由。(5%)

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考試科目	管理學	系所別	企業管理研究所 (MBA學位學程)	考試時間	2月6日(五)第4節

3. 在高度不確定與快速變動的環境下（如數位轉型、AI 導入或組織策略變革），企業往往必須持續進行組織變革。然而，變革一方面削弱傳統管理控制機制的穩定性，另一方面又容易引發員工的不安與抗拒，使管理者同時面臨「維持控制」與「促進彈性」之間的管理兩難。

(3-1) 在持續變革的情境下，管理者應如何重新思考「控制 (control)」的角色與方式？(5%)
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4. 某科技公司在三年內快速成長，團隊成員來自不同國家與專業背景，包括工程師、產品經理與資料分析師。隨著市場競爭加劇，公司必須在高度不確定的環境下，持續推出創新產品並快速修正方向。該部門主管並未採取高度集權的管理方式。他很少以職位權力直接下達命令，也極少以懲罰或獎賞作為主要管理工具。相反地，他傾向在關鍵時刻提出大方向的建議，鼓勵團隊成員基於專業做出決策，並在跨部門與跨文化衝突出現時，主動促進溝通與理解。團隊成員普遍認為這位主管「值得信任」，即使在壓力較大的專案期間，成員仍願意主動回報問題與錯誤，而非隱瞞風險。慢慢地，團隊的運作愈來愈成熟，許多決策不再需要主管介入，部門績效與成員滿意度皆持續提升。

(4-1) 請分析該主管在案例中主要運用了哪些類型的領導者權力？並說明這些權力如何影響部屬的行為與績效。(10%)

(4-2) 在此案例中，是否存在某些來自部屬特質、工作本身或組織設計的因素，使得部屬對正式領導行為的依賴降低？請說明「有效的領導，有時就是不領導」的管理意涵。(15%)

備註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。