考試科目	經濟學	系所別	商學院共同科	考試時間	2月 7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.

1. Suppose Ethan increases his working hours when obtaining higher hourly pay. Which of the following statement(s) is (are) correct?

(i) Leisure could be an inferior good to Ethan.

(ii) Leisure could be a normal good to Ethan.

(iii) Leisure could be a Giffen good to Ethan.

A. (i) and (iii)

B. (ii)

C. (i) and (ii)

D. (i), (ii), and (iii)

2. Which of the following statement(s) is (are) correct when a government imposes tax on a good?

(i) When supply is perfectly inelastic, imposing tax on consumers creates zero deadweight loss.

(ii) When demand is perfectly elastic, imposing tax makes the market price of the good unchanged.

(iii) When supply is perfectly elastic, and demand is perfect inelastic, imposing tax makes the market equilibrium quantity unchanged.

A. (i) and (iii)

B. (ii)

C. (i) and (ii)

D. (i), (ii), and (iii)

3. Which of the following statement(s) is(are) correct?

(i) A monopoly firm can increase its revenue by raising the price when demand is perfectly inelastic.

(ii) When marginal cost is zero and demand is linear, a monopolistic competitive firm will produce at the midpoint of the demand curve.

(iii) A perfect competitive firm produces at the point that price elasticity of demand equals one.

A. (i) and (iii)

B. (ii)

C. (i) and (ii)

D. (i), (ii), and (iii)

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 7 日(五) 第二節

4. Assume Ethan's preference on two goods, X and Y, follows typical assumptions in Economics. His budget constraint is $2X + 4Y = 20$, and his optimal consumption bundle is $(2, 4)$. Which of the following consumption bundles is possible to give the same utility level to Ethan as $(2, 4)$?

A. (3, 7)

B. (5, 2.5)

C. (0.5, 4)

D. (1, 7)

5. Town A has only three residents. They are deciding whether to spend $ 450 to provide a public good. The public good will only be provided when all of three residents agree to do it. The value of the public good to each resident is:

Resident A	Resident B	Resident C
i	ii	iii

What is a possible bundle of (i, ii, iii) that this public good will be provided?

A. (0, 0, 460)

B. (100, 150, 130)

C. (120, 150, 160)

D. (140, 140, 140)

6. When marginal cost exceeds average total cost,

A. average fixed cost must be falling.

B. average fixed cost must be rising.

C. average total cost must be rising.

D. average total cost is falling.

7. If a firm in a competitive market increases production and its marginal revenue remains positive, raising production will

A. be profitable.

B. cause the firm to incur loses.

C. leave profit unchanged.

D. It is impossible to tell from the information provided.

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 7 日（五）第二節

8. When a natural monopoly exists, it is
   A. always more cost effective for two or more private firms to produce the product.
   B. never more cost effective for two or more private firms to produce the product.
   C. always more cost effective for government owned firms to produce the product.
   D. never more cost effective for one firm to produce the product.

9. If identical products are sold by firms participating in a market, the market is
(i) perfectly competitive.
(ii) an oligopoly.
(iii) monopolitically competitive.
   A. (i) or (ii)
   B. (ii) or (iii)
   C. (i) or (iii)
   D. (i) only

10. A profit-maximizing firm in a monopolistically competitive market is characterized by which of the following?
   A. Revenue is always maximized along with profit.
   B. Average revenue exceeds marginal revenue.
   C. Marginal revenue exceeds average revenue.
   D. Average revenue is equal to marginal revenue.

11. Every year more and more purchases are made with credit cards on the Internet. Given this trend, all else equal, we would expect:
   A. the money demand curve to shift outward.
   B. the money demand curve to shift inward.
   C. a downward movement along a fixed money demand curve.
   D. an upward movement along a fixed money demand curve.

12. As a result of a decrease in the value of the dollar in relation to other currencies, American imports decrease and exports increase. Consequently, there is a(n):
   A. increase in short-run aggregate supply.
   B. decrease in the quantity of aggregate output supplied in the short run.
   C. increase in aggregate demand.
   D. decrease in the quantity of aggregate output demanded.

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 7 日(五) 第二節

13. The money demand curve is:

A. downward-sloping because the opportunity cost of holding money is inversely related to the interest rate.

B. downward-sloping because the opportunity cost of holding money rises as the interest rate rises.

C. downward-sloping because the opportunity cost of holding money rises as the interest rate falls.

D. upward-sloping because the opportunity cost of holding money rises with the interest rate.

14. An example of the frictionally unemployed is a(n):

A. autoworker who is temporarily laid off because of a decline in sales.

B. geologist who is permanently laid off from an oil company due to a new technological advance.

C. worker at a fast-food restaurant who quits work and attends college.

D. real estate agent who leaves a job in Texas and searches for a similar, higher paying job in California.

15. Suppose that in year 1 an economy produces 100 baseballs that sell for $3 each and 75 pizzas that sell for $8 each. The next year the economy produces 110 baseballs that sell for $3.25 each and 80 pizzas that sell for $9 each. Using year 1 as the base year, the growth rate of real GDP from year 1 to Year 2 is:

A. 10%.

B. 7.8%.

C. 19.7%.

D. 8.8%.

16. Suppose the economy is in long-run equilibrium. Concerns about pollution cause the government to significantly restrict the production of electricity. At the same time, taxes fall. In the short-run

A. real GDP will rise, and the price level might rise, fall, or stay the same.

B. real GDP will fall, and the price level might rise, fall, or stay the same.

C. the price level will rise, and real GDP might rise, fall, or stay the same.

D. the price level will fall, and real GDP might rise, fall, or stay the same.

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 7 日（五）第二節

17. Critics of stabilization policy argue that
A. "animal spirits" must be offset by active monetary policy.
B. active monetary policy is necessary for steady economic growth.
C. the lag problem ends up being a cause of economic fluctuations.
D. active fiscal policy is required for steady economic growth.

18. Which of the following contains a list only of things that decrease when the budget deficit of the U.S. increases?
A. U.S. net exports, U.S. domestic investment, U.S. net capital outflow
B. U.S. supply of loanable funds, U.S. interest rates, U.S. domestic investment
C. U.S. imports, U.S. interest rates, the real exchange rate of the dollar
D. U.S. interest rates, the real exchange rate of the dollar, U.S. domestic investment

19. If purchasing power parity holds, then if the price of a basket of goods in the U.S. rose from $1,000 to $1,200 and the price of the same basket in Poland rose from 6,400 Polish zloty to 8,000 zloty, then
A. the nominal exchange rate would be unchanged and the real exchange rate would appreciate.
B. the U.S. dollar would appreciate and the real exchange rate would stay the same.
C. the nominal exchange rate would be unchanged and the real exchange rate would depreciate.
D. the U.S. dollar would depreciate and the real exchange rate would be unchanged.

20. Imagine the U.S. economy is in long-run equilibrium. Then suppose the value of the U.S. dollar decreases. At the same time, people in the U.S. revise their expectations so that the expected price level rises. We would expect that in the short-run
A. real GDP will rise and the price level might rise, fall, or stay the same.
B. real GDP will fall and the price level might rise, fall, or stay the same.
C. the price level will rise, and real GDP might rise, fall, or stay the same.
D. the price level will fall, and real GDP might rise, fall, or stay the same.

考試科目	經濟學	系所別	商學院共同科	考試時間	2 月 7 日(五) 第二節

Problems and Short-essay Questions

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

1. Assume a government imposes a tax on the market of good A. The total tax revenue is \$500, and the quantity demanded is 100. Further, the demand is linear and has a slope of $-\frac{1}{5}$. The supply equation is $Q^S = 2P$.

A. (4 points) What is the price that consumers pay after the tax?

B. (4 points) What is the demand equation?

C. (4 points) What is the size of the deadweight loss of the taxation?

D. (4 points) What is the tax burden of consumers?

E. (4 points) Additionally, assume the government imposes this tax to deal with externality efficiently. What is the size of the externality per output unit? Is this externality positive or negative?

2. Consider an endowment economy (an economy without production). The utility function of each consumer is $U = D_x^{1/2} D_y^{1/2}$, where D_x and D_y represent demand of x and y respectively. The endowment of x is 20 units and that of y is 30 units. Answer the following questions.

A. (5 points) Show that the utility function is homothetic.

B. (5 points) Derive the demand of x relative to y as a function of p_x/p_y where p represents price.

C. (5 points) Derive the equilibrium level of p_x/p_y.

D. (5 points) Suppose there is another economy, where consumers have the same utility function but both the endowment of x and y is 30 units. Derive the equilibrium level of p_x/p_y under free trade.

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 7日(五) 第二節

3. Given the following information: bank deposits 350, currency-to-deposits ratio 0.20, required reserve ratio 0.15,

A. (15 points) solve for the monetary base level, the level of bank reserves, and the money supply level in this economy.

B. (5 points) Suppose there is a sudden rise in the currency-to-deposits ratio, from the original level of 0.2 to a new level of 0.4. If everything else remains unchanged, find the level of monetary base needed to keep money supply fixed at the same level.

4. One example of how inflation discourages saving is the tax treatment of capital gains. Suppose that someone bought a parcel of land for $2,000 in 1980 when the price index equaled 100. In 2018, the person sold the land for $13,000, and the price index equaled 500. The tax rate on nominal gains was 20 percent.

A. (5 points) Find the before-tax real rate of capital gains.

B. (5 points) Compute the taxes on the nominal gains in terms of 2018 prices.

C. (5 points) Compute the after-tax real value of the land in terms of 1980 prices.

D. (5 points) Find the after-tax real rate of caiptal gains.

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	企業管理研究所 (甲組)	考試時間	2 月 7 日(五) 第 四 節

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

1. **(15%)** Phone calls arrive at the rate of 48 per hour at the reservation desk for an airways company.
   (1) Compute the probability of receiving three calls in a 10-minute interval of time. (7%)
   (2) Suppose no calls are currently on hold. If the agent takes 5 minutes to complete the current call, how many callers do you expect to be waiting by the time? What is the probability that none will be waiting? (8%)

2. **(15%)** Suppose that for one email account, 1 in every 10 messages is spam. The proportions of spam messages that have the five most common words in spam email are given below, together with those of ham messages (email not considered to be spam).

	spam	ham
shipping!	0.051	0.015
today!	0.045	0.022
here!	0.034	0.022
available!	0.014	0.041
fingertips!	0.014	0.011

   (1) If a message includes the word *available!*, what is the probability the message is spam? (7%)
   (2) If a message includes the word *shipping!*, what is the probability the message is ham? (8%)

3. **(35%)** 自 2019 年六都的購屋貸款人資料中隨機分別抽取 100 人，下表為其年收入（X，單位：萬）分布：

年收入	台北市	新北市	桃園市	台中市	台南市	高雄市
$0 \le X \le 60$	24	35	39	37	41	38
$60 < X \le 80$	10	15	18	16	17	18
$80 < X \le 100$	12	15	15	14	15	16
$100 < X \le 150$	54	35	28	33	27	28

   (1) 估計桃園市購屋貸款人年收入之平均數與變異數。 (10%)
   (2) 檢定台北市購屋貸款人之年收入大於 100 萬者的比例是否大於其他五都的比例（其他五都合併考

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	企業管理研究所 (甲組)	考試時間	2 月 7 日(五) 第 四 節

慮）？ （10%）

(3) 檢定購屋貸款人之年收入與購屋城市是否有關？ （15%）

4. **(35%)** The data below are randomly taken from 30 suburb commercial properties by a real estate company in order to provide clients with quantitative information upon which to make rental decision. Shown here are the age (X_1), operating expenses and taxes (X_2), vacancy rate (X_3), total square footage (X_4), and rental rates (Y).

Y	X_1	X_2	X_3	X_4	Y	X_1	X_2	X_3	X_4
13.500	1	5.02	0.14	123000	17.000	1	12.01	0.00	299000
12.000	14	8.19	0.27	104079	16.000	1	7.99	0.14	189258
10.500	16	3.00	0.00	39998	14.625	12	10.33	0.12	366013
15.000	4	10.70	0.05	57112	14.500	16	10.67	0.00	349930
14.000	11	8.97	0.07	60000	14.500	3	9.45	0.03	85335
10.500	15	9.45	0.24	101385	16.500	6	12.65	0.13	235932
14.000	2	8.00	0.19	31300	16.500	3	12.08	0.00	130000
16.500	1	6.62	0.60	248172	15.000	3	10.52	0.05	40500
17.500	1	6.20	0.00	215000	15.000	3	9.47	0.00	40500
16.500	8	11.78	0.03	251015	13.000	14	11.62	0.00	45959
17.000	12	14.62	0.08	291264	12.500	1	5.00	0.33	120000
16.500	2	11.55	0.03	207549	14.000	15	9.89	0.05	81243
16.000	2	9.63	0.00	82000	13.750	16	11.13	0.06	153947
16.500	13	12.99	0.04	359665	14.000	2	7.96	0.22	97321
17.225	2	12.01	0.03	265500	15.000	16	10.73	0.09	276099

The following table shows the estimation output.

	Estimate	Standard error
Constant	12.4509	0.7668
X_1	-0.1996	0.0281
X_2	0.2772	0.0784
X_3	-2.3196	1.4302
X_4/1000	0.0083	0.0018

R^2=0.8055

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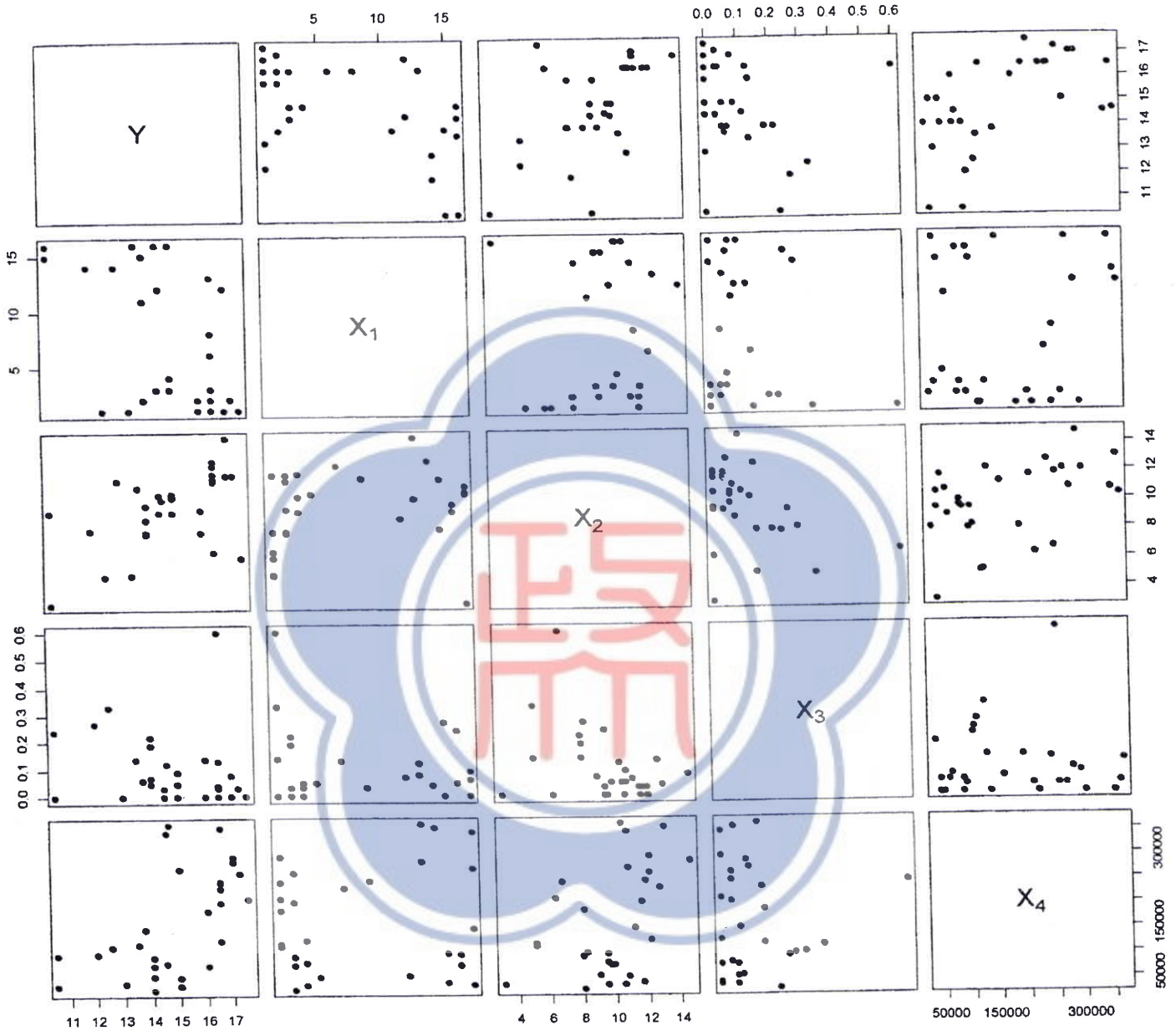
Here is the scatter matrix for these data.



(1) Construct the 99% confidence interval for the population mean of rental rates. (8%)

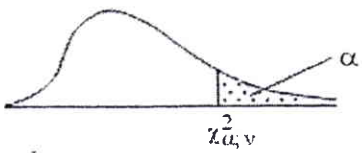
(2) Examine which variables could be omitted from the regression model. (8%)

(3) Construct the ANOVA table for the regression analysis. (8%)

(4) What will the estimates and R^2 change if you divide X_4 by 10000? (6%)

(5) Please give two suggestions to enrich the further analysis for these data, based on the above information/estimation provided and you obtained. (5%)

考試科目	統計學	系所別	企業管理研究所(甲組)	考試時間	2 月 7 日(五) 第 四 節



v=df

Table of Probabilities for the Chi-Squared Distribution

Alpha Risk

df	0.995	0.990	0.975	0.95	0.9	0.75	0.5	0.25	0.1	0.05	0.25	0.01	0.005	0.001
1	0.000039	0.000157	0.000982	0.00393	0.0158	0.102	0.455	1.323	2.706	3.841	1.323	6.635	7.879	10.828
2	0.010	0.020	0.051	0.103	0.211	0.575	1.386	2.773	4.605	5.991	2.773	9.210	10.597	13.816
3	0.072	0.115	0.216	0.352	0.584	1.213	2.366	4.108	6.251	7.815	4.108	11.345	12.838	16.266
4	0.207	0.297	0.484	0.711	1.064	1.923	3.357	5.385	7.779	9.488	5.385	13.277	14.860	18.467
5	0.412	0.554	0.831	1.145	1.610	2.675	4.351	6.626	9.236	11.070	6.626	15.086	16.750	20.515
6	0.676	0.872	1.237	1.635	2.204	3.455	5.348	7.841	10.645	12.592	7.841	16.812	18.548	22.458
7	0.989	1.239	1.690	2.167	2.833	4.255	6.346	9.037	12.017	14.067	9.037	18.475	20.278	24.322
8	1.344	1.646	2.180	2.733	3.490	5.071	7.344	10.219	13.362	15.507	10.219	20.090	21.955	26.124
9	1.735	2.088	2.700	3.325	4.168	5.899	8.343	11.389	14.684	16.919	11.389	21.666	23.589	27.877
10	2.156	2.558	3.247	3.940	4.865	6.737	9.342	12.549	15.987	18.307	12.549	23.209	25.188	29.588
11	2.603	3.053	3.816	4.575	5.578	7.584	10.341	13.701	17.275	19.675	13.701	24.725	26.757	31.264
12	3.074	3.571	4.404	5.226	6.304	8.438	11.340	14.845	18.549	21.026	14.845	26.217	28.300	32.909
13	3.565	4.107	5.009	5.892	7.042	9.299	12.340	15.984	19.812	22.362	15.984	27.688	29.819	34.528
14	4.075	4.660	5.629	6.571	7.790	10.165	13.339	17.117	21.064	23.685	17.117	29.141	31.319	36.123
15	4.601	5.229	6.262	7.261	8.547	11.037	14.339	18.245	22.307	24.996	18.245	30.578	32.801	37.697
16	5.142	5.812	6.908	7.962	9.312	11.912	15.338	19.369	23.542	26.296	19.369	32.000	34.267	39.252
17	5.697	6.408	7.564	8.672	10.085	12.792	16.338	20.489	24.769	27.587	20.489	33.409	35.718	40.790
18	6.265	7.015	8.231	9.390	10.865	13.675	17.338	21.605	25.989	28.869	21.605	34.805	37.156	42.312
19	6.844	7.633	8.907	10.117	11.651	14.562	18.338	22.718	27.204	30.144	22.718	36.191	38.582	43.820
20	7.434	8.260	9.591	10.851	12.443	15.452	19.337	23.828	28.412	31.410	23.828	37.566	39.997	45.315
21	8.034	8.897	10.283	11.591	13.240	16.344	20.337	24.935	29.615	32.671	24.935	38.932	41.401	46.797

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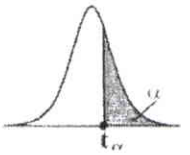
Percentage Points of the *t* Distribution; $t_{\nu,\alpha}$

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



	α													
ν	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
∞	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

國立政治大學 109 學年度 碩士暨碩士在職專班 招生考試試題

考試科目	管理學	系所別	企研所	考試時間	2月7日(五)第四節

1. (30%) 溝通是一項重要的管理工作。成功的管理者利用溝通作為規劃、鼓勵，及指導行為的工具。
   a. (10%) 「無效的溝通是由送訊者所造成的」。你同不同意這句話？為什麼？
   b. (10%) 請說明並比較組織內常見的三種溝通網路 (communication networks)。
   c. (10%) 根據調查顯示，員工一天約有 28% 的時間是花在處理不重要或不緊急的事件上，如：非必要的電子郵件。請問這對管理者的意涵為何？如果你是管理者，是否會採取任何策略？為什麼？

2. (30%) 對於組織及管理者而言，「變革 (change)」是一種常態。例如：近年來，華碩集團透過組織調整與手機策略轉型，希望能加速集團內部的傳承，並持續事業上的發展。
   a. (10%) 請說明促使企業進行變革的內部與外部的力量及因素有哪些？
   b. (10%) 面對變革，組織內的員工有可能將其視為威脅。請說明人員為何會抗拒變革？身為管理者，該如何減少員工對變革可能有的抗拒？
   c. (10%) 變革可能帶來創新。然而，創新必須容許員工犯錯，而犯錯過多可能影響員工的考績。從管理者角度而言，請說明你能用哪些激勵理論或方法，來鼓勵與支持員工在「創新」上的努力？

3. (40%) 倫理是道德研究的重要課題之一，而道德是人們評斷是非對錯的標準。個人的倫理信念會受到生活經驗、社會文化與個人價值觀所影響，於企業而言，管理者的倫理信念也將影響企業對於社會責任的表現。
   a. (10%) 請說明企業社會責任與企業經濟績效之間的關聯。
   b. (10%) 請各舉三例說明管理者在公司內部與外部可能會面臨的道德兩難問題。
   c. (20%) 「B 型企業（B Corporation）」及「社會企業 (Social Enterprise)」是近年來受到注目的企業型態。請說明非營利組織 (Non-Profit Organization)、「社會企業」與「B 型企業」之定義及異同。

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	企業管理研究所 (MBA 學位學程乙組)	考試時間	2 月 7 日(五) 第四節

1. (30 points) Let $f(x)$ be the probability density function of a normal distribution with mean μ and variance σ^2. Let

$$g(x) = 10x + 20\int_{-\infty}^{x}(t-x)f(t)dt.$$

   (a) (10 points) Find the critical points of $g(x)$.

   (b) (20 points) Find the local extreme values of $g(x)$, and determine whether they are local maxima, local minima, global maxima, or global minima.

2. (40 points) Suppose that the price equation is $p = 200 - 3x$, and the cost function is $C(x) = 75 + 80x - x^2$, $0 \le x \le 40$.

   (a) (10 points) Determine the value of x and the corresponding price that maximize the profit.

   (b) (10 points) If the government imposes a tax of \$4 per unit quantity produced, determine the new price that maximizes the profit.

   (c) (10 points) Suppose that the government imposes a tax of T dollars per unit quantity produced, where $0 \le T \le 120$. Determine the value of x that maximizes the profit.

   (d) (10 points) Assume that the company cut back production to the level you obtained in (c). Express the tax revenues received by the government as a function of T, and determine the value of T that will maximize the tax revenue received by the government.

3. (15 points) Use Newton's method to perform four iterations to find a local extremum of $f(x) = x^3 - 2x^2 + 2$ with $x_0 = 3/4$.

4. (15 points) Obtain the Taylor expansion for $\log(1-x)$ for $-1 \le x < 1$. Then, use it to obtain a formula for $\log 2$.

備註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。