國立臺北大學112學年度碩士班一般入學考試試題

系（所）組別：經濟學系

科　　目：統計學

☑可 ☐不可使用計算機

I. 選擇題（共30%；每題5%）

1. If the moment generating function of X is $M(t) = (\frac{1}{4} + \frac{3e^t}{4})^{12}$, what is standard deviation of X?

(A) 2.25
(B) 1.5
(C) 0.39
(D) 9

2. Let x_1 and x_2 have the joint probability density function (p.d.f.) $f(x,y) = \frac{x+y}{21}$, $x = 1,2,3$, $y = 1,2$,

The conditional p.d.f. of $f(x = 3|y = 2)$ is

(A) 1/4
(B) 1/3
(C) 3/5
(D) 5/12

3. If X is a random variable with mean 25 and variance 16, what is the lower bound for $P(|X - 25| \geq 12)$?

(A) 0.111
(B) 0.75
(C) 0.25
(D) 0.889

4. Let the random variable X is given by the p.d.f. $f(x) = \frac{1}{10}e^{-x/10}$

What is the probability $P(X > 40|X > 10)$is ?

(A) e^{-2}
(B) e^{-4}
(C) e^{-3}
(D) $e^{-4} - e^{-1}$

5. Let $\bar{X}$ be the mean of a random sample of size 12 from the uniform distribution on the interval (0,1). What is the approximation probability of $P(1/2 \leq \bar{X} \leq 2/3)$?

(A) 0.685
(B) 0.315
(C) 0.528
(D) 0.472

6. Let $f(x,y) = e^{-x-y}$, $0 < x < \infty$, $0 < y < \infty$, be the joint p.d.f. of X and Y. What is $P(X > 1, Y > 1)$

(A) e^{-2}
(B) 0.5
(C) $1 - e^{-2}$
(D) 0.25

試題隨卷繳交　　接背面

II. 計算題（共 20%；各題配分如括號所示）

1. (10%) Let the p.d.f of X be defined by $f(x) = {}^{x^3}/_{9}$ $0 < x < 3$, zero elsewhere. Find the p.d.f. of $Y = X^3$.

2. (10%) Let X_1, $X_{2,\ldots,}X_n$ denote a random sample from a distribution with p.d.f. $f(x;\theta) = \begin{cases} \theta x^{\theta-1}, 0 < x < 1, \\ 0, \quad elsewhere \end{cases}$

   where $0 < \theta$. Whether the product $u_1 = (X_1, X_2, \ldots, X_n) = X_1 X_2 \cdots X_n$ is the sufficient statistic for θ?

III. 填空題（共 35%；每格 5%）

請在答案卷標示大題「III」及小題號「(1)、(2)、(3)、(4)、(5)、(6) 及 (7)」，並依序填入對應答案，不需另外標示 Question 1、2 等題號。答案可得明確數值者，請寫下該數值並四捨五入進位至小數第四位。

Question 1

A sample of 30 weeks (indicated by the subscript t) comes from a small village for us to estimate the following ice cream demand equation:

$$\ln cons_t = \beta_1 + \beta_2 \ln income_t + \beta_3 \ln price_t + \beta_4 tempF_t + \varepsilon_t.$$

The above four time-series variables are logarithmic per-capita weekly consumption of ice cream ($cons_t$, in pints), logarithmic per-capita weekly income ($income_t$, in dollars), logarithmic price of ice cream ($price_t$, in dollars per pint) and average weekly temperature ($tempF_t$, in degrees Fahrenheit), respectively. ε_t is white noise. The OLS estimation result shows:

- $\hat{\beta}_1 = -5.8569$ and s.e.$(\hat{\beta}_1) = 1.3084$ (s.e.(X) denotes the standard error of X)
- $\hat{\beta}_2 = 0.7982$ and s.e.$(\hat{\beta}_2) = 0.2605$
- $\hat{\beta}_3 = -0.6262$ and s.e.$(\hat{\beta}_3) = 0.5947$
- $\hat{\beta}_4 = 0.0096$ and s.e.$(\hat{\beta}_4) = 0.0012$
- $R^2 = 0.7405$ and sample size $T = 30$

First, the 95% confidence interval of the income elasticity of demand for ice cream is __(1)__; and the 95% confidence interval of the price elasticity of demand for ice cream is__(2)__. Next, if someone measured temperature in degrees Celsius ($tempC_t$) rather than in degrees Fahrenheit, the ice cream demand equation will be changed to:

$$\ln cons_t = \alpha_1 + \alpha_2 \ln income_t + \alpha_3 \ln price_t + \alpha_4 tempC_t + \varepsilon_t,$$

$$\text{where } tempC_t = \frac{5}{9} \times (tempF_t - 32).$$

The above alternative estimation of ice cream demand equation will give us $\hat{\alpha}_1 =$ __(3)__, $\hat{\alpha}_4 =$ __(4)__, and s.e.$(\hat{\alpha}_4) =$ __(5)__.

Question 2

Consider the following model: $Y_i = \alpha_1 + \alpha_2(X_i - \bar{X}) + \varepsilon_i$ ($i = 1,2,\ldots,N$), where ε_i is white noise and $\mathrm{Var}(\varepsilon_i) = \sigma^2 = 50$. A random sample of size $N = 10$ is taken for X_i and Y_i and shown below.

i	1	2	3	4	5	6	7	8	9	10
X	8	7	7	2	5	9	9	5	3	2
Y	53	48	44	39	50	49	54	50	39	34

The estimated $\hat{\alpha}_1$=__(6)__ and $\mathrm{Var}(\hat{\alpha}_1)$ =__(7)__.

IV. 計算與申論題（15%）

請在答案卷標示大題「IV」並陳述對應答案，不需另外標示 Question 1 的題號。陳述過程中若有明確數值者，請寫下該數值並四捨五入進位至小數第四位。

Question 1

In the classical macroeconomic theory, final output Y is determined by inputs of labor (L) and stock of physical capital (K) under a Cobb–Douglas production function (at any given country i) as $Y_i = A_i K_i^{\beta_1} L_i^{\beta_2}$, where A represents total factor productivity (or so-called Solow residual), and β_1 and β_2 are some parameters that measure the contributions of the two inputs. We assume that the logarithmic Solow residual is $\ln A_i = a + \varepsilon_i$, where a is some constant and ε_i represents country-specific effects. It was said that constant returns to scale (CRTS) is an average surviving principle across industries, so please perform a formal "step-by-step" hypothesis test, at 5% level of significance, to see if CRTS exists in our sample. You are given the sum of squared residuals (SSR) from the two models as follows. Both models are estimated based on the same sample with a size $N = 123$.

- Unrestricted Model: $\ln Y_i = \hat{\beta}_0 + \hat{\beta}_1 \ln K_i + \hat{\beta}_2 \ln L_i$, $SSR_U = 19.9601$
- Restricted Model: $(\ln Y_i - \ln L_i) = \hat{\alpha}_0 + \hat{\alpha}_1(\ln K_i - \ln L_i)$, $SSR_R = 20.4642$

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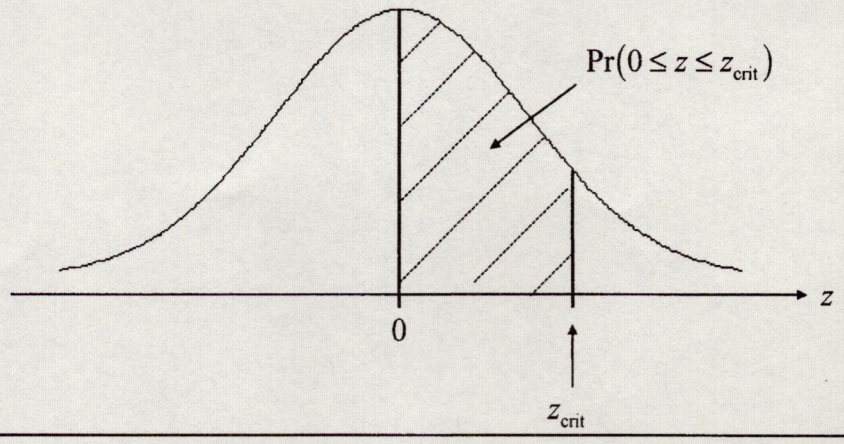
STATISTICAL TABLES

TABLE 1: AREAS UNDER THE STANDARDIZED NORMAL DISTRIBUTION



z	0.0	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	0.2967	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	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	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	0.4772	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
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990

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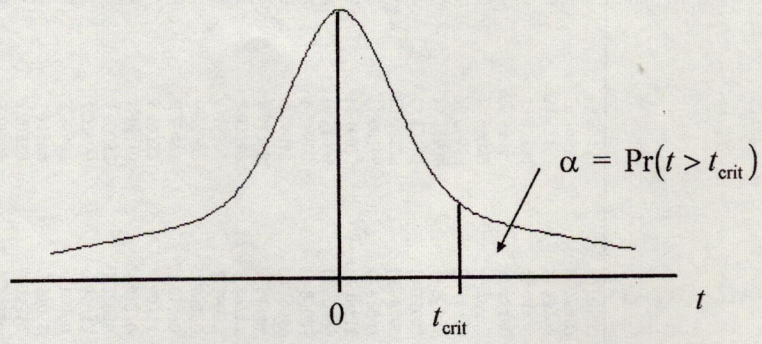
TABLE 2: STUDENT *t* DISTRIBUTION: CRITICAL VALUES

For a particular number of degrees of freedom ν, each entry represents the value of *t* corresponding to a specified upper tail area a.



Degrees of Freedom ν	Upper Tail Areas, α					
	.25	.10	.05	.025	.01	.005
1	1.0000	3.0777	6.3137	12.7062	31.8210	63.6559
2	0.8165	1.8856	2.9200	4.3027	6.9645	9.9250
3	0.7649	1.6377	2.3534	3.1824	4.5407	5.8408
4	0.7407	1.5332	2.1318	2.7765	3.7469	4.6041
5	0.7267	1.4759	2.0150	2.5706	3.3649	4.0321
6	0.7176	1.4398	1.9432	2.4469	3.1427	3.7074
7	0.7111	1.4149	1.8946	2.3646	2.9979	3.4995
8	0.7064	1.3968	1.8595	2.3060	2.8965	3.3554
9	0.7027	1.3830	1.8331	2.2622	2.8214	3.2498
10	0.6998	1.3722	1.8125	2.2281	2.7638	3.1693
11	0.6974	1.3634	1.7959	2.2010	2.7181	3.1058
12	0.6955	1.3562	1.7823	2.1788	2.6810	3.0545
13	0.6938	1.3502	1.7709	2.1604	2.6503	3.0123
14	0.6924	1.3450	1.7613	2.1448	2.6245	2.9768
15	0.6912	1.3406	1.7531	2.1315	2.6025	2.9467
16	0.6901	1.3368	1.7459	2.1199	2.5835	2.9208
17	0.6892	1.3334	1.7396	2.1098	2.5669	2.8982
18	0.6884	1.3304	1.7341	2.1009	2.5524	2.8784
19	0.6876	1.3277	1.7291	2.0930	2.5395	2.8609
20	0.6870	1.3253	1.7247	2.0860	2.5280	2.8453
21	0.6864	1.3232	1.7207	2.0796	2.5176	2.8314
22	0.6858	1.3212	1.7171	2.0739	2.5083	2.8188
23	0.6853	1.3195	1.7139	2.0687	2.4999	2.8073
24	0.6848	1.3178	1.7109	2.0639	2.4922	2.7970
25	0.6844	1.3163	1.7081	2.0595	2.4851	2.7874
26	0.6840	1.3150	1.7056	2.0555	2.4786	2.7787
27	0.6837	1.3137	1.7033	2.0518	2.4727	2.7707
28	0.6834	1.3125	1.7011	2.0484	2.4671	2.7633
29	0.6830	1.3114	1.6991	2.0452	2.4620	2.7564
30	0.6828	1.3104	1.6973	2.0423	2.4573	2.7500
31	0.6825	1.3095	1.6955	2.0395	2.4528	2.7440
32	0.6822	1.3086	1.6939	2.0369	2.4487	2.7385
33	0.6820	1.3077	1.6924	2.0345	2.4448	2.7333
34	0.6818	1.3070	1.6909	2.0322	2.4411	2.7284
35	0.6816	1.3062	1.6896	2.0301	2.4377	2.7238
36	0.6814	1.3055	1.6883	2.0281	2.4345	2.7195
37	0.6812	1.3049	1.6871	2.0262	2.4314	2.7154
38	0.6810	1.3042	1.6860	2.0244	2.4286	2.7116
39	0.6808	1.3036	1.6849	2.0227	2.4258	2.7079
40	0.6807	1.3031	1.6839	2.0211	2.4233	2.7045
41	0.6805	1.3025	1.6829	2.0195	2.4208	2.7012
42	0.6804	1.3020	1.6820	2.0181	2.4185	2.6981
43	0.6802	1.3016	1.6811	2.0167	2.4163	2.6951
44	0.6801	1.3011	1.6802	2.0154	2.4141	2.6923
45	0.6800	1.3007	1.6794	2.0141	2.4121	2.6896
8	0.6745	1.2816	1.6449	1.9600	2.3263	2.5758

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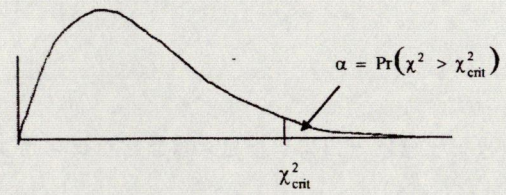
TABLE 3: CHI-SQUARED DISTRIBUTION: CRITICAL VALUES

For a particular number of degrees of freedom ν, each entry represents the value of χ^2_ν corresponding to a specified upper tail area a.



	Upper Tail Areas, a										
ν	0.995	0.99	0.975	0.95	0.99	0.1	0.05	0.025	0.01	0.005	ν
1	0.000039	0.000157	0.000982	0.003932	0.000157	2.70554	3.84146	5.02390	6.63489	7.87940	1
2	0.010025	0.020100	0.050636	0.102586	0.020100	4.60518	5.99148	7.37778	9.21035	10.59653	2
3	0.071723	0.114832	0.215795	0.351846	0.114832	6.25139	7.81472	9.34840	11.34488	12.83807	3
4	0.20698	0.29711	0.48442	0.71072	0.29711	7.77943	9.48773	11.14326	13.27670	14.86017	4
5	0.41175	0.55430	0.83121	1.14548	0.55430	9.23635	11.07048	12.83249	15.08632	16.74965	5
6	0.67573	0.87208	1.23734	1.63538	0.87208	10.64464	12.59158	14.44935	16.81187	18.54751	6
7	0.98925	1.23903	1.68986	2.16735	1.23903	12.01703	14.06713	16.01277	18.47532	20.27774	7
8	1.34440	1.64651	2.17972	2.73263	1.64651	13.36156	15.50731	17.53454	20.09016	21.95486	8
9	1.73491	2.08789	2.70039	3.32512	2.08789	14.68366	16.91896	19.02278	21.66605	23.58927	9
10	2.15585	2.55820	3.24696	3.94030	2.55820	15.98717	18.30703	20.48320	23.20929	25.18805	10
11	2.60320	3.05350	3.81574	4.57481	3.05350	17.27501	19.67515	21.92002	24.72502	26.75686	11
12	3.07379	3.57055	4.40378	5.22603	3.57055	18.54934	21.02606	23.33666	26.21696	28.29966	12
13	3.56504	4.10690	5.00874	5.89186	4.10690	19.81193	22.36203	24.73558	27.68818	29.81932	13
14	4.07466	4.66042	5.62872	6.57063	4.66042	21.06414	23.68478	26.11893	29.14116	31.31943	14
15	4.60087	5.22936	6.26212	7.26093	5.22936	22.30712	24.99580	27.48836	30.57795	32.80149	15
16	5.14216	5.81220	6.90766	7.96164	5.81220	23.54182	26.29622	28.84532	31.99986	34.26705	16
17	5.69727	6.40774	7.56418	8.67175	6.40774	24.76903	27.58710	30.19098	33.40872	35.71838	17
18	6.26477	7.01490	8.23074	9.39045	7.01490	25.98942	28.86932	31.52641	34.80524	37.15639	18
19	6.84392	7.63270	8.90651	10.11701	7.63270	27.20356	30.14351	32.85234	36.19077	38.58212	19
20	7.43381	8.26037	9.59077	10.85080	8.26037	28.41197	31.41042	34.16958	37.56627	39.99686	20
21	8.03360	8.89717	10.28291	11.59132	8.89717	29.61509	32.67056	35.47886	38.93223	41.40094	21
22	8.64268	9.54249	10.98233	12.33801	9.54249	30.81329	33.92446	36.78068	40.28945	42.79566	22
23	9.26038	10.19569	11.68853	13.09051	10.19569	32.00689	35.17246	38.07561	41.63833	44.18139	23
24	9.88620	10.85635	12.40115	13.84842	10.85635	33.19624	36.41503	39.36406	42.97978	45.55836	24
25	10.51965	11.52395	13.11971	14.61140	11.52395	34.38158	37.65249	40.64650	44.31401	46.92797	25
26	11.16022	12.19818	13.84388	15.37916	12.19818	35.56316	38.88513	41.92314	45.64164	48.28978	26
27	11.80765	12.87847	14.57337	16.15139	12.87847	36.74123	40.11327	43.19452	46.96284	49.64504	27
28	12.46128	13.56467	15.30785	16.92788	13.56467	37.91591	41.33715	44.46079	48.27817	50.99356	28
29	13.12107	14.25641	16.04705	17.70838	14.25641	39.08748	42.55695	45.72228	49.58783	52.33550	29
30	13.78668	14.95346	16.79076	18.49267	14.95346	40.25602	43.77295	46.97922	50.89218	53.67187	30
40	20.70658	22.16420	24.43306	26.50930	22.16420	51.80504	55.75849	59.34168	63.69077	66.76605	40
50	27.99082	29.70673	32.35738	34.76424	29.70673	63.16711	67.50481	71.42019	76.15380	79.48984	50
60	35.53440	37.48480	40.48171	43.18797	37.48480	74.39700	79.08195	83.29771	88.37943	91.95181	60
70	43.27531	45.44170	48.75754	51.73926	45.44170	85.5270	90.5313	95.0231	100.4251	104.2148	70
80	51.17193	53.53998	57.15315	60.39146	53.53998	96.5782	101.8795	106.6285	112.3288	116.3209	80
90	59.19633	61.75402	65.64659	69.12602	61.75402	107.5650	113.1452	118.1359	124.1162	128.2987	90
100	67.32753	70.06500	74.22188	77.92944	70.06500	118.4980	124.3421	129.5613	135.8069	140.1697	100

接下頁

國立臺北大學 112 學年度碩士班一般入學考試試題

系（所）組別：經濟學系

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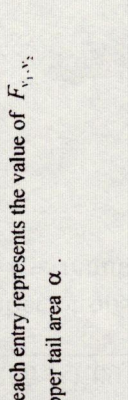
TABLE 4: F_{ν_1,ν_2} **DISTRIBUTION:** $\alpha = 0.05$

CRITICAL VALUES

For a particular pair of degrees of freedom, ν_1 : numerator and ν_2 : denominator, each entry represents the value of F_{ν_1,ν_2} corresponding to the upper tail area α .



ν_2	ν_1 1	2	3	4	5	6	7	8	9	10	12	15	20	24	30	40	60	120	∞	ν_2
1	161.45	199.50	215.71	224.58	230.16	233.99	236.77	238.88	240.54	241.88	243.90	245.95	248.02	249.05	250.10	251.14	252.20	253.25	254.32	1
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38	19.40	19.41	19.43	19.45	19.45	19.46	19.47	19.48	19.49	19.50	2
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.74	8.70	8.66	8.64	8.62	8.59	8.57	8.55	8.53	3
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.96	5.91	5.86	5.80	5.77	5.75	5.72	5.69	5.66	5.63	4
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74	4.68	4.62	4.56	4.53	4.50	4.46	4.43	4.40	4.37	5
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.00	3.94	3.87	3.84	3.81	3.77	3.74	3.70	3.67	6
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.57	3.51	3.44	3.41	3.38	3.34	3.30	3.27	3.23	7
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35	3.28	3.22	3.15	3.12	3.08	3.04	3.01	2.97	2.93	8
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.07	3.01	2.94	2.90	2.86	2.83	2.79	2.75	2.71	9
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.91	2.85	2.77	2.74	2.70	2.66	2.62	2.58	2.54	10
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.85	2.79	2.72	2.65	2.61	2.57	2.53	2.49	2.45	2.40	11
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75	2.69	2.62	2.54	2.51	2.47	2.43	2.38	2.34	2.30	12
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.60	2.53	2.46	2.42	2.38	2.34	2.30	2.25	2.21	13
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.53	2.46	2.39	2.35	2.31	2.27	2.22	2.18	2.13	14
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54	2.48	2.40	2.33	2.29	2.25	2.20	2.16	2.11	2.07	15
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.42	2.35	2.28	2.24	2.19	2.15	2.11	2.06	2.01	16
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.45	2.38	2.31	2.23	2.19	2.15	2.10	2.06	2.01	1.96	17
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.34	2.27	2.19	2.15	2.11	2.06	2.02	1.97	1.92	18
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38	2.31	2.23	2.16	2.11	2.07	2.03	1.98	1.93	1.88	19
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.28	2.20	2.12	2.08	2.04	1.99	1.95	1.90	1.84	20
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.32	2.25	2.18	2.10	2.05	2.01	1.96	1.92	1.87	1.81	21
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30	2.23	2.15	2.07	2.03	1.98	1.94	1.89	1.84	1.78	22
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.27	2.20	2.13	2.05	2.01	1.96	1.91	1.86	1.81	1.76	23
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.25	2.18	2.11	2.03	1.98	1.94	1.89	1.84	1.79	1.73	24
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.24	2.16	2.09	2.01	1.96	1.92	1.87	1.82	1.77	1.71	25
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27	2.22	2.15	2.07	1.99	1.95	1.90	1.85	1.80	1.75	1.69	26
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25	2.20	2.13	2.06	1.97	1.93	1.88	1.84	1.79	1.73	1.67	27
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24	2.19	2.12	2.04	1.96	1.91	1.87	1.82	1.77	1.71	1.65	28
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22	2.18	2.10	2.03	1.94	1.90	1.85	1.81	1.75	1.70	1.64	29
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.16	2.09	2.01	1.93	1.89	1.84	1.79	1.74	1.68	1.62	30
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12	2.08	2.00	1.92	1.84	1.79	1.74	1.69	1.64	1.58	1.51	40
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04	1.99	1.92	1.84	1.75	1.70	1.65	1.59	1.53	1.47	1.39	60
120	3.92	3.07	2.68	2.45	2.29	2.18	2.09	2.02	1.96	1.91	1.83	1.75	1.66	1.61	1.55	1.50	1.43	1.35	1.25	120
∞	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88	1.83	1.75	1.67	1.57	1.52	1.46	1.39	1.32	1.22	1.00	∞

試題隨卷繳交

接背面

國立臺北大學112學年度碩士班一般入學考試試題

系（所）組別：經濟學系

科　　目：統計學

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TABLE 5: DURBIN-WATSON STATISTIC
Bounds for critical values, d_L and d_U : $\alpha = 0.05$

	$k'=1$		$k'=2$		$k'=3$		$k'=4$		$k'=5$		$k'=6$		$k'=7$	
n	d_L	d_U	d_L	d_U	d_L	d_U	d_L	d_U	d_L	d_U	d_L	d_U	d_L	d_U
15	1.08	1.36	0.95	1.54	0.81	1.75	0.69	1.98	0.56	2.22	0.45	2.47	0.34	2.73
16	1.11	1.37	0.98	1.54	0.86	1.73	0.73	1.94	0.61	2.16	0.50	2.39	0.40	2.62
17	1.13	1.38	1.02	1.54	0.90	1.71	0.78	1.90	0.66	2.10	0.55	2.32	0.45	2.54
18	1.16	1.39	1.05	1.54	0.93	1.70	0.82	1.87	0.71	2.06	0.60	2.26	0.50	2.46
19	1.18	1.40	1.07	1.54	0.97	1.69	0.86	1.85	0.75	2.02	0.65	2.21	0.55	2.40
20	1.20	1.41	1.10	1.54	1.00	1.68	0.89	1.83	0.79	1.99	0.69	2.16	0.59	2.34
21	1.22	1.42	1.12	1.54	1.03	1.67	0.93	1.81	0.83	1.96	0.73	2.12	0.64	2.29
22	1.24	1.43	1.15	1.54	1.05	1.66	0.96	1.80	0.86	1.94	0.77	2.09	0.68	2.25
23	1.26	1.44	1.17	1.54	1.08	1.66	0.99	1.79	0.89	1.92	0.80	2.06	0.71	2.21
24	1.27	1.45	1.19	1.55	1.10	1.66	1.01	1.78	0.92	1.90	0.84	2.04	0.75	2.17
25	1.29	1.45	1.21	1.55	1.12	1.65	1.04	1.77	0.95	1.89	0.87	2.01	0.78	2.14
26	1.30	1.46	1.22	1.55	1.14	1.65	1.06	1.76	0.98	1.87	0.90	1.99	0.82	2.12
27	1.32	1.47	1.24	1.56	1.16	1.65	1.08	1.75	1.00	1.86	0.92	1.97	0.85	2.09
28	1.33	1.48	1.26	1.56	1.18	1.65	1.10	1.75	1.03	1.85	0.95	1.96	0.87	2.07
29	1.34	1.48	1.27	1.56	1.20	1.65	1.12	1.74	1.05	1.84	0.97	1.94	0.90	2.05
30	1.35	1.49	1.28	1.57	1.21	1.65	1.14	1.74	1.07	1.83	1.00	1.93	0.93	2.03
31	1.36	1.50	1.30	1.57	1.23	1.65	1.16	1.74	1.09	1.83	1.02	1.92	0.95	2.02
32	1.37	1.50	1.31	1.57	1.24	1.65	1.18	1.73	1.11	1.82	1.04	1.91	0.97	2.00
33	1.38	1.51	1.32	1.58	1.26	1.65	1.19	1.73	1.13	1.81	1.06	1.90	0.99	1.99
34	1.39	1.51	1.33	1.58	1.27	1.65	1.21	1.73	1.14	1.81	1.08	1.89	1.01	1.98
35	1.40	1.52	1.34	1.58	1.28	1.65	1.22	1.73	1.16	1.80	1.10	1.88	1.03	1.97
36	1.41	1.52	1.35	1.59	1.30	1.65	1.24	1.72	1.18	1.80	1.11	1.88	1.05	1.96
37	1.42	1.53	1.36	1.59	1.31	1.66	1.25	1.72	1.19	1.79	1.13	1.87	1.07	1.95
38	1.43	1.53	1.37	1.59	1.32	1.66	1.26	1.72	1.20	1.79	1.15	1.86	1.09	1.94
39	1.43	1.54	1.38	1.60	1.33	1.66	1.27	1.72	1.22	1.79	1.16	1.86	1.10	1.93
40	1.44	1.54	1.39	1.60	1.34	1.66	1.28	1.72	1.23	1.79	1.18	1.85	1.12	1.92
45	1.48	1.57	1.43	1.61	1.38	1.67	1.34	1.72	1.29	1.78	1.24	1.83	1.19	1.90
50	1.50	1.58	1.46	1.63	1.42	1.67	1.38	1.72	1.33	1.77	1.29	1.82	1.25	1.88
55	1.53	1.60	1.49	1.64	1.45	1.68	1.41	1.72	1.37	1.77	1.33	1.81	1.29	1.86
60	1.55	1.62	1.51	1.65	1.48	1.69	1.44	1.73	1.41	1.77	1.37	1.81	1.33	1.85
65	1.57	1.63	1.54	1.66	1.50	1.70	1.47	1.73	1.44	1.77	1.40	1.80	1.37	1.84
70	1.58	1.64	1.55	1.67	1.52	1.70	1.49	1.74	1.46	1.77	1.43	1.80	1.40	1.84
75	1.60	1.65	1.57	1.68	1.54	1.71	1.52	1.74	1.49	1.77	1.46	1.80	1.43	1.83
80	1.61	1.66	1.59	1.69	1.56	1.72	1.53	1.74	1.51	1.77	1.48	1.80	1.45	1.83
85	1.62	1.67	1.60	1.70	1.58	1.72	1.55	1.75	1.53	1.77	1.50	1.80	1.47	1.83
90	1.63	1.68	1.61	1.70	1.59	1.73	1.57	1.75	1.54	1.78	1.52	1.80	1.49	1.83
95	1.64	1.69	1.62	1.71	1.60	1.73	1.58	1.75	1.56	1.78	1.53	1.80	1.51	1.83
100	1.65	1.69	1.63	1.72	1.61	1.74	1.59	1.76	1.57	1.78	1.55	1.80	1.53	1.83

n = number of observations.
$k' = k - 1$ = number of explanatory variables excluding the constant.

試題隨卷繳交