

國立臺北大學 107 學年度碩士班一般入學考試試題

系（所）組別：企業管理學系甲組
科 目：統計學

第 1 頁 共 5 頁
☐可 ☒不可使用計算機

1. (20%) A survey of 36 randomly selected book owners showed that the purchase price has a mean of NT 416 with a sample standard deviation of NT 180.
- (a) Compute 95 percent confidence interval for mean.
- (b) How large a sample is needed to estimate the population mean within NT 10 ?
2. (10%) According to historical data, the probability of one disaster for every year is 10 percent. What is the probability less than two disasters in the next 5 years?
3. (20%) We have 100 samples from a population with normal distribution and population variance = 36. The hypotheses are $H_0: \mu \leq 70$, $H_1: \mu > 70$.
- (a) If the mean of sample is less than or equal to 71.5, accept H_0 ; If the mean of sample is greater than 71.5, reject H_0 . Please compute Type I error.
- (b) Follow (a), The mean of population is 72.5. Please compute Type II error.
4. 某市調人員隨機調查 10 位消費者對於市場上五種主要品牌(A, B, C, D, E)的評價，依序從最高到最低 1-5 排序的結果彙整如下表：

No.	A	B	C	D	E
1	5	2	3	4	1
2	2	3	4	5	1
3	3	2	5	4	1
4	2	1	3	5	4
5	1	3	4	5	2
6	3	1	4	5	2
7	3	1	2	5	4
8	3	2	4	5	1
9	5	3	4	2	1
10	3	4	1	2	5

請問該市調人員應該使用何種方法如何檢定消費者對這五種品牌的評價是否一致 (5%)? 為什麼該使用這個方法 (10%)? 檢定結果為何 (10%)? ($\alpha = 0.05$)

5. 某研究生建立了一個線性迴歸模式: $Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \varepsilon_i$, β_0 、 β_1 、 β_2 、 β_3 分別是截距項與解釋變數(x1-x3)的係數, ε_i 是隨機誤差項, $i = 1, 2, \dots, n$, ε_i 滿足迴歸模式基本假設。該研究生想藉由變異數膨脹因子(variance inflation factor, VIF)評估多重共線(multicollinearity)的問題, 請問該生要如何計算 VIF 值(15%)? 為什麼應該評估這個問題 (10%)?

試題隨卷繳交

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Student's *t* Distribution

one tail α								
	0.0005	0.001	0.005	0.01	0.02	0.025	0.05	0.1
two tails α								
DF	0.001	0.002	0.01	0.02	0.04	0.05	0.1	0.2
1	636.6192	318.3088	63.6567	31.8205	15.8945	12.7062	6.3138	3.0777
2	31.5991	22.3271	9.9248	6.9646	4.8487	4.3027	2.9200	1.8856
3	12.9240	10.2145	5.8409	4.5407	3.4819	3.1824	2.3534	1.6377
4	8.6103	7.1732	4.6041	3.7469	2.9985	2.7764	2.1318	1.5332
5	6.8688	5.8934	4.0321	3.3649	2.7565	2.5706	2.0150	1.4759
6	5.9588	5.2076	3.7074	3.1427	2.6122	2.4469	1.9432	1.4398
7	5.4079	4.7853	3.4995	2.9980	2.5168	2.3646	1.8946	1.4149
8	5.0413	4.5008	3.3554	2.8965	2.4490	2.3060	1.8595	1.3968
9	4.7809	4.2968	3.2498	2.8214	2.3984	2.2622	1.8331	1.3830
10	4.5869	4.1437	3.1693	2.7638	2.3593	2.2281	1.8125	1.3722
11	4.4370	4.0247	3.1058	2.7181	2.3281	2.2010	1.7959	1.3634
12	4.3178	3.9296	3.0545	2.6810	2.3027	2.1788	1.7823	1.3562
13	4.2208	3.8520	3.0123	2.6503	2.2816	2.1604	1.7709	1.3502
14	4.1405	3.7874	2.9768	2.6245	2.2638	2.1448	1.7613	1.3450
15	4.0728	3.7328	2.9467	2.6025	2.2485	2.1314	1.7531	1.3406
16	4.0150	3.6862	2.9208	2.5835	2.2354	2.1199	1.7459	1.3368
17	3.9651	3.6458	2.8982	2.5669	2.2238	2.1098	1.7396	1.3334
18	3.9216	3.6105	2.8784	2.5524	2.2137	2.1009	1.7341	1.3304
19	3.8834	3.5794	2.8609	2.5395	2.2047	2.0930	1.7291	1.3277
20	3.8495	3.5518	2.8453	2.5280	2.1967	2.0860	1.7247	1.3253
21	3.8193	3.5272	2.8314	2.5176	2.1894	2.0796	1.7207	1.3232
22	3.7921	3.5050	2.8188	2.5083	2.1829	2.0739	1.7171	1.3212
23	3.7676	3.4850	2.8073	2.4999	2.1770	2.0687	1.7139	1.3195
24	3.7454	3.4668	2.7969	2.4922	2.1715	2.0639	1.7109	1.3178
25	3.7251	3.4502	2.7874	2.4851	2.1666	2.0595	1.7081	1.3163
26	3.7066	3.4350	2.7787	2.4786	2.1620	2.0555	1.7056	1.3150
27	3.6896	3.4210	2.7707	2.4727	2.1578	2.0518	1.7033	1.3137
28	3.6739	3.4082	2.7633	2.4671	2.1539	2.0484	1.7011	1.3125
29	3.6594	3.3962	2.7564	2.4620	2.1503	2.0452	1.6991	1.3114
30	3.6460	3.3852	2.7500	2.4573	2.1470	2.0423	1.6973	1.3104
31	3.6335	3.3749	2.7440	2.4528	2.1438	2.0395	1.6955	1.3095
32	3.6218	3.3653	2.7385	2.4487	2.1409	2.0369	1.6939	1.3086
33	3.6109	3.3563	2.7333	2.4448	2.1382	2.0345	1.6924	1.3077
34	3.6007	3.3479	2.7284	2.4411	2.1356	2.0322	1.6909	1.3070
35	3.5911	3.3400	2.7238	2.4377	2.1332	2.0301	1.6896	1.3062

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36	3.5821	3.3326	2.7195	2.4345	2.1309	2.0281	1.6883	1.3055
37	3.5737	3.3256	2.7154	2.4314	2.1287	2.0262	1.6871	1.3049
38	3.5657	3.3190	2.7116	2.4286	2.1267	2.0244	1.6860	1.3042
39	3.5581	3.3128	2.7079	2.4258	2.1247	2.0227	1.6849	1.3036
40	3.5510	3.3069	2.7045	2.4233	2.1229	2.0211	1.6839	1.3031
41	3.5442	3.3013	2.7012	2.4208	2.1212	2.0195	1.6829	1.3025
42	3.5377	3.2960	2.6981	2.4185	2.1195	2.0181	1.6820	1.3020
43	3.5316	3.2909	2.6951	2.4163	2.1179	2.0167	1.6811	1.3016
44	3.5258	3.2861	2.6923	2.4141	2.1164	2.0154	1.6802	1.3011
45	3.5203	3.2815	2.6896	2.4121	2.1150	2.0141	1.6794	1.3006
46	3.5150	3.2771	2.6870	2.4102	2.1136	2.0129	1.6787	1.3002
47	3.5099	3.2729	2.6846	2.4083	2.1123	2.0117	1.6779	1.2998
48	3.5051	3.2689	2.6822	2.4066	2.1111	2.0106	1.6772	1.2994
49	3.5004	3.2651	2.6800	2.4049	2.1099	2.0096	1.6766	1.2991
50	3.4960	3.2614	2.6778	2.4033	2.1087	2.0086	1.6759	1.2987
51	3.4918	3.2579	2.6757	2.4017	2.1076	2.0076	1.6753	1.2984
52	3.4877	3.2545	2.6737	2.4002	2.1066	2.0066	1.6747	1.2980
53	3.4838	3.2513	2.6718	2.3988	2.1055	2.0057	1.6741	1.2977
54	3.4800	3.2481	2.6700	2.3974	2.1046	2.0049	1.6736	1.2974
55	3.4764	3.2451	2.6682	2.3961	2.1036	2.0040	1.6730	1.2971
56	3.4729	3.2423	2.6665	2.3948	2.1027	2.0032	1.6725	1.2969
57	3.4696	3.2395	2.6649	2.3936	2.1018	2.0025	1.6720	1.2966
58	3.4663	3.2368	2.6633	2.3924	2.1010	2.0017	1.6716	1.2963
59	3.4632	3.2342	2.6618	2.3912	2.1002	2.0010	1.6711	1.2961
60	3.4602	3.2317	2.6603	2.3901	2.0994	2.0003	1.6706	1.2958
70	3.4350	3.2108	2.6479	2.3808	2.0927	1.9944	1.6669	1.2938
80	3.4163	3.1953	2.6387	2.3739	2.0878	1.9901	1.6641	1.2922
90	3.4019	3.1833	2.6316	2.3685	2.0839	1.9867	1.6620	1.2910
100	3.3905	3.1737	2.6259	2.3642	2.0809	1.9840	1.6602	1.2901

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Z Distribution

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641
0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451
0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183
2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143
2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110
2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084
2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064
2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048
2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036
2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026
2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019
2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014
3.0	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011	0.0010	0.0010

試題隨卷繳交

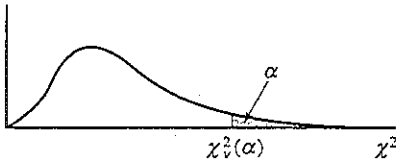
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TABLE 3 χ^2 DISTRIBUTION PERCENTAGE POINTS



d.f. ν	α								
	.990	.950	.900	.500	.100	.050	.025	.010	.005
1	.0002	.004	.02	.45	2.71	3.84	5.02	6.63	7.88
2	.02	.10	.21	1.39	4.61	5.99	7.38	9.21	10.60
3	.11	.35	.58	2.37	6.25	7.81	9.35	11.34	12.84
4	.30	.71	1.06	3.36	7.78	9.49	11.14	13.28	14.86
5	.55	1.15	1.61	4.35	9.24	11.07	12.83	15.09	16.75
6	.87	1.64	2.20	5.35	10.64	12.59	14.45	16.81	18.55
7	1.24	2.17	2.83	6.35	12.02	14.07	16.01	18.48	20.28
8	1.65	2.73	3.49	7.34	13.36	15.51	17.53	20.09	21.95
9	2.09	3.33	4.17	8.34	14.68	16.92	19.02	21.67	23.59
10	2.56	3.94	4.87	9.34	15.99	18.31	20.48	23.21	25.19
11	3.05	4.57	5.58	10.34	17.28	19.68	21.92	24.72	26.76
12	3.57	5.23	6.30	11.34	18.55	21.03	23.34	26.22	28.30
13	4.11	5.89	7.04	12.34	19.81	22.36	24.74	27.69	29.82
14	4.66	6.57	7.79	13.34	21.06	23.68	26.12	29.14	31.32
15	5.23	7.26	8.55	14.34	22.31	25.00	27.49	30.58	32.80
16	5.81	7.96	9.31	15.34	23.54	26.30	28.85	32.00	34.27
17	6.41	8.67	10.09	16.34	24.77	27.59	30.19	33.41	35.72
18	7.01	9.39	10.86	17.34	25.99	28.87	31.53	34.81	37.16
19	7.63	10.12	11.65	18.34	27.20	30.14	32.85	36.19	38.58
20	8.26	10.85	12.44	19.34	28.41	31.41	34.17	37.57	40.00
21	8.90	11.59	13.24	20.34	29.62	32.67	35.48	38.93	41.40
22	9.54	12.34	14.04	21.34	30.81	33.92	36.78	40.29	42.80
23	10.20	13.09	14.85	22.34	32.01	35.17	38.08	41.64	44.18
24	10.86	13.85	15.66	23.34	33.20	36.42	39.36	42.98	45.56
25	11.52	14.61	16.47	24.34	34.38	37.65	40.65	44.31	46.93
26	12.20	15.38	17.29	25.34	35.56	38.89	41.92	45.64	48.29
27	12.88	16.15	18.11	26.34	36.74	40.11	43.19	46.96	49.64
28	13.56	16.93	18.94	27.34	37.92	41.34	44.46	48.28	50.99
29	14.26	17.71	19.77	28.34	39.09	42.56	45.72	49.59	52.34
30	14.95	18.49	20.60	29.34	40.26	43.77	46.98	50.89	53.67
40	22.16	26.51	29.05	39.34	51.81	55.76	59.34	63.69	66.77
50	29.71	34.76	37.69	49.33	63.17	67.50	71.42	76.15	79.49
60	37.48	43.19	46.46	59.33	74.40	79.08	83.30	88.38	91.95
70	45.44	51.74	55.33	69.33	85.53	90.53	95.02	100.43	104.21
80	53.54	60.39	64.28	79.33	96.58	101.88	106.63	112.33	116.32
90	61.75	69.13	73.29	89.33	107.57	113.15	118.14	124.12	128.30
100	70.06	77.93	82.36	99.33	118.50	124.34	129.56	135.81	140.17

試題隨卷繳交