國立嘉義大學99學年度
資訊管理學系碩士班（甲組）招生考試試題

科目：統計學

1. Medical tests were conducted to learn about drug-resistant tuberculosis. Of 142 cases tested in New Jersey, nine were found to be drug-resistant. Of 268 cases tested in Texas, five were found to be drug-resistant. Do these data suggest a statistically significant difference between the proportions of drug-resistant cases in the two states? Use a .02 level of significance. What is the p-value and what is your conclusion? (25%)

2. A special industrial battery must have a life of at least 400 hours. A hypothesis test is to be conducted with a .02 level of significance. If the batteries from a particular production run have an actual mean use life of 385 hours, the production manager wants a sampling procedure that only 10% of the time would erroneously show that the batch is acceptable. What sample size is recommended for the hypothesis test? Use 30 hours as an estimate of the population standard deviation. (25%)

3. A factorial experiment was designed to test for any significant differences in the time needed to perform English to foreign language translations with two computerized language translators. Because the type of language translated was also considered a significant factor, translations were made with both systems for three different languages: Spanish, French, and German. Use the following data for translation time in hours. Test for any significant differences due to language translator, type of language, and interaction. Use α= 0.05. (25%)

	Language		
	Spanish	French	German
System 1	8	10	12
	12	14	16
System 2	6	14	16
	10	16	22

4. A partial computer output from a regression analysis follows. (25%)

The regression equation is
Y = 8.103 + 7.602 X1 + 3.111 X2

Predictor	Coef	SE Coef	T
Constant	_____	2.667	_____
X1	_____	2.105	_____
X2	_____	0.613	_____

S = 3.335 R-sq = 92.3% R-sq(adj) = _____%

Analysis of Variance

SOURCE	DF	SS	MS	F
Regression	_____	1612	_____	_____
Residual Error	12	_____	_____	
Total	_____	_____		

a. Compute the appropriate t-ratios.
b. Test for the significance of β_1 and β_2 at $\alpha = 0.05$. ($t_{(0.05, 12)}=1.782$)
c. Compute the entries in the DF, SS, and MS columns.
d. Compute R^2_a.

Appendix 1：Z Distribution Table

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1.0	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
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
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

Appendix 2：F Distribution Table: $F_{(0.05, df1, df2)}$

df2/df1	1	2	3	4
1	161.4476	199.5000	215.7073	224.5832
2	18.5128	19.0000	19.1643	19.2468
3	10.1280	9.5521	9.2766	9.1172
4	7.7086	6.9443	6.5914	6.3882
5	6.6079	5.7861	5.4095	5.1922
6	5.9874	5.1433	4.7571	4.5337
7	5.5914	4.7374	4.3468	4.1203
8	5.3177	4.4590	4.0662	3.8379
9	5.1174	4.2565	3.8625	3.6331
10	4.9646	4.1028	3.7083	3.4780