私立臺北醫學院 90 學年度第 1 學期 期中 期末 考試 命(試)題紙

系級	科目	授課教師	考試日期	學號	姓名
四二	生物統計學	蔡篤榮	91年1月17日第1節		

※①請注意本試題共 3 張。如發現頁數不足及空白頁或缺印，應當場請求補齊，否則缺少部份概以零分計。
②每張試題卷務必填寫(學號)、(姓名)。 <答案公式反面皆有>

1. Definition:
   (1) p-value

   (2) α error

   (3) Power of testing

   (4) 95% C.I.

   (5) hypothesis testing

2. In a country, the number of subjects who died from AIDS in last year is 100, what is the 95% C.I. of the mean value per year?

3. An allergy research team conducted a study in which two groups of subjects were used. As part of the research, blood eosinophil determinations were made on each subject with the following results: Let $\alpha = .05$.

Group	Sample size	Eosinophil value (no./mm^3) $\bar{x}$	S
A	11	600	25
B	16	700	20

Do these data provide sufficient evidence to indicate that:
(1) The population variances are different?

H_0: _____
H_1: _____

(2) The population means are different?

H_0: _____
H_1: _____

私立臺北醫學院 90 學年度第 1 學期 期中 (期末) 考試 命(試)題紙

系級	科目	授課教師	考試日期	學號	姓名
公二	生物統計學	黃繡紫	91年1月17日第1節		

※①請注意本試題共 3 張。如發現頁數不足及空白頁或缺印，應當場請求補齊，否則缺少部份概以零分計。
②每張試題卷務必填寫(學號)、(姓名)。

4. Researchers wish to know if urban and rural adult residents of a developing country differ with respect to the prevalence of blindness. A survey revealed the following information:

Group	Number blind	Number non-blind	Number in sample
Rural	24	176	200
Urban	15	85	100

By χ^2 test, these data provide sufficient evidence to indicate a difference in the prevalence of blindness in the two populations? Let $\alpha = .05$.

5. Among the measurements taken on each of 37 subjects were deep abdominal AT obtained by CT and waist circumference. We can predict and estimate deep abdominal AT [Y; 11.4~127.0] from knowledge of waist circumference [X; 63.5~102.0cm] with a regression as $\hat{y} = -187.86 + 2.99x$ and the ANOVA table shown as following. Please answer the following question.

(1) How explain the coefficient of regression?

(2) Fill blanks in following table.

Source of variance	SS	df	MS	F	p-value
Regression	20784.5	(dfr)	(MSr)	(F)	$5.2X10^{-11}$
Error	(SSe)	(dfe)	(Mse)		
Total	29162.2	36			

SSe=(_____)
dfr=(_____)
dfe=(_____)
MSr=(_____)
MSe=(_____)
F =(_____)

[Calculation]:

(3) Calculate the coefficient of determinant (r^2).

(4) State which is meant of r^2?

(5) How large the critical value of F ?
Answer : (_____)

(6) What is your conclusion?

Tables

$F_{.95}$ table

df2 \ df1	1	2	3	4	5	10	15	35	60	120	∞
1	161.45	199.50	215.71	224.58	230.16	241.88	245.95	250.69	252.20	253.25	254.32
2	18.51	19.00	19.16	19.25	19.30	19.40	19.43	19.47	19.48	19.49	19.50
3	10.13	9.55	9.28	9.12	9.01	8.79	8.70	8.60	8.57	8.55	8.53
4	7.71	6.94	6.59	6.39	6.26	5.96	5.86	5.73	5.69	5.66	5.63
5	6.61	5.79	5.41	5.19	5.05	4.74	4.62	4.48	4.43	4.40	4.36
10	4.96	4.10	3.71	3.48	3.33	2.98	2.85	2.68	2.62	2.58	3.67
15	4.54	3.68	3.29	3.06	2.90	2.54	2.40	2.22	2.16	2.11	3.23
35	4.12	3.27	2.87	2.64	2.49	2.11	1.96	1.76	1.68	1.62	2.93
60	4.00	3.15	2.76	2.53	2.37	1.99	1.84	1.62	1.53	1.47	2.71
120	3.92	3.07	2.68	2.45	2.29	1.91	1.75	1.52	1.43	1.35	2.54
∞	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88	1.83	1.00

$F_{.975}$ table

df2 \ df1	1	2	3	4	5	10	15	30	60	120	∞
1	647.79	799.48	864.15	899.60	921.83	968.63	984.87	1001.40	1009.79	1014.04	1018.26
2	38.51	39.00	39.17	39.25	39.30	39.40	39.43	39.46	39.48	39.49	39.50
3	17.44	16.04	15.44	15.10	14.88	14.42	14.25	14.08	13.99	13.95	13.90
4	12.22	10.65	9.98	9.60	9.36	8.84	8.66	8.46	8.36	8.31	8.26
5	10.01	8.43	7.76	7.39	17.15	6.62	6.43	6.23	6.12	6.07	6.02
10	6.94	5.46	4.83	4.47	4.24	3.72	3.52	3.31	3.20	3.14	3.08
15	6.20	4.77	4.15	3.80	3.58	3.06	2.86	2.64	2.52	2.46	2.40
30	5.57	4.18	3.59	3.25	3.03	2.51	2.31	2.07	1.94	1.87	1.79
60	5.29	3.93	3.34	3.01	2.79	2.27	2.06	1.82	1.67	1.58	1.48
120	5.15	3.80	3.23	2.89	2.67	2.16	1.94	1.69	1.53	1.43	1.31
∞	5.02	3.69	3.12	2.79	2.57	2.05	1.83	1.57	1.39	1.27	1.00

t table

df	$t_{.90}$	$t_{.95}$	$t_{.975}$	$t_{.99}$	$t_{.995}$	$t_{.999}$
1	3.08	6.31	12.71	31.82	63.66	318.29
2	1.89	2.92	4.30	6.96	9.92	22.33
3	1.64	2.35	3.18	4.54	5.84	10.21
4	1.53	2.13	2.78	3.75	4.60	7.17
5	1.48	2.02	2.57	3.36	4.03	5.89
6	1.44	1.94	2.45	3.14	3.71	5.21
7	1.41	1.89	2.36	3.00	3.50	4.79
8	1.40	1.86	2.31	2.90	3.36	4.50
9	1.38	1.83	2.26	2.82	3.25	4.30
10	1.37	1.81	2.23	2.76	3.17	4.14
15	1.34	1.75	2.13	2.60	2.95	3.73
30	1.31	1.70	2.04	2.46	2.75	3.39
120	1.29	1.66	1.98	2.36	2.62	3.16
∞	1.28	1.65	1.96	2.33	2.58	3.09

χ^2 table

df	$\chi^2_{0.025}$	$\chi^2_{0.05}$	$\chi^2_{0.95}$	$\chi^2_{0.975}$	$\chi^2_{0.99}$
1	0.00	0.00	3.84	5.02	6.63
2	0.05	0.10	5.99	7.38	9.21
3	0.22	0.35	7.81	9.35	11.34
4	0.48	0.71	9.49	11.14	13.28
5	0.83	1.15	11.07	12.83	15.09
6	1.24	1.64	12.59	14.45	16.81
7	1.69	2.17	14.07	16.01	18.48
8	2.18	2.73	15.51	17.53	20.09
9	2.70	3.33	16.92	19.02	21.67
10	3.25	3.94	18.31	20.48	23.21
15	6.26	7.26	25.00	27.49	30.58
20	9.59	10.85	31.41	34.17	37.57
30	16.79	18.49	43.77	46.98	50.89
40	24.43	26.51	55.76	59.34	63.69
60	40.48	43.19	79.08	83.30	88.38

公式：

$$t = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

$$t = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{\frac{S_p^2}{n_1} + \frac{S_p^2}{n_2}}}$$

$$S_p^2 = \frac{df_1 * S_1^2 + df_2 * S_2^2}{df_1 + df_2}$$

$$\chi^2 = \frac{(ad - bc)^2 * n}{T_1 * T_2 * T_3 * T_4}$$

$$\chi^2 = \Sigma \frac{(O_i - E_i)^2}{E_i}$$

$$F = \frac{S_1^2}{S_2^2} = \frac{MS_1}{MS_2}$$

$$F = \frac{S_b^2}{S_w^2} = \frac{MS_b}{MS_w}$$

$$F = \frac{S_r^2}{S_e^2} = \frac{MS_r}{MS_e}$$