1071BM01

國立臺北科技大學 107 學年度碩士班招生考試

系所組別：4201、4202、4203、4204 經營管理系碩士班

第一節　統計學　試題

注意事項：

1. 本試題共 20 題(第 19 題有兩小題)，每題 5 分，共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。
4. 所需統計表共 13 張，皆附在本試題之後。

一、(5%) A walk-in medical clinic believes that arrivals are uniformly distributed over weekdays (Monday through Friday). It has collected the following data based on a random sample of 100 days.

	Frequency
Mon	25
Tue	22
Wed	19
Thu	18
Fri	16
Total	100

Based on these data, conduct a goodness-of-fit test using a 0.10 level of significance. Which conclusion is correct?

(A) Arrivals are not uniformly distributed over the weekday because (test statistic) > (critical value).
(B) Arrivals are uniformly distributed over the weekday because (test statistic) > (critical value).
(C) Arrivals are not uniformly distributed over the weekday because (test statistic) < (critical value).
(D) Arrives are uniformly distributed over the weekday because (test statistic) < (critical value).
(E) None of the above

二、(5%) A company that receives the majority of its orders by telephone conducted a study to determine how long customers were willing to wait on hold before ordering a product. The length of waiting time was found to be a variable best approximated by an exponential distribution with a mean length of waiting time equal to 3 minutes. Find the waiting time at which only 10% of the customers will continue to hold.

(A) 13.8 minutes
(B) 6.9 minutes
(C) 3.3 minutes
(D) 2.3 minutes
(E) None of the above

三、(5%) If the variance of the contents of cans of orange juice is significantly more than 0.003, the manager has to order to stop the filling machine. A sample of 26 cans of orange juice showed a standard deviation of 0.06 ounce. Based on the sample and at the 0.05 level of significance, the filling machine should be

(A) stopped.
(B) kept going.
(C) upgraded.
(D) downgraded.
(E) None of the above

四、(5%) If a decision maker wishes to develop a regression model in which the University Class Standing is a categorical variable with 5 possible levels of response, then he will need to include how many dummy variables?

(A) 5
(B) 4
(C) 1
(D) 3
(E) None of the above

注意：背面尚有試題

五、(5%) Interaction exists in a multiple regression model when:

(A) one independent variable affects the relationship between another independent variable and the dependent variable.
(B) multicollinearity is present in a regression model.
(C) the regression model is overall insignificant.
(D) a polynomial model used.
(E) None of the above

六、(5%) Thirty-six of the staff of 80 teachers at a local intermediate school are certified in Cardio-Pulmonary Resuscitation (CPR). In 180 days of school, about how many days can we expect that the teacher on bus duty will likely be certified in CPR?

(A) 5 days
(B) 81 days
(C) 45 days
(D) 65 days
(E) None of the above

七、(5%) The probability that house sales will increase in the next 6 months is estimated to be 0.25. The probability that the interest rates on housing loans will go up in the same period is estimated to be 0.74. The probability that house sales or interest rates will go up during the next 6 months is estimated to be 0.89. The events increase in house sales and no increase in house sales in the next 6 months are

(A) mutually exclusive and collectively exhaustive.
(B) independent.
(C) collectively exhaustive.
(D) mutually exclusive.
(E) None of the above

八、(5%) A consulting report that was recently submitted to a company indicated that a hypothesis test for a single population variance was conducted. The report indicated that the test statistic was 34.79, the hypothesized variance was 345 and the sample variance 600. However, the report did not indicate what the sample size was. What was it?

(A) n = 100
(B) Approximately n = 18
(C) Approximately n=21
(D) Can't be determined without knowing what alpha is.
(E) None of the above

九、(5%) The U.S. Golf Association provides a number of services for its members. One of these is the evaluation of golf equipment to make sure that the equipment satisfies the rules of golf. For example, they regularly test the golf balls made by the various companies that sell balls in the United States. Recently, they undertook a study of two brands of golf balls with the objective to see whether there is a difference in the mean distance that the two golf ball brands will fly off the tee. To conduct the test, the U.S.G.A. uses a robot named "Iron Byron," which swings the club at the same speed and with the same swing pattern each time it is used. The following data reflect sample data for a random sample of balls of each brand.

Brand A:	234	236	230	227	234	233	228	229	230	238
Brand B:	240	236	241	236	239	243	230	239	243	240

Given this information, what is the test statistic for testing whether the two population variances are equal?

(A) Approximately F = 1.145
(B) t = 1.96
(C) t = -4.04
(D) t = -3.76
(E) None of the above

十、(5%) A company has 2 machines that produce widgets. An older machine produces 23% defective widgets, while the new machine produces only 8% defective widgets. In addition, the new machine produces 3 times as many widgets as the older machine does. Given a randomly chosen widget was tested and found to be defective, what is the probability it was produced by the new machine?

(A) 0.489
(B) 0.08
(C) 0.511
(D) 0.15
(E) None of the above

十一、(5%) A toll-free phone number is available from 9 A.M. to 9 P.M. for your customers to register complaints about a product purchased from your company. Past history indicates that an average of 0.8 calls is received per minute. What is the maximum number of phone calls that will be received in a one-minute period 99.99% of the time?

(A) 4
(B) 6
(C) 0
(D) 1
(E) None of the above

十二、(5%) The time between visits to a US. emergency room for a member of the general population follows an exponential distribution with a mean of 2.5 years. What proportion of the population will visit an ER next year, but not this year?

(A) 0.78
(B) 0.92
(C) 0.67
(D) 0.22
(E) None of the above

十三、(5%) Which of the following is not an indication of potential multicollinearity problems?

(A) The sign on the standard error of the estimate is positive.
(B) A sign on a regression slope coefficient is negative when the sign on the correlation coefficient was positive.
(C) The standard error of the estimate increases when a variable enters the model in the presence of other independent variables.
(D) An independent variable goes from being statistically significant to being insignificant when a new variable is added to the model.
(E) None of the above

十四、(5%) An Internet service provider is interested in testing to see if there is a difference in the mean weekly connect time for users who come into the service through a dial-up line, DSL, or cable Internet. To test this, the ISP has selected random samples from each category of user and recorded the connect time during a week period. The following data were collected:

Dial Up	DSL	Cable
19.2	40.6	39.5
17.7	40	42.3
17.2	41.5	47
18.9	30.5	45.4
26.9	46.8	41.1
22.6		43.2
31.2		39.9
		41.9
		49.3

Based upon these data and a significance level of 0.05, which of the following statements is true?

(A) The F-critical value for the test is 3.555
(B) The test statistic is approximately 43.9
(C) The null hypothesis should be rejected and conclude that the mean connect times for the three user categories are not all equal.
(D) All of the above are true.
(E) None of the above

注意：背面尚有試題

十五、(5%) A regression equation that predicts the price of homes in thousands of dollars is $\hat{y}_t = 24.6 + 0.055x_1 + 3.6x_2$, where x_2 is a dummy variable that represents whether the house in on a busy street or not. Here $x_2 = 1$ means the house is on a busy street and $x_2 = 0$ means it is not. Based on this information, which of the following statements is true?

(A) On average, homes that are on busy streets are worth $3600 less than homes that are not on busy streets.

(B) On average, homes that are on busy streets are worth $3.6 less than homes that are not on busy streets.

(C) On average, homes that are on busy streets are worth $3600 more than homes that are not on busy streets.

(D) On average, homes that are on busy streets are worth $3.6 more than homes that are not on busy streets.

(E) None of the above

十六、(5%) The editors of a national automotive magazine recently studied 30 different automobiles sold in the United States with the intent of seeing whether they could develop a multiple regression model to explain the variation in highway mileage per gallon. A number of different independent variables were collected. The following correlation matrix was developed:

	mileage, highway	Curb Weight	Cylinders	Horse Power	Torque	0 to 60 mph	Price as Tested	Displacement
mileage, highway	1.000							
Curb Weight	-0.739	1.000						
Cylinders	-0.695	0.596	1.000					
Horse Power	-0.549	0.293	0.840	1.000				
Torque	-0.679	0.502	0.932	0.931	1.000			
0 to 60 mph	0.338	0.053	-0.637	-0.860	-0.717	1.000		
Price as Tested	-0.392	-0.030	0.457	0.766	0.566	-0.819	1.000	
Displacement	-0.674	0.510	0.912	0.789	0.915	-0.555	0.350	1.000

If only one variable were to be brought into the model, which variable should it be if the goal is to explain the highest possible percentage of variation in the dependent variable?

(A) 0 to 60 mph

(B) Horsepower

(C) Curb weight

(D) Displacement

(E) None of the above

十七、(5%) A computer used by a 24-hour banking service is supposed to randomly assign each transaction to one of 5 memory locations. A check at the end of a day's transactions gave the counts shown in the table to each of the 5 memory locations, along with the number of reported errors.

Memory Location	1	2	3	4	5
Number of Transactions	82	100	74	92	102
Number of Reported Errors	11	12	6	9	10

The bank manager wanted to test whether the proportion of errors in transactions assigned to each of the 5 memory locations differ. At 1% level of significance

(A) there is sufficient evidence to conclude that the proportions of errors in transactions assigned to each of the 5 memory locations are all different.

(B) there is sufficient evidence to conclude that the proportion of errors in transactions assigned to each of the 5 memory locations are not all the same.

(C) there is insufficient evidence to conclude that the proportions of errors in transactions assigned to each of the 5 memory locations are all different.

(D) there is insufficient evidence to conclude that the proportion of errors in transactions assigned to each of the 5 memory locations are not all the same

(E) None of the above

十八、(5%) Waiters at Finegold's Restaurant and Lounge earn most of their income from tips. Each waiter is required to "tip-out" a portion of tips to the table bussers and hostesses. The manager has based the "tip-out" rate on the assumption that the mean tip is at least 15% of the customer bill. To make sure that this is the correct assumption, he has decided to conduct a test by randomly sampling 60 bills and recording the actual tips. Calculate the probability of a Type II error if the true mean is 14%. Assume that the population standard deviation is known to be 2% and that a significance level equal to 0.01 will be used to conduct the hypothesis test.

(A) 0.0041

(B) 0.1251

(C) 0.0606

(D) 0.4123

(E) None of the above

十九、Psychologists have found that people are generally reluctant to transmit bad news to their peers. This phenomenon has been termed the "MUM effect." To investigate the cause of the MUM effect, 40 undergraduates at Duke University participated in an experiment. Each subject was asked to administer an IQ test to another student and then provide the test taker with his or her percentile score. Unknown to the subject, the test taker was a bogus student who was working with the researchers. The experimenters manipulated two factors: subject visibility and success of test taker, each at two levels. Subject visibility was either visible or not visible to the test taker. Success of the test taker was either top 20% or bottom 20%. Ten subjects were randomly assigned to each of the 2 x 2 = 4 experimental conditions, then the time (in seconds) between the end of the test and the delivery of the percentile score from the subject to the test taker was measured. (This variable is called the latency to feedback.) The data were subjected to appropriate analyses with the following information:

Source	SS
Subject visibility	1380.24
Test taker success	1325.16
Interaction	3385.80
Error	11,644.00
Total	17,755.20

1. (5%) At the 0.01 level, what conclusions can you reach from the analysis?

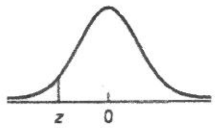
(A) At the 0.01 level, there is no evidence of interaction between subject visibility and test taker success.
(B) At the 0.01 level, subject visibility and test taker success are significant predictors of latency feedback.
(C) At the 0.01 level, the model is not useful for predicting latency to feedback.
(D) At the 0.01 level, there is evidence to indicate that subject visibility and test taker success interact.
(E) None of the above

2. (5%) In the context of this study, interpret the statement: "Subject visibilityand test taker success interact."

(A) The difference between the mean feedback time for visible and nonvisible subjects depends on the success of the test taker.
(B) The difference between the mean feedback time for test takers scoring in the top 20% and bottom 20% depends on the visibility of the subject.
(C) The relationship between feedback time and subject visibility depends on the success of the test taker.
(D) All of these are correct interpretations.
(E) None of the above

附表1

Areas under the standard normal curve

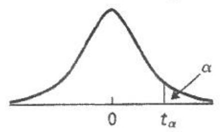


Second decimal place in z										
0.09	0.08	0.07	0.06	0.05	0.04	0.03	0.02	0.01	0.00	z
									0.0000†	−3.9
0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	−3.8
0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	−3.7
0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	−3.6
0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	−3.5
0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	−3.4
0.0003	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0005	0.0005	0.0005	−3.3
0.0005	0.0005	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.0007	−3.2
0.0007	0.0007	0.0008	0.0008	0.0008	0.0008	0.0009	0.0009	0.0009	0.0010	−3.1
0.0010	0.0010	0.0011	0.0011	0.0011	0.0012	0.0012	0.0013	0.0013	0.0013	−3.0
0.0014	0.0014	0.0015	0.0015	0.0016	0.0016	0.0017	0.0018	0.0018	0.0019	−2.9
0.0019	0.0020	0.0021	0.0021	0.0022	0.0023	0.0023	0.0024	0.0025	0.0026	−2.8
0.0026	0.0027	0.0028	0.0029	0.0030	0.0031	0.0032	0.0033	0.0034	0.0035	−2.7
0.0036	0.0037	0.0038	0.0039	0.0040	0.0041	0.0043	0.0044	0.0045	0.0047	−2.6
0.0048	0.0049	0.0051	0.0052	0.0054	0.0055	0.0057	0.0059	0.0060	0.0062	−2.5
0.0064	0.0066	0.0068	0.0069	0.0071	0.0073	0.0075	0.0078	0.0080	0.0082	−2.4
0.0084	0.0087	0.0089	0.0091	0.0094	0.0096	0.0099	0.0102	0.0104	0.0107	−2.3
0.0110	0.0113	0.0116	0.0119	0.0122	0.0125	0.0129	0.0132	0.0136	0.0139	−2.2
0.0143	0.0146	0.0150	0.0154	0.0158	0.0162	0.0166	0.0170	0.0174	0.0179	−2.1
0.0183	0.0188	0.0192	0.0197	0.0202	0.0207	0.0212	0.0217	0.0222	0.0228	−2.0
0.0233	0.0239	0.0244	0.0250	0.0256	0.0262	0.0268	0.0274	0.0281	0.0287	−1.9
0.0294	0.0301	0.0307	0.0314	0.0322	0.0329	0.0336	0.0344	0.0351	0.0359	−1.8
0.0367	0.0375	0.0384	0.0392	0.0401	0.0409	0.0418	0.0427	0.0436	0.0446	−1.7
0.0455	0.0465	0.0475	0.0485	0.0495	0.0505	0.0516	0.0526	0.0537	0.0548	−1.6
0.0559	0.0571	0.0582	0.0594	0.0606	0.0618	0.0630	0.0643	0.0655	0.0668	−1.5
0.0681	0.0694	0.0708	0.0721	0.0735	0.0749	0.0764	0.0778	0.0793	0.0808	−1.4
0.0823	0.0838	0.0853	0.0869	0.0885	0.0901	0.0918	0.0934	0.0951	0.0968	−1.3
0.0985	0.1003	0.1020	0.1038	0.1056	0.1075	0.1093	0.1112	0.1131	0.1151	−1.2
0.1170	0.1190	0.1210	0.1230	0.1251	0.1271	0.1292	0.1314	0.1335	0.1357	−1.1
0.1379	0.1401	0.1423	0.1446	0.1469	0.1492	0.1515	0.1539	0.1562	0.1587	−1.0
0.1611	0.1635	0.1660	0.1685	0.1711	0.1736	0.1762	0.1788	0.1814	0.1841	−0.9
0.1867	0.1894	0.1922	0.1949	0.1977	0.2005	0.2033	0.2061	0.2090	0.2119	−0.8
0.2148	0.2177	0.2206	0.2236	0.2266	0.2296	0.2327	0.2358	0.2389	0.2420	−0.7
0.2451	0.2483	0.2514	0.2546	0.2578	0.2611	0.2643	0.2676	0.2709	0.2743	−0.6
0.2776	0.2810	0.2843	0.2877	0.2912	0.2946	0.2981	0.3015	0.3050	0.3085	−0.5
0.3121	0.3156	0.3192	0.3228	0.3264	0.3300	0.3336	0.3372	0.3409	0.3446	−0.4
0.3483	0.3520	0.3557	0.3594	0.3632	0.3669	0.3707	0.3745	0.3783	0.3821	−0.3
0.3859	0.3897	0.3936	0.3974	0.4013	0.4052	0.4090	0.4129	0.4168	0.4207	−0.2
0.4247	0.4286	0.4325	0.4364	0.4404	0.4443	0.4483	0.4522	0.4562	0.4602	−0.1
0.4641	0.4681	0.4721	0.4761	0.4801	0.4840	0.4880	0.4920	0.4960	0.5000	−0.0

† For $z \leq -3.90$, the areas are 0.0000 to four decimal places.

附表2-1

Values of t_α



df	$t_{0.10}$	$t_{0.05}$	$t_{0.025}$	$t_{0.01}$	$t_{0.005}$	df
1	3.078	6.314	12.706	31.821	63.657	1
2	1.886	2.920	4.303	6.965	9.925	2
3	1.638	2.353	3.182	4.541	5.841	3
4	1.533	2.132	2.776	3.747	4.604	4
5	1.476	2.015	2.571	3.365	4.032	5
6	1.440	1.943	2.447	3.143	3.707	6
7	1.415	1.895	2.365	2.998	3.499	7
8	1.397	1.860	2.306	2.896	3.355	8
9	1.383	1.833	2.262	2.821	3.250	9
10	1.372	1.812	2.228	2.764	3.169	10
11	1.363	1.796	2.201	2.718	3.106	11
12	1.356	1.782	2.179	2.681	3.055	12
13	1.350	1.771	2.160	2.650	3.012	13
14	1.345	1.761	2.145	2.624	2.977	14
15	1.341	1.753	2.131	2.602	2.947	15
16	1.337	1.746	2.120	2.583	2.921	16
17	1.333	1.740	2.110	2.567	2.898	17
18	1.330	1.734	2.101	2.552	2.878	18
19	1.328	1.729	2.093	2.539	2.861	19
20	1.325	1.725	2.086	2.528	2.845	20
21	1.323	1.721	2.080	2.518	2.831	21
22	1.321	1.717	2.074	2.508	2.819	22
23	1.319	1.714	2.069	2.500	2.807	23
24	1.318	1.711	2.064	2.492	2.797	24
25	1.316	1.708	2.060	2.485	2.787	25
26	1.315	1.706	2.056	2.479	2.779	26
27	1.314	1.703	2.052	2.473	2.771	27
28	1.313	1.701	2.048	2.467	2.763	28
29	1.311	1.699	2.045	2.462	2.756	29
30	1.310	1.697	2.042	2.457	2.750	30
31	1.309	1.696	2.040	2.453	2.744	31
32	1.309	1.694	2.037	2.449	2.738	32
33	1.308	1.692	2.035	2.445	2.733	33
34	1.307	1.691	2.032	2.441	2.728	34
35	1.306	1.690	2.030	2.438	2.724	35
36	1.306	1.688	2.028	2.434	2.719	36
37	1.305	1.687	2.026	2.431	2.715	37
38	1.304	1.686	2.024	2.429	2.712	38
39	1.304	1.685	2.023	2.426	2.708	39
40	1.303	1.684	2.021	2.423	2.704	40
41	1.303	1.683	2.020	2.421	2.701	41
42	1.302	1.682	2.018	2.418	2.698	42
43	1.302	1.681	2.017	2.416	2.695	43
44	1.301	1.680	2.015	2.414	2.692	44
45	1.301	1.679	2.014	2.412	2.690	45
46	1.300	1.679	2.013	2.410	2.687	46
47	1.300	1.678	2.012	2.408	2.685	47
48	1.299	1.677	2.011	2.407	2.682	48
49	1.299	1.677	2.010	2.405	2.680	49

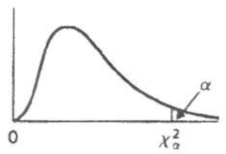
附表2-2

Values of t_α

df	$t_{0.10}$	$t_{0.05}$	$t_{0.025}$	$t_{0.01}$	$t_{0.005}$	df
50	1.299	1.676	2.009	2.403	2.678	50
51	1.298	1.675	2.008	2.402	2.676	51
52	1.298	1.675	2.007	2.400	2.674	52
53	1.298	1.674	2.006	2.399	2.672	53
54	1.297	1.674	2.005	2.397	2.670	54
55	1.297	1.673	2.004	2.396	2.668	55
56	1.297	1.673	2.003	2.395	2.667	56
57	1.297	1.672	2.002	2.394	2.665	57
58	1.296	1.672	2.002	2.392	2.663	58
59	1.296	1.671	2.001	2.391	2.662	59
60	1.296	1.671	2.000	2.390	2.660	60
61	1.296	1.670	2.000	2.389	2.659	61
62	1.295	1.670	1.999	2.388	2.657	62
63	1.295	1.669	1.998	2.387	2.656	63
64	1.295	1.669	1.998	2.386	2.655	64
65	1.295	1.669	1.997	2.385	2.654	65
66	1.295	1.668	1.997	2.384	2.652	66
67	1.294	1.668	1.996	2.383	2.651	67
68	1.294	1.668	1.995	2.382	2.650	68
69	1.294	1.667	1.995	2.382	2.649	69
70	1.294	1.667	1.994	2.381	2.648	70
71	1.294	1.667	1.994	2.380	2.647	71
72	1.293	1.666	1.993	2.379	2.646	72
73	1.293	1.666	1.993	2.379	2.645	73
74	1.293	1.666	1.993	2.378	2.644	74
75	1.293	1.665	1.992	2.377	2.643	75
80	1.292	1.664	1.990	2.374	2.639	80
85	1.292	1.663	1.988	2.371	2.635	85
90	1.291	1.662	1.987	2.368	2.632	90
95	1.291	1.661	1.985	2.366	2.629	95
100	1.290	1.660	1.984	2.364	2.626	100
200	1.286	1.653	1.972	2.345	2.601	200
300	1.284	1.650	1.968	2.339	2.592	300
400	1.284	1.649	1.966	2.336	2.588	400
500	1.283	1.648	1.965	2.334	2.586	500
600	1.283	1.647	1.964	2.333	2.584	600
700	1.283	1.647	1.963	2.332	2.583	700
800	1.283	1.647	1.963	2.331	2.582	800
900	1.282	1.647	1.963	2.330	2.581	900
1000	1.282	1.646	1.962	2.330	2.581	1000
2000	1.282	1.646	1.961	2.328	2.578	2000

附表3-1

Values of χ^2_α



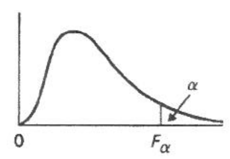
df	$\chi^2_{0.995}$	$\chi^2_{0.99}$	$\chi^2_{0.975}$	$\chi^2_{0.95}$	$\chi^2_{0.90}$
1	0.000	0.000	0.001	0.004	0.016
2	0.010	0.020	0.051	0.103	0.211
3	0.072	0.115	0.216	0.352	0.584
4	0.207	0.297	0.484	0.711	1.064
5	0.412	0.554	0.831	1.145	1.610
6	0.676	0.872	1.237	1.635	2.204
7	0.989	1.239	1.690	2.167	2.833
8	1.344	1.646	2.180	2.733	3.490
9	1.735	2.088	2.700	3.325	4.168
10	2.156	2.558	3.247	3.940	4.865
11	2.603	3.053	3.816	4.575	5.578
12	3.074	3.571	4.404	5.226	6.304
13	3.565	4.107	5.009	5.892	7.042
14	4.075	4.660	5.629	6.571	7.790
15	4.601	5.229	6.262	7.261	8.547
16	5.142	5.812	6.908	7.962	9.312
17	5.697	6.408	7.564	8.672	10.085
18	6.265	7.015	8.231	9.390	10.865
19	6.844	7.633	8.907	10.117	11.651
20	7.434	8.260	9.591	10.851	12.443
21	8.034	8.897	10.283	11.591	13.240
22	8.643	9.542	10.982	12.338	14.041
23	9.260	10.196	11.689	13.091	14.848
24	9.886	10.856	12.401	13.848	15.659
25	10.520	11.524	13.120	14.611	16.473
26	11.160	12.198	13.844	15.379	17.292
27	11.808	12.879	14.573	16.151	18.114
28	12.461	13.565	15.308	16.928	18.939
29	13.121	14.256	16.047	17.708	19.768
30	13.787	14.953	16.791	18.493	20.599
40	20.707	22.164	24.433	26.509	29.051
50	27.991	29.707	32.357	34.764	37.689
60	35.534	37.485	40.482	43.188	46.459
70	43.275	45.442	48.758	51.739	55.329
80	51.172	53.540	57.153	60.391	64.278
90	59.196	61.754	65.647	69.126	73.291
100	67.328	70.065	74.222	77.930	82.358

附表3-2

Values of χ^2_α

$\chi^2_{0.10}$	$\chi^2_{0.05}$	$\chi^2_{0.025}$	$\chi^2_{0.01}$	$\chi^2_{0.005}$	df
2.706	3.841	5.024	6.635	7.879	1
4.605	5.991	7.378	9.210	10.597	2
6.251	7.815	9.348	11.345	12.838	3
7.779	9.488	11.143	13.277	14.860	4
9.236	11.070	12.833	15.086	16.750	5
10.645	12.592	14.449	16.812	18.548	6
12.017	14.067	16.013	18.475	20.278	7
13.362	15.507	17.535	20.090	21.955	8
14.684	16.919	19.023	21.666	23.589	9
15.987	18.307	20.483	23.209	25.188	10
17.275	19.675	21.920	24.725	26.757	11
18.549	21.026	23.337	26.217	28.300	12
19.812	22.362	24.736	27.688	29.819	13
21.064	23.685	26.119	29.141	31.319	14
22.307	24.996	27.488	30.578	32.801	15
23.542	26.296	28.845	32.000	34.267	16
24.769	27.587	30.191	33.409	35.718	17
25.989	28.869	31.526	34.805	37.156	18
27.204	30.143	32.852	36.191	38.582	19
28.412	31.410	34.170	37.566	39.997	20
29.615	32.671	35.479	38.932	41.401	21
30.813	33.924	36.781	40.290	42.796	22
32.007	35.172	38.076	41.638	44.181	23
33.196	36.415	39.364	42.980	45.559	24
34.382	37.653	40.647	44.314	46.928	25
35.563	38.885	41.923	45.642	48.290	26
36.741	40.113	43.195	46.963	49.645	27
37.916	41.337	44.461	48.278	50.994	28
39.087	42.557	45.722	49.588	52.336	29
40.256	43.773	46.979	50.892	53.672	30
51.805	55.759	59.342	63.691	66.767	40
63.167	67.505	71.420	76.154	79.490	50
74.397	79.082	83.298	88.381	91.955	60
85.527	90.531	95.023	100.424	104.213	70
96.578	101.879	106.628	112.328	116.320	80
107.565	113.145	118.135	124.115	128.296	90
118.499	124.343	129.563	135.811	140.177	100

附表4-1 Values of F_α



dfd	α	dfn 1	2	3	4	5	6	7	8	9
1	0.10	39.86	49.50	53.59	55.83	57.24	58.20	58.91	59.44	59.86
	0.05	161.45	199.50	215.71	224.58	230.16	233.99	236.77	238.88	240.54
	0.025	647.79	799.50	864.16	899.58	921.85	937.11	948.22	956.66	963.28
	0.01	4052.2	4999.5	5403.4	5624.6	5763.6	5859.0	5928.4	5981.1	6022.5
	0.005	16211	20000	21615	22500	23056	23437	23715	23925	24091
2	0.10	8.53	9.00	9.16	9.24	9.29	9.33	9.35	9.37	9.38
	0.05	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38
	0.025	38.51	39.00	39.17	39.25	39.30	39.33	39.36	39.37	39.39
	0.01	98.50	99.00	99.17	99.25	99.30	99.33	99.36	99.37	99.39
	0.005	198.50	199.00	199.17	199.25	199.30	199.33	199.36	199.37	199.39
3	0.10	5.54	5.46	5.39	5.34	5.31	5.28	5.27	5.25	5.24
	0.05	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81
	0.025	17.44	16.04	15.44	15.10	14.88	14.73	14.62	14.54	14.47
	0.01	34.12	30.82	29.46	28.71	28.24	27.91	27.67	27.49	27.35
	0.005	55.55	49.80	47.47	46.19	45.39	44.84	44.43	44.13	43.88
4	0.10	4.54	4.32	4.19	4.11	4.05	4.01	3.98	3.95	3.94
	0.05	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00
	0.025	12.22	10.65	9.98	9.60	9.36	9.20	9.07	8.98	8.90
	0.01	21.20	18.00	16.69	15.98	15.52	15.21	14.98	14.80	14.66
	0.005	31.33	26.28	24.26	23.15	22.46	21.97	21.62	21.35	21.14
5	0.10	4.06	3.78	3.62	3.52	3.45	3.40	3.37	3.34	3.32
	0.05	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77
	0.025	10.01	8.43	7.76	7.39	7.15	6.98	6.85	6.76	6.68
	0.01	16.26	13.27	12.06	11.39	10.97	10.67	10.46	10.29	10.16
	0.005	22.78	18.31	16.53	15.56	14.94	14.51	14.20	13.96	13.77
6	0.10	3.78	3.46	3.29	3.18	3.11	3.05	3.01	2.98	2.96
	0.05	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10
	0.025	8.81	7.26	6.60	6.23	5.99	5.82	5.70	5.60	5.52
	0.01	13.75	10.92	9.78	9.15	8.75	8.47	8.26	8.10	7.98
	0.005	18.63	14.54	12.92	12.03	11.46	11.07	10.79	10.57	10.39
7	0.10	3.59	3.26	3.07	2.96	2.88	2.83	2.78	2.75	2.72
	0.05	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68
	0.025	8.07	6.54	5.89	5.52	5.29	5.12	4.99	4.90	4.82
	0.01	12.25	9.55	8.45	7.85	7.46	7.19	6.99	6.84	6.72
	0.005	16.24	12.40	10.88	10.05	9.52	9.16	8.89	8.68	8.51
8	0.10	3.46	3.11	2.92	2.81	2.73	2.67	2.62	2.59	2.56
	0.05	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39
	0.025	7.57	6.06	5.42	5.05	4.82	4.65	4.53	4.43	4.36
	0.01	11.26	8.65	7.59	7.01	6.63	6.37	6.18	6.03	5.91
	0.005	14.69	11.04	9.60	8.81	8.30	7.95	7.69	7.50	7.34

附表4-2

Values of F_{α}

dfn 10	12	15	20	24	30	40	60	120	α	dfd
60.19	60.71	61.22	61.74	62.00	62.26	62.53	62.79	63.06	0.10	
241.88	243.91	245.95	248.01	249.05	250.10	251.14	252.20	253.25	0.05	
968.63	976.71	984.87	993.10	997.25	1001.41	1005.60	1009.80	1014.02	0.025	1
6055.8	6106.3	6157.3	6208.7	6234.6	6260.6	6286.7	631.9	6339.4	0.01	
24224	24426	24630	24836	24940	25044	25148	25253	25359	0.005	
9.39	9.41	9.42	9.44	9.45	9.46	9.47	9.47	9.48	0.10	
19.40	19.41	19.43	19.45	19.45	19.46	19.47	19.48	19.49	0.05	
39.40	39.41	39.43	39.45	39.46	39.46	39.47	39.48	39.49	0.025	2
99.40	99.42	99.43	99.45	99.46	99.47	99.47	99.48	99.49	0.01	
199.40	199.42	199.43	199.45	199.46	199.47	199.47	199.48	199.49	0.005	
5.23	5.22	5.20	5.18	5.18	5.17	5.16	5.15	5.14	0.10	
8.79	8.74	8.70	8.66	8.64	8.62	8.59	8.57	8.55	0.05	
14.42	14.34	14.25	14.17	14.12	14.08	14.04	13.99	13.95	0.025	3
27.23	27.05	26.87	26.69	26.60	26.50	26.41	26.32	26.22	0.01	
43.69	43.39	43.08	42.78	42.62	42.47	42.31	42.15	41.99	0.005	
3.92	3.90	3.87	3.84	3.83	3.82	3.80	3.79	3.78	0.10	
5.96	5.91	5.86	5.80	5.77	5.75	5.72	5.69	5.66	0.05	
8.84	8.75	8.66	8.56	8.51	8.46	8.41	8.36	8.31	0.025	4
14.55	14.37	14.20	14.02	13.93	13.84	13.75	13.65	13.56	0.01	
20.97	20.70	20.44	20.17	20.03	19.89	19.75	19.61	19.47	0.005	
3.30	3.27	3.24	3.21	3.19	3.17	3.16	3.14	3.12	0.10	
4.74	4.68	4.62	4.56	4.53	4.50	4.46	4.43	4.40	0.05	
6.62	6.52	6.43	6.33	6.28	6.23	6.18	6.12	6.07	0.025	5
10.05	9.89	9.72	9.55	9.47	9.38	9.29	9.20	9.11	0.01	
13.62	13.38	13.15	12.90	12.78	12.66	12.53	12.40	12.27	0.005	
2.94	2.90	2.87	2.84	2.82	2.80	2.78	2.76	2.74	0.10	
4.06	4.00	3.94	3.87	3.84	3.81	3.77	3.74	3.70	0.05	
5.46	5.37	5.27	5.17	5.12	5.07	5.01	4.96	4.90	0.025	6
7.87	7.72	7.56	7.40	7.31	7.23	7.14	7.06	6.97	0.01	
10.25	10.03	9.81	9.59	9.47	9.36	9.24	9.12	9.00	0.005	
2.70	2.67	2.63	2.59	2.58	2.56	2.54	2.51	2.49	0.10	
3.64	3.57	3.51	3.44	3.41	3.38	3.34	3.30	3.27	0.05	
4.76	4.67	4.57	4.47	4.41	4.36	4.31	4.25	4.20	0.025	7
6.62	6.47	6.31	6.16	6.07	5.99	5.91	5.82	5.74	0.01	
8.38	8.18	7.97	7.75	7.64	7.53	7.42	7.31	7.19	0.005	
2.54	2.50	2.46	2.42	2.40	2.38	2.36	2.34	2.32	0.10	
3.35	3.28	3.22	3.15	3.12	3.08	3.04	3.01	2.97	0.05	
4.30	4.20	4.10	4.00	3.95	3.89	3.84	3.78	3.73	0.025	8
5.81	5.67	5.52	5.36	5.28	5.20	5.12	5.03	4.95	0.01	
7.21	7.01	6.81	6.61	6.50	6.40	6.29	6.18	6.06	0.005	

附表4-3

Values of F_{α}

dfd	α	dfn 1	2	3	4	5	6	7	8	9
	0.10	3.36	3.01	2.81	2.69	2.61	2.55	2.51	2.47	2.44
	0.05	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18
9	0.025	7.21	5.71	5.08	4.72	4.48	4.32	4.20	4.10	4.03
	0.01	10.56	8.02	6.99	6.42	6.06	5.80	5.61	5.47	5.35
	0.005	13.61	10.11	8.72	7.96	7.47	7.13	6.88	6.69	6.54
	0.10	3.29	2.92	2.73	2.61	2.52	2.46	2.41	2.38	2.35
	0.05	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02
10	0.025	6.94	5.46	4.83	4.47	4.24	4.07	3.95	3.85	3.78
	0.01	10.04	7.56	6.55	5.99	5.64	5.39	5.20	5.06	4.94
	0.005	12.83	9.43	8.08	7.34	6.87	6.54	6.30	6.12	5.97
	0.10	3.23	2.86	2.66	2.54	2.45	2.39	2.34	2.30	2.27
	0.05	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90
11	0.025	6.72	5.26	4.63	4.28	4.04	3.88	3.76	3.66	3.59
	0.01	9.65	7.21	6.22	5.67	5.32	5.07	4.89	4.74	4.63
	0.005	12.23	8.91	7.60	6.88	6.42	6.10	5.86	5.68	5.54
	0.10	3.18	2.81	2.61	2.48	2.39	2.33	2.28	2.24	2.21
	0.05	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80
12	0.025	6.55	5.10	4.47	4.12	3.89	3.73	3.61	3.51	3.44
	0.01	9.33	6.93	5.95	5.41	5.06	4.82	4.64	4.50	4.39
	0.005	11.75	8.51	7.23	6.52	6.07	5.76	5.52	5.35	5.20
	0.10	3.14	2.76	2.56	2.43	2.35	2.28	2.23	2.20	2.16
	0.05	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71
13	0.025	6.41	4.97	4.35	4.00	3.77	3.60	3.48	3.39	3.31
	0.01	9.07	6.70	5.74	5.21	4.86	4.62	4.44	4.30	4.19
	0.005	11.37	8.19	6.93	6.23	5.79	5.48	5.25	5.08	4.94
	0.10	3.10	2.73	2.52	2.39	2.31	2.24	2.19	2.15	2.12
	0.05	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65
14	0.025	6.30	4.86	4.24	3.89	3.66	3.50	3.38	3.29	3.21
	0.01	8.86	6.51	5.56	5.04	4.69	4.46	4.28	4.14	4.03
	0.005	11.06	7.92	6.68	6.00	5.56	5.26	5.03	4.86	4.72
	0.10	3.07	2.70	2.49	2.36	2.27	2.21	2.16	2.12	2.09
	0.05	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59
15	0.025	6.20	4.77	4.15	3.80	3.58	3.41	3.29	3.20	3.12
	0.01	8.68	6.36	5.42	4.89	4.56	4.32	4.14	4.00	3.89
	0.005	10.80	7.70	6.48	5.80	5.37	5.07	4.85	4.67	4.54
	0.10	3.05	2.67	2.46	2.33	2.24	2.18	2.13	2.09	2.06
	0.05	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54
16	0.025	6.12	4.69	4.08	3.73	3.50	3.34	3.22	3.12	3.05
	0.01	8.53	6.23	5.29	4.77	4.44	4.20	4.03	3.89	3.78
	0.005	10.58	7.51	6.30	5.64	5.21	4.91	4.69	4.52	4.38

附表4-4

Values of F_α

dfn 10	12	15	20	24	30	40	60	120	α	dfd
2.42	2.38	2.34	2.30	2.28	2.25	2.23	2.21	2.18	0.10	
3.14	3.07	3.01	2.94	2.90	2.86	2.83	2.79	2.75	0.05	
3.96	3.87	3.77	3.67	3.61	3.56	3.51	3.45	3.39	0.025	9
5.26	5.11	4.96	4.81	4.73	4.65	4.57	4.48	4.40	0.01	
6.42	6.23	6.03	5.83	5.73	5.62	5.52	5.41	5.30	0.005	
2.32	2.28	2.24	2.20	2.18	2.16	2.13	2.11	2.08	0.10	
2.98	2.91	2.85	2.77	2.74	2.70	2.66	2.62	2.58	0.05	
3.72	3.62	3.52	3.42	3.37	3.31	3.26	3.20	3.14	0.025	10
4.85	4.71	4.56	4.41	4.33	4.25	4.17	4.08	4.00	0.01	
5.85	5.66	5.47	5.27	5.17	5.07	4.97	4.86	4.75	0.005	
2.25	2.21	2.17	2.12	2.10	2.08	2.05	2.03	2.00	0.10	
2.85	2.79	2.72	2.65	2.61	2.57	2.53	2.49	2.45	0.05	
3.53	3.43	3.33	3.23	3.17	3.12	3.06	3.00	2.94	0.025	11
4.54	4.40	4.25	4.10	4.02	3.94	3.86	3.78	3.69	0.01	
5.42	5.24	5.05	4.86	4.76	4.65	4.55	4.45	4.34	0.005	
2.19	2.15	2.10	2.06	2.04	2.01	1.99	1.96	1.93	0.10	
2.75	2.69	2.62	2.54	2.51	2.47	2.43	2.38	2.34	0.05	
3.37	3.28	3.18	3.07	3.02	2.96	2.91	2.85	2.79	0.025	12
4.30	4.16	4.01	3.86	3.78	3.70	3.62	3.54	3.45	0.01	
5.09	4.91	4.72	4.53	4.43	4.33	4.23	4.12	4.01	0.005	
2.14	2.10	2.05	2.01	1.98	1.96	1.93	1.90	1.88	0.10	
2.67	2.60	2.53	2.46	2.42	2.38	2.34	2.30	2.25	0.05	
3.25	3.15	3.05	2.95	2.89	2.84	2.78	2.72	2.66	0.025	13
4.10	3.96	3.82	3.66	3.59	3.51	3.43	3.34	3.25	0.01	
4.82	4.64	4.46	4.27	4.17	4.07	3.97	3.87	3.76	0.005	
2.10	2.05	2.01	1.96	1.94	1.91	1.89	1.86	1.83	0.10	
2.60	2.53	2.46	2.39	2.35	2.31	2.27	2.22	2.18	0.05	
3.15	3.05	2.95	2.84	2.79	2.73	2.67	2.61	2.55	0.025	14
3.94	3.80	3.66	3.51	3.43	3.35	3.27	3.18	3.09	0.01	
4.60	4.43	4.25	4.06	3.96	3.86	3.76	3.66	3.55	0.005	
2.06	2.02	1.97	1.92	1.90	1.87	1.85	1.82	1.79	0.10	
2.54	2.48	2.40	2.33	2.29	2.25	2.20	2.16	2.11	0.05	
3.06	2.96	2.86	2.76	2.70	2.64	2.59	2.52	2.46	0.025	15
3.80	3.67	3.52	3.37	3.29	3.21	3.13	3.05	2.96	0.01	
4.42	4.25	4.07	3.88	3.79	3.69	3.58	3.48	3.37	0.005	
2.03	1.99	1.94	1.89	1.87	1.84	1.81	1.78	1.75	0.10	
2.49	2.42	2.35	2.28	2.24	2.19	2.15	2.11	2.06	0.05	
2.99	2.89	2.79	2.68	2.63	2.57	2.51	2.45	2.38	0.025	16
3.69	3.55	3.41	3.26	3.18	3.10	3.02	2.93	2.84	0.01	
4.27	4.10	3.92	3.73	3.64	3.54	3.44	3.33	3.22	0.005	

附表4-5

Values of F_α

dfd	α	dfn 1	2	3	4	5	6	7	8	9
	0.10	3.03	2.64	2.44	2.31	2.22	2.15	2.10	2.06	2.03
	0.05	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49
17	0.025	6.04	4.62	4.01	3.66	3.44	3.28	3.16	3.06	2.98
	0.01	8.40	6.11	5.18	4.67	4.34	4.10	3.93	3.79	3.68
	0.005	10.38	7.35	6.16	5.50	5.07	4.78	4.56	4.39	4.25
	0.10	3.01	2.62	2.42	2.29	2.20	2.13	2.08	2.04	2.00
	0.05	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46
18	0.025	5.98	4.56	3.95	3.61	3.38	3.22	3.10	3.01	2.93
	0.01	8.29	6.01	5.09	4.58	4.25	4.01	3.84	3.71	3.60
	0.005	10.22	7.21	6.03	5.37	4.96	4.66	4.44	4.28	4.14
	0.10	2.99	2.61	2.40	2.27	2.18	2.11	2.06	2.02	1.98
	0.05	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42
19	0.025	5.92	4.51	3.90	3.56	3.33	3.17	3.05	2.96	2.88
	0.01	8.18	5.93	5.01	4.50	4.17	3.94	3.77	3.63	3.52
	0.005	10.07	7.09	5.92	5.27	4.85	4.56	4.34	4.18	4.04
	0.10	2.97	2.59	2.38	2.25	2.16	2.09	2.04	2.00	1.96
	0.05	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39
20	0.025	5.87	4.46	3.86	3.51	3.29	3.13	3.01	2.91	2.84
	0.01	8.10	5.85	4.94	4.43	4.10	3.87	3.70	3.56	3.46
	0.005	9.94	6.99	5.82	5.17	4.76	4.47	4.26	4.09	3.96
	0.10	2.96	2.57	2.36	2.23	2.14	2.08	2.02	1.98	1.95
	0.05	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37
21	0.025	5.83	4.42	3.82	3.48	3.25	3.09	2.97	2.87	2.80
	0.01	8.02	5.78	4.87	4.37	4.04	3.81	3.64	3.51	3.40
	0.005	9.83	6.89	5.73	5.09	4.68	4.39	4.18	4.01	3.88
	0.10	2.95	2.56	2.35	2.22	2.13	2.06	2.01	1.97	1.93
	0.05	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34
22	0.025	5.79	4.38	3.78	3.44	3.22	3.05	2.93	2.84	2.76
	0.01	7.95	5.72	4.82	4.31	3.99	3.76	3.59	3.45	3.35
	0.005	9.73	6.81	5.65	5.02	4.61	4.32	4.11	3.94	3.81
	0.10	2.94	2.55	2.34	2.21	2.11	2.05	1.99	1.95	1.92
	0.05	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32
23	0.025	5.75	4.35	3.75	3.41	3.18	3.02	2.90	2.81	2.73
	0.01	7.88	5.66	4.76	4.26	3.94	3.71	3.54	3.41	3.30
	0.005	9.63	6.73	5.58	4.95	4.54	4.26	4.05	3.88	3.75
	0.10	2.93	2.54	2.33	2.19	2.10	2.04	1.98	1.94	1.91
	0.05	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30
24	0.025	5.72	4.32	3.72	3.38	3.15	2.99	2.87	2.78	2.70
	0.01	7.82	5.61	4.72	4.22	3.90	3.67	3.50	3.36	3.26
	0.005	9.55	6.66	5.52	4.89	4.49	4.20	3.99	3.83	3.69

附表4-6

Values of F_{α}

dfn: 10	12	15	20	24	30	40	60	120	α	dfd
2.00	1.96	1.91	1.86	1.84	1.81	1.78	1.75	1.72	0.10	
2.45	2.38	2.31	2.23	2.19	2.15	2.10	2.06	2.01	0.05	
2.92	2.82	2.72	2.62	2.56	2.50	2.44	2.38	2.32	0.025	17
3.59	3.46	3.31	3.16	3.08	3.00	2.92	2.83	2.75	0.01	
4.14	3.97	3.79	3.61	3.51	3.41	3.31	3.21	3.10	0.005	
1.98	1.93	1.89	1.84	1.81	1.78	1.75	1.72	1.69	0.10	
2.41	2.34	2.27	2.19	2.15	2.11	2.06	2.02	1.97	0.05	
2.87	2.77	2.67	2.56	2.50	2.44	2.38	2.32	2.26	0.025	18
3.51	3.37	3.23	3.08	3.00	2.92	2.84	2.75	2.66	0.01	
4.03	3.86	3.68	3.50	3.40	3.30	3.20	3.10	2.99	0.005	
1.96	1.91	1.86	1.81	1.79	1.76	1.73	1.70	1.67	0.10	
2.38	2.31	2.23	2.16	2.11	2.07	2.03	1.98	1.93	0.05	
2.82	2.72	2.62	2.51	2.45	2.39	2.33	2.27	2.20	0.025	19
3.43	3.30	3.15	3.00	2.92	2.84	2.76	2.67	2.58	0.01	
3.93	3.76	3.59	3.40	3.31	3.21	3.11	3.00	2.89	0.005	
1.94	1.89	1.84	1.79	1.77	1.74	1.71	1.68	1.64	0.10	
2.35	2.28	2.20	2.12	2.08	2.04	1.99	1.95	1.90	0.05	
2.77	2.68	2.57	2.46	2.41	2.35	2.29	2.22	2.16	0.025	20
3.37	3.23	3.09	2.94	2.86	2.78	2.69	2.61	2.52	0.01	
3.85	3.68	3.50	3.32	3.22	3.12	3.02	2.92	2.81	0.005	
1.92	1.87	1.83	1.78	1.75	1.72	1.69	1.66	1.62	0.10	
2.32	2.25	2.18	2.10	2.05	2.01	1.96	1.92	1.87	0.05	
2.73	2.64	2.53	2.42	2.37	2.31	2.25	2.18	2.11	0.025	21
3.31	3.17	3.03	2.88	2.80	2.72	2.64	2.55	2.46	0.01	
3.77	3.60	3.43	3.24	3.15	3.05	2.95	2.84	2.73	0.005	
1.90	1.86	1.81	1.76	1.73	1.70	1.67	1.64	1.60	0.10	
2.30	2.23	2.15	2.07	2.03	1.98	1.94	1.89	1.84	0.05	
2.70	2.60	2.50	2.39	2.33	2.27	2.21	2.14	2.08	0.025	22
3.26	3.12	2.98	2.83	2.75	2.67	2.58	2.50	2.40	0.01	
3.70	3.54	3.36	3.18	3.08	2.98	2.88	2.77	2.66	0.005	
1.89	1.84	1.80	1.74	1.72	1.69	1.66	1.62	1.59	0.10	
2.27	2.20	2.13	2.05	2.01	1.96	1.91	1.86	1.81	0.05	
2.67	2.57	2.47	2.36	2.30	2.24	2.18	2.11	2.04	0.025	23
3.21	3.07	2.93	2.78	2.70	2.62	2.54	2.45	2.35	0.01	
3.64	3.47	3.30	3.12	3.02	2.92	2.82	2.71	2.60	0.005	
1.88	1.83	1.78	1.73	1.70	1.67	1.64	1.61	1.57	0.10	
2.25	2.18	2.11	2.03	1.98	1.94	1.89	1.84	1.79	0.05	
2.64	2.54	2.44	2.33	2.27	2.21	2.15	2.08	2.01	0.025	24
3.17	3.03	2.89	2.74	2.66	2.58	2.49	2.40	2.31	0.01	
3.59	3.42	3.25	3.06	2.97	2.87	2.77	2.66	2.55	0.005	

附表4-7

Values of F_{α}

dfd	α	dfn: 1	2	3	4	5	6	7	8	9
	0.10	2.92	2.53	2.32	2.18	2.09	2.02	1.97	1.93	1.89
	0.05	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28
25	0.025	5.69	4.29	3.69	3.35	3.13	2.97	2.85	2.75	2.68
	0.01	7.77	5.57	4.68	4.18	3.85	3.63	3.46	3.32	3.22
	0.005	9.48	6.60	5.46	4.84	4.43	4.15	3.94	3.78	3.64
	0.10	2.91	2.52	2.31	2.17	2.08	2.01	1.96	1.92	1.88
	0.05	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27
26	0.025	5.66	4.27	3.67	3.33	3.10	2.94	2.82	2.73	2.65
	0.01	7.72	5.53	4.64	4.14	3.82	3.59	3.42	3.29	3.18
	0.005	9.41	6.54	5.41	4.79	4.38	4.10	3.89	3.73	3.60
	0.10	2.90	2.51	2.30	2.17	2.07	2.00	1.95	1.91	1.87
	0.05	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25
27	0.025	5.63	4.24	3.65	3.31	3.08	2.92	2.80	2.71	2.63
	0.01	7.68	5.49	4.60	4.11	3.78	3.56	3.39	3.26	3.15
	0.005	9.34	6.49	5.36	4.74	4.34	4.06	3.85	3.69	3.56
	0.10	2.89	2.50	2.29	2.16	2.06	2.00	1.94	1.90	1.87
	0.05	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24
28	0.025	5.61	4.22	3.63	3.29	3.06	2.90	2.78	2.69	2.61
	0.01	7.64	5.45	4.57	4.07	3.75	3.53	3.36	3.23	3.12
	0.005	9.28	6.44	5.32	4.70	4.30	4.02	3.81	3.65	3.52
	0.10	2.89	2.50	2.28	2.15	2.06	1.99	1.93	1.89	1.86
	0.05	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22
29	0.025	5.59	4.20	3.61	3.27	3.04	2.88	2.76	2.67	2.59
	0.01	7.60	5.42	4.54	4.04	3.73	3.50	3.33	3.20	3.09
	0.005	9.23	6.40	5.28	4.66	4.26	3.98	3.77	3.61	3.48
	0.10	2.88	2.49	2.28	2.14	2.05	1.98	1.93	1.88	1.85
	0.05	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21
30	0.025	5.57	4.18	3.59	3.25	3.03	2.87	2.75	2.65	2.57
	0.01	7.56	5.39	4.51	4.02	3.70	3.47	3.30	3.17	3.07
	0.005	9.18	6.35	5.24	4.62	4.23	3.95	3.74	3.58	3.45
	0.10	2.79	2.39	2.18	2.04	1.95	1.87	1.82	1.77	1.74
	0.05	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04
60	0.025	5.29	3.93	3.34	3.01	2.79	2.63	2.51	2.41	2.33
	0.01	7.08	4.98	4.13	3.65	3.34	3.12	2.95	2.82	2.72
	0.005	8.49	5.79	4.73	4.14	3.76	3.49	3.29	3.13	3.01
	0.10	2.75	2.35	2.13	1.99	1.90	1.82	1.77	1.72	1.68
	0.05	3.92	3.07	2.68	2.45	2.29	2.18	2.09	2.02	1.96
120	0.025	5.15	3.80	3.23	2.89	2.67	2.52	2.39	2.30	2.22
	0.01	6.85	4.79	3.95	3.48	3.17	2.96	2.79	2.66	2.56
	0.005	8.18	5.54	4.50	3.92	3.55	3.28	3.09	2.93	2.81

附表 4-8

Values of F_α

dfn 10	12	15	20	24	30	40	60	120	α	dfd
1.87	1.82	1.77	1.72	1.69	1.66	1.63	1.59	1.56	0.10	
2.24	2.16	2.09	2.01	1.96	1.92	1.87	1.82	1.77	0.05	
2.61	2.51	2.41	2.30	2.24	2.18	2.12	2.05	1.98	0.025	25
3.13	2.99	2.85	2.70	2.62	2.54	2.45	2.36	2.27	0.01	
3.54	3.37	3.20	3.01	2.92	2.82	2.72	2.61	2.50	0.005	
1.86	1.81	1.76	1.71	1.68	1.65	1.61	1.58	1.54	0.10	
2.22	2.15	2.07	1.99	1.95	1.90	1.85	1.80	1.75	0.05	
2.59	2.49	2.39	2.28	2.22	2.16	2.09	2.03	1.95	0.025	26
3.09	2.96	2.81	2.66	2.58	2.50	2.42	2.33	2.23	0.01	
3.49	3.33	3.15	2.97	2.87	2.77	2.67	2.56	2.45	0.005	
1.85	1.80	1.75	1.70	1.67	1.64	1.60	1.57	1.53	0.10	
2.20	2.13	2.06	1.97	1.93	1.88	1.84	1.79	1.73	0.05	
2.57	2.47	2.36	2.25	2.19	2.13	2.07	2.00	1.93	0.025	27
3.06	2.93	2.78	2.63	2.55	2.47	2.38	2.29	2.20	0.01	
3.45	3.28	3.11	2.93	2.83	2.73	2.63	2.52	2.41	0.005	
1.84	1.79	1.74	1.69	1.66	1.63	1.59	1.56	1.52	0.10	
2.19	2.12	2.04	1.96	1.91	1.87	1.82	1.77	1.71	0.05	
2.55	2.45	2.34	2.23	2.17	2.11	2.05	1.98	1.91	0.025	28
3.03	2.90	2.75	2.60	2.52	2.44	2.35	2.26	2.17	0.01	
3.41	3.25	3.07	2.89	2.79	2.69	2.59	2.48	2.37	0.005	
1.83	1.78	1.73	1.68	1.65	1.62	1.58	1.55	1.51	0.10	
2.18	2.10	2.03	1.94	1.90	1.85	1.81	1.75	1.70	0.05	
2.53	2.43	2.32	2.21	2.15	2.09	2.03	1.96	1.89	0.025	29
3.00	2.87	2.73	2.57	2.49	2.41	2.33	2.23	2.14	0.01	
3.38	3.21	3.04	2.86	2.76	2.66	2.56	2.45	2.33	0.005	
1.82	1.77	1.72	1.67	1.64	1.61	1.57	1.54	1.50	0.10	
2.16	2.09	2.01	1.93	1.89	1.84	1.79	1.74	1.68	0.05	
2.51	2.41	2.31	2.20	2.14	2.07	2.01	1.94	1.87	0.025	30
2.98	2.84	2.70	2.55	2.47	2.39	2.30	2.21	2.11	0.01	
3.34	3.18	3.01	2.82	2.73	2.63	2.52	2.42	2.30	0.005	
1.71	1.66	1.60	1.54	1.51	1.48	1.44	1.40	1.35	0.10	
1.99	1.92	1.84	1.75	1.70	1.65	1.59	1.53	1.47	0.05	
2.27	2.17	2.06	1.94	1.88	1.82	1.74	1.67	1.58	0.025	60
2.63	2.50	2.35	2.20	2.12	2.03	1.94	1.84	1.73	0.01	
2.90	2.74	2.57	2.39	2.29	2.19	2.08	1.96	1.83	0.005	
1.65	1.60	1.55	1.48	1.45	1.41	1.37	1.32	1.26	0.10	
1.91	1.83	1.75	1.66	1.61	1.55	1.50	1.43	1.35	0.05	
2.16	2.05	1.94	1.82	1.76	1.69	1.61	1.53	1.43	0.025	120
2.47	2.34	2.19	2.03	1.95	1.86	1.76	1.66	1.53	0.01	
2.71	2.54	2.37	2.19	2.09	1.98	1.87	1.75	1.61	0.005	