

國立聯合大學 105 學年度

暑假轉學生招生考試試題紙

科目： 財務金融學系 統計學 第 1 頁共 3 頁

Determine the true statements for the following problems.

1. If a fair die (骰子) is tossed two times and "3" shows up both times, the probability of "3" on the third trial is

(A) 0	(B) 1/6	(C) 1/36	(D) 1/216
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2. The level of significance in hypothesis testing is the probability of

(A) accepting a true null hypothesis	(B) accepting a false null hypothesis
(C) rejecting a true null hypothesis	(D) None of all is true.

3. Which of the following is a characteristic of a binomial experiment?

(A) at least 2 outcomes are possible	(B) the probability changes from trial to trial
(C) the trials are independent	(D) None of all is true.

4. As the test statistic becomes larger, the p -value

(A) gets smaller	(B) becomes larger
(C) stays the same, since the sample size has not been changed	(D) becomes negative

5. We are interested in conducting a study in order to determine what percentage of voters in a city would vote for the incumbent mayor. What is the minimum size sample needed to estimate the population proportion with a margin of error not exceeding 4% at 95% confidence?

(A) 590	(B) 596	(C) 601	(D) 625
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6. Of five letters (A, B, C, D, and E), two letters are to be selected at random. How many possible selections are possible?

(A) 12	(B) 20	(C) 125	(D) 10
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7. Some of the CDs produced by a manufacturer are defective. From the production line, 5 CDs are selected and inspected. How many sample points exist in this experiment?

(A) 5	(B) 25	(C) 32	(D) 125
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8. The random variable X is known to be uniformly distributed between 70 and 90. The probability of X having a value between 80 to 95 is

(A) 0.75	(B) 0.5	(C) 0.05	(D) 1
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9. In a standard normal distribution, the probability that Z is greater than zero is

(A) 0.5	(B) equal to 1	(C) at least 0.5	(D) 1.96
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10. The p -value

(A) is the same as the Z statistic.	(B) measures the number of standard deviations from the mean.
(C) is a distance.	(D) is a probability.

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科目： 財務金融學系 統計學 第 2 頁共 3 頁

Exhibit A. Blackwell Company produces Zip drives on two different manufacturing processes. The management of this company selects independent samples from each process. The results of the samples are shown below.

	Process A	Process B
Sample size	36	64
Sample mean (in minutes)	14	10
Population standard deviation (σ)	3	5

11. Refer to Exhibit A. The test statistic for testing the difference of the means has been calculated to be approximately

(A) 2	(B) 3	(C) 4	(D) 5
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12. Refer to Exhibit A. Based on these sample data, the p-value of testing the difference of the means is approximately

(A) less than .005	(B) between 0.025 and 0.05	(C) between 0.05 and 0.10	(D) greater than 0.1
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13. Refer to Exhibit A. At 5% significance level, the null hypothesis

(A) should not be rejected.	(B) should be rejected.	(C) was designed wrong.	(D) None of all is true.
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Exhibit B. Last school year, the student body of a local university consisted of 30% freshmen, 25% sophomores, 25% juniors, and 20% seniors. A sample of 300 students taken from this year's student body showed the following number of students in each classification. We are interested in determining whether or not there has been a significant change in the classifications between the last school year and this school year.

Freshmen	Sophomores	Juniors	Seniors
83	70	83	64

14. Refer to Exhibit A. The expected number of seniors is

(A)90	(B)90	(C) 75	(D) 60
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15. Refer to Exhibit A. The test statistic for testing the null hypothesis has been calculated to be approximately

(A) 1	(B) 2	(C) 3	(D) 4
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16. Refer to Exhibit A. The p-value is

(A) less than .005	(B) between 0.025 and 0.05	(C) between 0.05 and 0.10	(D) greater than 0.1
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17. Refer to Exhibit A. At 5% significance level, the null hypothesis

(A) should be rejected.	(B) should not be rejected.	(C) was designed wrong.	(D) None of all is true.
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Exhibit C. The sales of a grocery store had an average of \$8,000 per day. The store introduced several advertising campaigns in order to *increase* sales. To determine whether or not the advertising campaigns have been effective in increasing sales, a sample of 64 days of sales was selected. It was found that the sample average was \$8,300 per day. From past information, it is known that the standard deviation of the population is \$1,200.

18. Refer to Exhibit C. The value of the test statistic is

(A)1	(B)1.5	(C) 2	(D) 2.5
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19. Refer to Exhibit C. The p-value is

(A) less than .05	(B) between 0.05 and 0.10	(C) between 0.10 and 0.20	(D) greater than 0.2
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20. Refer to Exhibit C. At 5% significance level, the null hypothesis

(A) should be rejected.	(B) should not be rejected.	(C) was designed wrong.	(D) None of all is true.
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科目： 財務金融學系 統計學 第 3 頁共 3 頁

(表一) 若 $Z \sim N(0,1)$ ，則標準常態表的累積機率 $P(0 \leq Z \leq z)$
 例如： $P(0 \leq Z \leq 1.96) = 0.4750$

Z	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
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	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	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	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990

(表二) 若 $X \sim t(n)$ ，則單尾的 t 分配機率
 例如： $P(t(4) \geq 2.776) = 0.025$

d.f.	0.01	0.0125	0.025	0.05
1	31.821	25.452	12.706	6.314
2	6.965	6.205	4.303	2.920
3	4.541	4.177	3.182	2.353
4	3.747	3.495	2.776	2.132
5	3.365	3.163	2.571	2.015
6	3.143	2.969	2.447	1.943
7	2.998	2.841	2.365	1.895
8	2.896	2.752	2.306	1.860
9	2.821	2.685	2.262	1.833
10	2.764	2.634	2.228	1.812
11	2.718	2.593	2.201	1.796
12	2.681	2.560	2.179	1.782
13	2.650	2.533	2.160	1.771
14	2.624	2.510	2.145	1.761
15	2.602	2.490	2.131	1.753
16	2.583	2.473	2.120	1.746
17	2.567	2.458	2.110	1.740
18	2.552	2.445	2.101	1.734
19	2.539	2.433	2.093	1.729
20	2.528	2.423	2.086	1.725
21	2.518	2.414	2.080	1.721
22	2.508	2.405	2.074	1.717
23	2.500	2.398	2.069	1.714
24	2.492	2.391	2.064	1.711
25	2.485	2.385	2.060	1.708
26	2.479	2.379	2.056	1.706
27	2.473	2.373	2.052	1.703
28	2.467	2.368	2.048	1.701
29	2.462	2.364	2.045	1.699
30	2.457	2.360	2.042	1.697

(表三) 若 $X \sim \chi^2(n)$ ，則卡方分配的機率： $P(\chi^2(15) \geq 24.9958) = 0.05$ 。

d.f.	0.005	0.01	0.025	0.05	0.10	0.20
1	7.8794	6.6349	5.0239	3.8415	2.7055	1.6424
2	10.5966	9.2103	7.3778	5.9915	4.6052	3.2189
3	12.8382	11.3449	9.3484	7.8147	6.2514	4.6416
4	14.8603	13.2767	11.1433	9.4877	7.7794	5.9886
5	16.7496	15.0863	12.8325	11.0705	9.2364	7.2893
6	18.5476	16.8119	14.4494	12.5916	10.6446	8.5581
7	20.2777	18.4753	16.0128	14.0671	12.0170	9.8032
8	21.9550	20.0902	17.5345	15.5073	13.3616	11.0301
9	23.5894	21.6660	19.0228	16.9190	14.6837	12.2421
10	25.1882	23.2093	20.4832	18.3070	15.9872	13.4420
11	26.7568	24.7250	21.9200	19.6751	17.2750	14.6314
12	28.2995	26.2170	23.3367	21.0261	18.5493	15.8120
13	29.8195	27.6882	24.7356	22.3620	19.8119	16.9848
14	31.3193	29.1412	26.1189	23.6848	21.0641	18.1508
15	32.8013	30.5779	27.4884	24.9958	22.3071	19.3107
16	34.2672	31.9999	28.8454	26.2962	23.5418	20.4651
17	35.7185	33.4087	30.1910	27.5871	24.7690	21.6146
18	37.1565	34.8053	31.5264	28.8693	25.9894	22.7595
19	38.5823	36.1909	32.8523	30.1435	27.2036	23.9004
20	39.9968	37.5662	34.1696	31.4104	28.4120	25.0375
21	41.4011	38.9322	35.4789	32.6706	29.6151	26.1711
22	42.7957	40.2894	36.7807	33.9244	30.8133	27.3015
23	44.1813	41.6384	38.0756	35.1725	32.0069	28.4288
24	45.5585	42.9798	39.3641	36.4150	33.1962	29.5533
25	46.9279	44.3141	40.6465	37.6525	34.3816	30.6752

(表四) 單尾為 0.05 之 $F(m,n)$ 分配，即 $P(F(m,n) \geq f) = 0.05$ 。
 例如： $P(F(6,5) \geq 4.9503) = 0.05$ 。

	1	2	3	4	5	6	7	8	9	10	11	12
1	161.447	199.500	215.707	224.5832	230.161	233.986	236.768	238.882	240.543	241.881	242.983	243.9060
2	18.5128	19.0000	19.1643	19.2468	19.2964	19.3295	19.3532	19.3710	19.3848	19.3959	19.4050	19.4125
3	10.1280	9.5521	9.2766	9.1172	9.0135	8.9406	8.8867	8.8452	8.8123	8.7855	8.7633	8.7446
4	7.7086	6.9443	6.5914	6.3882	6.2561	6.1631	6.0942	6.0410	5.9988	5.9644	5.9358	5.9117
5	6.6079	5.7861	5.4095	5.1922	5.0503	4.9503	4.8759	4.8183	4.7725	4.7351	4.7040	4.6777
6	5.9874	5.1433	4.7571	4.5337	4.3874	4.2839	4.2067	4.1468	4.0990	4.0600	4.0274	3.9999
7	5.5914	4.7374	4.3468	4.1203	3.9715	3.8660	3.7870	3.7257	3.6767	3.6365	3.6030	3.5747
8	5.3177	4.4590	4.0662	3.8379	3.6875	3.5806	3.5005	3.4381	3.3881	3.3472	3.3130	3.2839
9	5.1174	4.2565	3.8625	3.6331	3.4817	3.3738	3.2927	3.2296	3.1789	3.1373	3.1025	3.0729
10	4.9646	4.1028	3.7083	3.4780	3.3258	3.2172	3.1355	3.0717	3.0204	2.9782	2.9430	2.9130
11	4.8443	3.9823	3.5874	3.3567	3.2039	3.0946	3.0123	2.9480	2.8962	2.8536	2.8179	2.7876
12	4.7472	3.8853	3.4903	3.2592	3.1059	2.9961	2.9134	2.8486	2.7964	2.7534	2.7173	2.6866
13	4.6672	3.8056	3.4105	3.1791	3.0254	2.9153	2.8321	2.7669	2.7144	2.6710	2.6347	2.6037
14	4.6001	3.7389	3.3439	3.1122	2.9582	2.8477	2.7642	2.6987	2.6458	2.6022	2.5655	2.5342
15	4.5431	3.6823	3.2874	3.0556	2.9013	2.7905	2.7066	2.6408	2.5876	2.5437	2.5068	2.4753
16	4.4940	3.6337	3.2389	3.0069	2.8524	2.7413	2.6572	2.5911	2.5377	2.4935	2.4564	2.4247
17	4.4513	3.5915	3.1968	2.9647	2.8100	2.6987	2.6143	2.5480	2.4943	2.4499	2.4126	2.3807
18	4.4139	3.5546	3.1599	2.9277	2.7729	2.6613	2.5767	2.5102	2.4563	2.4117	2.3742	2.3421
19	4.3807	3.5219	3.1274	2.8951	2.7401	2.6283	2.5435	2.4768	2.4227	2.3779	2.3402	2.3080
20	4.3512	3.4928	3.0984	2.8661	2.7109	2.5990	2.5140	2.4471	2.3928	2.3479	2.3100	2.2776
21	4.3248	3.4668	3.0725	2.8401	2.6848	2.5727	2.4876	2.4205	2.3660	2.3210	2.2829	2.2504
22	4.3009	3.4434	3.0491	2.8167	2.6613	2.5491	2.4638	2.3965	2.3419	2.2967	2.2585	2.2258
23	4.2793	3.4221	3.0280	2.7955	2.6400	2.5277	2.4422	2.3748	2.3201	2.2747	2.2364	2.2036
24	4.2597	3.4028	3.0088	2.7763	2.6207	2.5082	2.4226	2.3551	2.3002	2.2547	2.2163	2.1834
25	4.2417	3.3852	2.9912	2.7587	2.6030	2.4904	2.4047	2.3371	2.2821	2.2365	2.1979	2.1649