

大同大學 九十三 學年度 轉學考試 試題

考試科目：統計學 系別：事業經營學系

第 1 頁，共 2 頁

註：本次考試不可以參考自己的書籍及筆記； 不可以使用字典； 可以使用計算器。

1. Cars arrive at a car wash randomly and independently; the probability of an arrival is the same for any two time intervals of equal length. The mean arrival rate is 5 cars per hour. What is the probability that 2 or more cars will arrive during any given hour of operation? (15 points)
2. A market research firm conducts telephone surveys with a 40% historical response rate. What is the probability that in a new sample of 400 telephone numbers, at least 120 individuals will cooperate and respond to the questions? (15 points)
3. A bath soap manufacturing process is designed to produce a mean of 120 bars of soap per batch. Quantities over or under the standard are undesirable. A sample of 10 batches shows the following numbers of bars of soap. The population is assumed to be normal.

108 128 120 122 122 113 124 122 120 124

Using a .05 level of significance, test to see whether the sample results indicate that the manufacturing process is functioning properly. (20 points)

4. Starting annual salaries for individuals with master's and bachelor's degrees in business were collected in two independent random samples. Use the following data to develop a 90% confidence interval estimate of the increase in starting salary that can be expected upon completion of a master's program. (15 points)

Master's Degree	Bachelor's Degree
$n_1=60$	$n_2=80$
$\bar{x}_1 = \$40,000$	$\bar{x}_2 = \$35,000$
$s_1 = \$2,500$	$s_2 = \$2,000$

5. Using a sample of 9 days over the past 6 months, a dentist has seen the following numbers of patients: 22, 25, 20, 18, 15, 22, 24, 19, and 26. If the number of patients seen per day is normally distributed, would an analysis of these sample data reject the hypothesis that the variance in the number of patients seen per day is equal to 10? Use a .10 level of significance. Reject H_0 if $\chi^2 \leq 2.73$ or $\chi^2 \geq 15.51$ (15 points)

6. Data on the marital status of men and women ages 20 to 29 were obtained as part of a national survey. The results from a sample of 350 men and 400 women follow. These data are representative of results published in the *U.S. Current Population Report (The Statistical Abstract of the United States, 1999)*. Using $\alpha = .05$, test for independence between marital status and gender. Reject H_0 if $\chi^2 \geq 12.86$. (20 points)

Gender	Marital Status		
	Never Married	Married	Divorced
Men	234	106	10
Women	216	168	16

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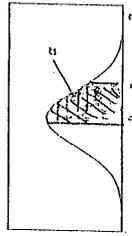
考試科目：統計學 系別：事業經營學系

第 2 頁，共 2 頁

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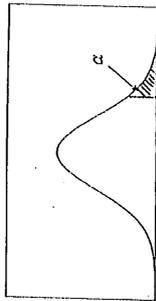
表三 標準常態累積加機率值表



$$P(Z < z) = \alpha$$

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
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	0.3483	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	0.4575	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4635
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	0.4933	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

表四 分區標準正態值表



$$P(t > t_\alpha) = \alpha$$

d.f.	1.00	1.05	1.10	1.25	1.50	2.00	3.00	4.00	5.00	10	20	∞
1	3.078	6.314	12.706	31.821	63.656	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						
∞	1.282	1.645	1.960	2.326	2.576	∞						