國立臺北商業技術學院96學年度研究所碩士班考試入學試題

准考證號碼：□□□□□□（請考生自行填寫）

財金所、商研所　　筆試科目：統計學　　

注意事項	1. 本科目合計100分，答錯不倒扣。 2. 請於答案卷上依序作答，並標註清楚題號（含小題）。 3. 考完請將答案卷及試題一併繳回。

Multiple Choice Questions: (100%)

1. To sample people who live in large buildings, which type of sampling is appropriate? (5%)
   (A) stratified sampling
   (B) cluster sampling
   (C) systematic sampling
   (D) simple random sampling
   (E) none of the above

2. If the r population means are equal, then MSTR/MSE will be : (5%)
   (A) more than 1.00
   (B) very close to 1.00
   (C) very close to 0.00
   (D) close to -1.00
   (E) a negative value between 0 and - 1

3. The number of strata should preferably be less than or equal to what value? (5%)
   (A)6 (B)10 (C)30 (D)2 (E)none of the above.

4. The coefficient of determination has which one of the following properties? (5%)
   (A) is always negative
   (B) applies to any relationship between x and y
   (C) is a ratio of unexplained variation to explained variation
   (D) has the same sign as the slope of the regression line
   (E) ranges from zero to one

5. If you have 20 pairs of subjects what would be the degrees of freedom for a test of correlation between the groups of scores? (5%)
   (A)22 (B)21 (C)20 (D)19 (E)18.

背面尚有試題

6. The deviation which is explained by the regression line can be expressed as： (5%)
   (A) the difference between each actual y value and the mean of the y's
   (B) the difference between each residual and the corresponding y value
   (C) the difference between each predicted y value and the mean of the y's
   (D) the difference between each actual y value and the predicted y value
   (E) the difference between each x value and each y value

7. In multiple regression analysis, $R^2 = 0.02$, $n = 2{,}000$, $k = 5$ and $F = 11.2$. (5%)
   (A) multicollinearity is present
   (B) none of the five variables are statistically significant
   (C) this regression is excellent for prediction purposes
   (D) there is some evidence of a linear relationship between y and at least some of the x-variables, but the regression is extremely weak and useless for prediction purposes.
   (E) not enough information to make any conclusions

8. In testing $H_0 : b_1 = b_2 = b_3 = 0$, a p-value of 0.0001, would give an indication that： (5%)
   (A) the null hypothesis should not be rejected
   (B) the null hypothesis should be rejected
   (C) all three independent variables have a slope of zero
   (D) there is no linear relationship between y and any of the three independent variables
   (E) none of the above

9. The chi-square test is used for testing： (5%)
   (A) independence
   (B) equality of proportions
   (C) equality of medians
   (D) all of the above
   (E) none of the above

10. Which one of the following is not a component of the multiplicative time series model? (5%)
    (A)trend (B)irregular variation (C)regression trend (D)seasonality (E)cyclicity.

11. A store has a mean accounts receivable of $283, with a standard deviation of $65. The accounts receivable are approximately normally distributed. Find the value such that 35% of all the accounts exceed this value. That is, find x such that: $P(X > x) = 0.35$.
(A)$215.63 (B)$257.95 (C)$308.05 (D)$350.37 (E)$291.89. (5%)

12. A certain weather forecaster is correct 80% of the time when he forecasts rain, and 90% of the time when he forecasts sun. In the area he's forecasting for, the weather is rainy 30% of the time and sunny 70% of the time. Today the forecast is for rain. What is the probability it will actually rain? (5%)
(A)0.24 (B)0.3478 (C)0.63 (D)0.7742 (E)0.913.

13. The average telephone bill in a locality is $70, with a standard deviation of $40. In a sample of 50 randomly selected phone connections, what is the probability that the sample average will exceed $75? (5%)
(A)0.0517 (B)0.1894 (C)0.3106 (D)0.4483 (E)0.8106.

14. Using two independent samples, two population means are compared to determine if a difference exists. The number in the first sample is 14 and the number in the second sample is 11. How many degrees of freedom are associated with the critical t-value?
(A)10 (B)13 (C)23 (D)24 (E)25. (5%)

15. A telephone company wants to estimate the mean number of minutes people in a city spend talking long distance, to within 7 minutes with 95% confidence. From past records, an estimate of the standard deviation is 19 minutes. What is the minimum sample size?
(A)18 (B)23 (C)26 (D)29 (E)42. (5%)

16. The width of a 95 % confidence interval for the population mean is 10 units. The sample size is large (over 100). What would be the width of a 90% confidence interval for the population mean, everything else (sample size, sample variance) remaining the same ?
(A)8.3929 (B)11.9149 (C)13.1429 (D)5.5563 (E)15.7012. (5%)

背面尚有試題

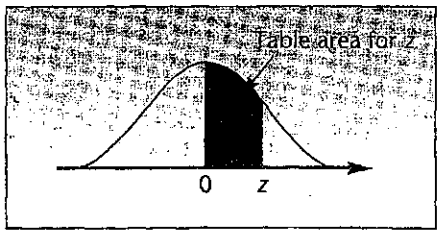
17. A tire manufacturer tests 100 tires and finds their mean life to be 25,000 miles, with a standard deviation of 1450 miles. Find a 99% lower bound for the average life of these tires. (5%)
(A)24662.875 (B)24761.475 (C)24746.25 (D)24715.8 (E)24626.625.

18. An increase in alpha, the level of significance, causes： (5%)
(A)An increase in the probability of the type I error to occur.
(B)A decrease in the probability of type I error to occur.
(C)No change in any of the type I or type II error.
(D)A decrease in the probability of type I error to occur and an increase in the probability of type II to occur.
(E)No change in the power of a test.

19. Use the following to answer questions 19-20: The average income in a certain area is assumed to be approximately $25,000. A sample of size n = 36 gives a mean of $22,000 and a sample standard deviation of $7,000. State the null and alternative hypotheses used to test whether the average income of this area is as assumed. (5%)
(A)H_0: $\mu < 25{,}000$, H_1: $\mu \geq 25{,}000$
(B)H_0: $\mu = 22{,}000$, H_1: $\mu \neq 22{,}000$
(C)H_0: $\mu \leq 25{,}000$, H_1: $\mu > 25{,}000$
(D)H_0: $\mu \geq 22{,}000$, H_1: $\mu < 22{,}000$
(E)H_0: $\mu = 25{,}000$, H_1: $\mu \neq 25{,}000$

20. If you want to carry out a statistical test at $\alpha = 0.01$, your conclusion should be： (5%)
(A)reject the null hypothesis
(B)do not reject the null hypothesis
(C)not enough information to determine
(D)only reject when the test statistic is positive
(E)only reject when the test statistic is zero.

試題至此結束



The table areas are probabilities that the standard normal random variable is between 0 and z.

	Second Decimal Place in z									
z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
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	0.3485	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
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998
3.5	0.4998									
4.0	0.49997									
4.5	0.499997									
5.0	0.4999997									
6.0	0.49999999									