淡江大學九十四學年度碩士班招生考試試題 117-1

系別：國際貿易學系
資訊管理學系

科目：統　計　學

准帶項目請打「V」	
V	簡單型計算機

本試題共 2 頁-1

本試題雙面印製

1) (a) What is meant by a statistic ? (4%)
(b) What is meant by an estimator? (4%)
(c) To estimate a parameter of a distribution (or of a population), list the properties a good estimator needed to have. (8%)

2) (a) State the probability distribution of a Binomial random variable X with parameters n *and* p. What are the mean and standard deviation of X? (4%)
(b) State the probability distribution of a Normal random variable with mean μ and standard deviation σ. (4%)
(c) When and how a Binomial distribution is well-approximated by a normal distribution ? (8%)
(d) Let X have a Binomial distribution with parameters $n=150$ *and* $p=0.60$. Approximate the probability that $82 \le X \le 101$. (6%)

3) The score of English of a student in a Graduate School Entrance Examination is a random variable having Normal distribution with mean μ and variance $\sigma^2=100$. Suppose that $X_1, X_2, \ldots, X_n$ are the n scores of English chosen randomly from the participants.
(a) What is the $100(1-\alpha)\%$ confidence interval for μ. (6%)
(b) In (a), if the length of the confidence interval is to be equal to a given number ℓ, determine the sample size n as a function of ℓ and α. (4%)
(c) Determine the sample size n, if $\ell=1$, $\alpha=0.05$. Furthermore, if the average score of the n randomly chosen participants is 58.3, compute the 95% confidence Interval for μ. (6%)

4) (a) In hypotheses testing by using a test statistic, what is meant by the $p-value$ of the test? How to use it, if the level of significance is α, $0<\alpha<1$? (8%)
(b) A new diet program states that the participants are expected to lose over 22 pounds in a month. Suppose that, from the data $X_1, X_2, \ldots, X_{56}$ of the one-month weight losses of 56 participants, the sample mean and the sample standard deviation are found to be 23.5 and 10.2 pounds, respectively. To see whether the new diet program is effective or not.
(i) Formulate the hypotheses testing problem. (4%)
(ii) To test these hypotheses, which statistic you can use? (4%)
(iii) When test with level of significance $\alpha=0.05$, what is the rejection region? Do the diet program proved to be effective on the basis of these data? (6%)
(iv) In (iii), calculate the $p-value$ and interpret the result. (6%)

◀注意背面尚有試題▶

淡江大學九十四學年度碩士班招生考試試題 117-2

系別：國際貿易學系
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准帶項目請打「V」	
V	簡單型計算機

5) Suppose that the height x (inches) and weight y (pounds) of a women basketball player has a relation with equation of the form $y = b_0 + b_1 x$.

(a) What are the least squares estimates $\hat{b}_0$ *and* $\hat{b}_1$ of b_0 *and* b_1, respectively, if we have n players' data; $(x_1, y_1), (x_2, y_2), \ldots, (x_n, y_n)$. (6%)

(b) The following data were the height and weight of the starting line-ups of a team:

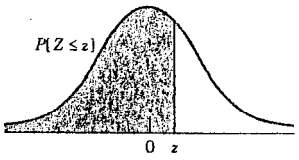
height x	68	64	62	65	66
weight y	132	108	102	115	128

. (8%)

Compute the estimated regression equation.

(c) If a player's height is 63 inches, what would you estimated her weight to be ? (4%)

Standard Normal Probabilities



z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
.7	.7580	.7611	.7642	.7673	.7703	.7734	.7764	.7794	.7823	.7852
.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998
3.5	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998