中山大学软件学院 **2010** 级软件工程专业 (2011 学年秋季学期)

《SE-203 概率统计》期末试题 (B 卷)

(考试形式：闭 卷 考试时间：2 小时)

警示

《中山大学授予学士学位工作细则》第六条

考试作弊不授予学士学位

方向：_____ 姓名：_____ 学号：_____

1. (10) The amount of radiation received at a greenhouse plays an important role in determining the rate of photosynthesis. The accompanying observations on incoming solar radiation were

   6.3 6.4 7.7 8.4 8.5 8.8 8.9 9.0 9.1 10.0 10.1 10.2
   10.6 10.6 10.7 10.7 10.8 10.9 11.1 11.2 11.4 11.9
   11.9 12.2 13.1

   (1) Construct a stem-and-leaf display of the data

   (2) Compute the following values for these sample:

   mean x , median $\tilde{x}$, fourth spread f_s (f_s = upper fourth - lower fourth), and the standard deviation s.

2. (15) Six balls are to be randomly chosen from an urn containing 8 red, 10 green, and 12 blue balls.

   (1) What is the probability at least one red ball is chosen?

   (2) Given that no red balls are chosen, what is the conditional probability that there are exactly 2 green balls among the 6 chosen?

3. (10) A customer visiting the suit department of a certain store will purchase a suit with probability 0.22, a shirt with probability 0.30, and a tie with probability 0.28. The customer will purchase both a suit and a shirt with probability 0.11, both a suit and a tie with probability 0.14, and both a shirt and a tie with probability 0.10. A customer will purchase all 3 items with probability 0.06. What is the probability that a customer purchases none of these items?
4. (10) On a multiple-choice exam with 3 possible answers for each of the 5 questions, what is the probability that a student will get 4 or more correct answers just by guessing?
5. (15) Suppose that the travel time from your home to your office is normally distributed with mean 40 minutes and standard deviation 7 minutes. If you want to be 95 percent certain that you will not be late for an office appointment at 1 P.M., what is the latest time you should leave home?
6. (15)Let X and Y be continuous random variables with joint density function

$$f(x,y)=\begin{cases}\dfrac{x}{5}+cy, & 0<x<1,1<y<5\\ 0, & otherwise\end{cases}$$

Where c is a constant.

(a) What is the value of c ?

(b) Are X and Y independent ?

(c) Find P(X+Y > 3)

7. (15) Let $X_1, X_2, \cdots, X_n$ be a random sample from a distribution X，which has the probability density function

$$f(x)=\begin{cases}\theta x^{\theta-1}, & 0<x<1 \quad (\theta>0)\\ 0, & otherwise\end{cases}$$

(a) Compute the moment estimator of θ

(b) Obtain the maximum likelihood estimator of θ

8. (10) The travel time (min) for a trip is sampled from 46 random tests, resulting in a sample mean time of 382.1 and a sample standard deviation of 31.5. Calculate a 95% upper confidence bound for true average travel time.

Table 1：Standard Normal Curve Areas

φ (x) x x	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7703	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9278	0.9292	0.9306	0.9319

1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9430	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9648	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9700	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9762	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9874	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986