

大同大學 97 學年度研究所碩士班入學考試試題

考試科目：統計學

所別：事業經營研究所

第 全 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。

- Given the following set of data: 4,9,7,7,6,3. The mean, median and mode are _____, respectively. (5%)
(a) 6, 6.5, 7 (b) 6, 7, 7 (c) 6, 6, 7 (d) 6, 6.5, 9 (e) none of above
- Please find the cumulative distribution function, $F(x)$, each of the following distributions:
(1) $f(x)=1/3, x=-1,0,1$ (5%)
(2) $f(x)=x/15, x=1,2,3,4,5$ (5%)
- A box contains b black balls and r red balls. One of the balls is drawn, but when it is put back in the box k additional balls of the same color are put in with it.
(1) What is the probability that the second ball drawn is black? (7%)
(2) What is the probability that the first ball drawn was black given that the second ball drawn was red? (8%)
- A bank can service its customers, on the average, at the rate of four customers per six-minute period. Assume the number of customers serviced to be Poisson-distributed. What is the probability that a customer will take longer than three minutes? (10%)
- Assume that the life time in hours for an un know brand of light bulb is a random variable X exponentially distributed with average failure rate equal to 2 per month. Assume there is 30 days in one moth. Please calculate the probability $P(600 < X < 800)$. (10%)
- To compare the effectiveness of two speed-reading programs, 10 pairs of people were randomly selected. Each pair consisted of people whose then current reading speeds were essentially identical. From each pair, one person was randomly selected to take Program 1; the other person to take Program 2. After the 10 pairs of people completed the speed-reading programs, their reading speeds, in words per minute, were as follows. At the 5% significance, can you conclude that there is a difference in effectiveness of the two speed-reading programs, given that the critical value is 2.262? (Note: Assume that the paired-difference variable is approximately normally distributed.) (15%)

Pair	1	2	3	4	5	6	7	8	9	10
Program1	1116	998	979	1125	910	1058	1091	1053	996	894
Program2	1032	1148	1074	1076	959	1094	1091	1098	1032	1014

- People who born between 1978 and 1983 are sometimes classified by demographers as belonging to Generation Y. According to a recent survey, of 850 Generation Y Web users, 460 reported using the Internet to download music. At the 5% significance level, do the data provide sufficient evidence to conclude that a majority of Generation Y Web users use the Internet to download music? (15 %)
- The American Automobile Manufacturers Association compiles data on U.S. car sales by type of car. Following is the 1990 distribution.

Type of car	Small	Midsize	Large	Luxury
Percentage	32.8	44.8	9.4	13

A random sample of last year's U.S. car sales yielded the following data.

Type of car	Small	Midsize	Large	Luxury
Frequency	133	249	47	71

At the 5% significance level, do the data provide sufficient evidence to conclude that last year's type-of-car distribution for U.S. car sales differs from the 1990 distribution, given that the critical value is 7.815? (20 %)