

大葉大學 95 學年度 研究所碩士班甄試 招生考試試題紙

系所別	組別	考試科目 (中文名稱)	考試日期	節次	備註
事業經營研究所		統計學	12月19日	第一節	可使用不可程式 計算機

註：1. 考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶）

2. 計算題請詳列計算步驟，否則不予計分。

背面有試題 P2-1

- Explain the following definitions. (20%)
 - p-value
 - Nominal data
 - Median
 - Ordinal data
- The AMI Company has two assembly lines in its Kansas City plant. Line A produces an average of 335 units per day with a standard deviation equal to 11 units. Line B produces an average of 145 units per day with a standard deviation equal to 8 units. Based on this information, which line is relatively more consistent? (10%)
- At the West-Side Drive-Inn, customers arrive at the rate of 10 every 30 minutes. The time between arrivals is exponentially distributed. Based on this information, what is the probability that the time between two customers arriving will exceed 6 minutes? ($e^{-2}=0.1353$) (10%)
- The manager of a department store is thinking about establishing a new billing system for the store's credit customers. After a thorough financial analysis, he determines that the new system will be cost effective only if the mean monthly account is more than \$170 ($\mu > 170$). A random sample of 400 monthly accounts is drawn for which the sample mean is \$178. The manager knows that the accounts are approximately normally distributed with a standard deviation of \$65.
 - Can he conclude from this that the new system will be cost effective? (10%)
 - Compute Type II error when actual mean monthly account $\mu = 180$. (10%)
- The Bradfield Container Company makes "cardboard" boxes for commercial use (i.e. pizza boxes). One of the big issues for the company is the set-up time required to change over from one order to the next. At one particular machine, the set-up time is thought to be uniformly distributed between 10 and 21 minutes. To test whether this is true or not, a random sample of 180 set-ups on this machine was selected with set-up time rounded to the nearest two-minute intervals. The following results occurred:

Set-up Time	Frequency	Set-up Time	Frequency
10-11 minutes	13	16-17 minutes	44
12-13 minutes	23	18-19 minutes	40
14-15 minutes	40	20-21 minutes	20

- What is the appropriate null and alternative hypothesis to be tested? (5%)
 - Based on the null and alternative hypotheses stated in part a, determine the expected frequencies for each set-up time category. (5%)
 - Compute the test statistic and carry out the hypothesis test. ($\chi_{5,0.05}^2 = 11.0705$) (10%)
- Tire manufacturers are constantly researching ways to produce tire that last longer. New innovations are tested by professional drivers on racetracks. However, any promising inventions are also test-driven by ordinary drivers. The latter tests are closer to what the tire company's customers will actually experience. Suppose that to determine whether a new steel-belt radical tire lasts longer than the company's current model, two new-design tires were installed on the rear wheels of 20 randomly selected cars and two current-design tires were installed on the rear wheels of another 20 cars. All drivers were told to drive in their usual way until the tires wore out. The number of miles driven by each driver was recorded and is shown below.

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