

# 國立嘉義大學九十三年學年度

## 運輸與物流工程研究所碩士班招生考試試題

科目：統計學

注意：本試題可使用計算機

1. The test scores of statistics are as follows. (30%)

47 54 38 69 75 54 86 43 58 61

- ( a ) Construct a stem-and-leaf plot. Is the distribution symmetric, positively skewed, negatively skewed, or binomial? (8%)
- ( b ) Find the sample mean, median, and 10% trimmed mean. (8%)
- ( c ) Compute the 10 deviations from the mean, and verify that they have a sum of zero. (6%)
- ( d ) Compute the sample variance and the standard deviation. (8%)

2. In an experiment to investigate the performance of four different brands of tires for 125-cc motorcycles, five tires of each brand were tested and number of miles until failure was observed. A partially completed ANOVA table is given: (30%)

Source of variation	df	Sum of squares	Mean square	<i>F</i>
Treatment				
Error		235419		
Total		310501		

- ( a ) Complete the ANOVA table? (15%)
  - ( b ) Perform the appropriate test of hypotheses using  $\alpha = 0.05$  and interpret your results. (15%)
3. A box has 6 balls, of which 4 are red and 2 are white. A ball is selected at random from the box and set aside. Then a ball is selected at random from the 5 balls remaining in the box. Determine the probability that both of the selected balls are red. ( 20% )
4. A system consisting of  $n$  components in parallel works if and only if at least one of the components works. Let  $w(i)$  denote the failure time of the  $i$ -th component for  $1 \leq i \leq n$ . Then, the failure time of the system is given by  $Y = \max \{ w_1, w_2, \dots, w_n \}$ . Determine the distribution function and density function of  $Y$  under the assumption that  $w_1, w_2, \dots, w_n$  are independent random variables, each being uniformly distributed on  $[a, b]$ . (20%)