

國立中央大學103學年度碩士班考試入學試題卷

所別：產業經濟研究所碩士班 產業經濟組(一般生)

科目：統計學

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本科考試禁用計算器

*請在試卷答案卷(卡)內作答

1. Three lottery tickets are drawn from a total of 10. If the tickets will be distributed to each of three employers in the order in which they are drawn, the order will be important. How many simple vents are associated with the experiment? (10%)

2. A survey of people in a given region showed that 5% were heavy drinkers. The probability of death due to liver cancer, given that a person is an alcoholic, was roughly twenty times the probability of death due to liver cancer given that a person is nonalcoholic. If the probability of death due to liver cancer in the region is 0.006. What is the probability of death due to liver cancer giving that a person is an alcoholic? (10%)

3. Airlines and hotels often grant reservations in excess of capacity to minimize losses due to no-shows. Suppose the records of a motel shows that, on the average, 10% of their prospective guests will not claim their reservation. If the motel accepts 215 reservations and there are only 200 rooms in the motel, what is the probability that all guests who arrive to claim a room will receive one? (15%)

4. Most people believe that reward themselves with sweets can relieve stress. In a survey of 2500 individuals randomly selected from the population, the sample proportions p of individuals who relieve stress by overeating sweet have an approximately normal distribution with mean value 0.5. What is the probability of observing a sample proportion as large as or larger than the observed value $\hat{p} = 0.55$? (15%)

5. Assume two groups of patients randomly assigned to two different treatment procedures of stroke. The survival days of each group were recorded as follows:

Procedure 1	Procedure II
$\overline{Day}_1 = 17.3$	$\overline{Day}_2 = 18.9$
$s_1^2 = 6.23$	$s_2^2 = 7.49$
$N_1 = 500$	$N_2 = 500$

參考用

注意：背面有試題

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Does the data present sufficient evidence to indicate a difference between the mean survival days for the two groups of patients? (15%)

6. The number of heart attacks suffered by male and females of various age group in Taipei city at January 1, 2014 is given by the following table. Test at 1% significant level the hypothesis that age and sex are independent in the occurrence of heart attacks. (15%)

Age group	Male	Female	Total
< 45	10	10	20
45~65	50	30	80
> 65	30	20	50
Total	90	60	150

7. You are given five points with these coordinates:

X	-2	-1	0	1	2
Y	1	2	4	4	3

- (a) Estimate the linear regression line $\hat{Y} = \hat{\alpha} + \hat{\beta}X$. (10%)
(b) Construct the ANOVA table for the regression. (10%)