大葉大學 九十四 學年度 研究所碩士班 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	甲、乙	統計學	3 月 27 日	第三節 13:30~15:00	P2-1

註：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）

Multiple Choice Questions (2 points for every question)

1. Positive values of covariance indicate (1) a positive variance of the x values (2) a positive variance of the y values (3) the standard deviation is positive (4) positive relation between two variables (5) none of the above.

2. The degrees of freedom for a contingency table with 12 rows and 12 columns is
(1) 12 (2) 120 (3) 121 (4) 144 (5) none of the above.

3. The level of significance can (1) be any positive value (2) be any value (3) be any value larger than 0.1 (4) be any value between -1.96 to 1.96 (5) none of the above.

4. The level of significance in hypothesis testing is the probability of (1) accepting a true null hypothesis (2) rejecting a true null hypothesis (3) accepting a false null hypothesis (4) could be any of the above, depending on the situation (5) none of the above.

5. When the following hypotheses are being tested at a level of significance of α
$$H_0: \mu \geq 100 \qquad H_1: \mu < 100$$ the null hypothesis will be rejected if the test statistic Z is (1) $> Z_\alpha$ (2) $< Z_\alpha$ (3) $< -Z_\alpha$ (4) < 100 (5) none of the above.

6. When the p-value is used for hypothesis testing, the null hypothesis is rejected if
(1) p-value $< \alpha$ (2) $\alpha <$ p-value (3) p-value $> \alpha$ (4) p-value $= \alpha$ (5) none of the above.

7. An interval estimate is a range of values used to estimate (1) the shape of the population's distribution (2) the sampling distribution (3) a sample statistic (4) a population parameter (5) none of the above.

8. The probability density function for a uniform distribution ranging between 2 and 6 is (1) 4 (2) undefined (3) 0.25 (4) any positive value (5) none of the above.

9. The measure of location which is the most likely to be influenced by extreme values in the data set is the (1) range (2) median (3) mode (4) mean (5) none of the above.

10. n=49, $\bar{x}$=54.8, S=28. $H_0: \mu = 50 \quad H_1: \mu \neq 50$. If the test is done at 95% confidence, the null hypothesis should (1) not be rejected (2) be rejected (3) Not enough information is given to answer this question. (4) none of the above.

11. In the ANOVA, treatment refers to (1) experimental units (2) different levels of a factor (3) a factor (4) applying antibiotic to a wound (5) none of the above.

12. The probability distribution of the sample mean is called the (1) central probability distribution (2) sampling distribution of the mean (3) random variation (4) standard error (5) none of the above.

13. In a standard normal distribution, the range of values of z is from (1) minus infinity to infinity (2) –1 to 1 (3) 0 to 1 (4) –3.09 to 3.09 (5) none of the above.

14. A continuous probability that is useful in describing the time, or space, between occurrences of an event is a(n) (1) normal probability distribution (2) uniform probability distribution (3) exponential probability distribution (4) Poisson probability distribution (5) none of the above.

15. In order to determine whether or not the means of four populations are equal, (1) a t test must be performed (2) an analysis of variance must be performed (3) either a t test or an analysis of variance can be performed (4) a chi-square test must be performed

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Questions

1. Independent random samples from two populations have provided the summary statistics (20 points)

	Sample 1	Sample 2
n	52	44
mean	73	66
standard deviation	78	110

(1) Obtain a point estimate of $\mu_1 - \mu_2$.

(2) Calculate the estimated standard error.

(3) Construct a 95% confidence interval for $\mu_1 - \mu_2$.

(4) Determine if there is a significant difference between the population mean scores. Use $\alpha = .05$.

2. The following data have been collected for a sample from a normal population: 10, 8, 12, 15, 13, 11, 6, 5. (10 points)

(1) What is the point estimate of the population mean?

(2) What is the point estimate of the population standard deviation?

3. A simple random sample of 400 individuals provided 200 Yes responses. (10 points)

(1) What is the point estimate of the proportion of the population who would provide Yes responses?

(2) What is the standard error of the proportion?

(3) Compute the 95% confidence interval for the population proportion.

4. Three production lines contribute to the total pool of a company's product. Line 1 provides 20% to the pool and 10% of its products are defective; Line 2 provides 50% to the pool and 5% of its products are defective; Line 3 provides 30% to the pool and 6% of its products are defective. (10 points)

(1) What percent of the items in the pool are defective?

(2) Suppose an item is randomly selected from the pool and found to be defective. What is the probability that it came from Line 1?

5. Given are five observations for two variables, x and y. (20 points)

x_i	1	2	3	4	5
y_i	3	7	5	11	14

(1) Develop a scatter diagram for these data.

(2) Compute the correlation coefficient between x and y.

(3) Develop the estimated regression equation.

(4) Use the estimated regression equation to predict the value of y when $x = 4$.