

大葉大學九十四學年度碩士班甄試試題紙

所別	組別	考試科目 (中文名稱)	考試日期	考試時間	備註
事業經營研究所 碩士班	甲	統計學	12月13日	9:00-10:30	不可使用計算機 計算題詳列計算步驟 ※背面有試題

P2-1

Multiple Choice Questions (2 points for every question)

1. In a simple regression analysis (where Y is a dependent and X an independent variable), if the Y intercept is positive, then (1) there is a positive correlation between X and Y (2) there is a negative correlation between X and Y (3) if X is increased, Y must also increase (4) if Y is increased, X must also increase (5) none of the above.
2. A regression analysis between sales (Y in \$1000) and advertising (X in dollars) resulted in the following equation $Y=50,000+6X$, (1) increase of \$6 in advertising with an increase of \$6,000 in sales (2) increase of \$1 in advertising with an increase of \$6 in sales (3) increase of \$1 in advertising with an increase of \$56,000 in sales (4) increase of \$1 in advertising with an increase of \$6,000 in sales (5) none of the above.
3. In a regression analysis if $SSE = 200$ and $SSR = 300$, then the coefficient of determination is (1) 0.6667 (2) 0.6000 (3) 0.4000 (4) 1.5000 (5) 0.7746
4. If the coefficient of determination is equal to 1, then the coefficient of correlation (1) must also be equal to 1 (2) can be either -1 or +1 (3) can be any value between -1 to +1 (4) must be -1 (5) none of the above.
5. The sampling distribution of the ratio of two independent sample variances taken from normal populations with equal variances is (1) an F distribution (2) a t distribution (3) a chi-square distribution (4) a normal distribution (5) none of the above.
6. In order not to violate the requirements necessary to use the chi-square distribution, each expected frequency in a goodness of fit test must be (1) at least 5 (2) at least 10 (3) no more than 5 (4) the number does not matter (5) none of the above.
7. In hypothesis testing if the null hypothesis is rejected, (1) no conclusions can be drawn from the test (2) the alternative hypothesis must also be rejected (3) the data must have been accumulated incorrectly (4) the sample size has been too small (5) none of the above.
8. The level of significance is the (1) maximum allowable probability of Type II error (2) maximum allowable probability of Type I error (3) same as the confidence coefficient (4) same as the p-value (5) none of the above.
9. The level of significance in hypothesis testing is the probability of (1) accepting a true null hypothesis (2) accepting a false null hypothesis (3) rejecting a true null hypothesis (4) could be any of the above, depending on the situation (5) none of the above.
10. Your investment executive claims that the average yearly rate of return on the stocks he recommends is at least 10%. You plan on taking a sample to test his claim. The correct set of hypotheses is (1) $H_0: \mu < 10\%$; $H_1: \mu \geq 10\%$ (2) $H_0: \mu \leq 10\%$; $H_1: \mu > 10\%$ (3) $H_0: \mu > 10\%$; $H_1: \mu \leq 10\%$ (4) $H_0: \mu \geq 10\%$; $H_1: \mu < 10\%$ (5) none of the above.
11. $n=36$, $\bar{x}=24.6$, $S=12$, $H_0: \mu \leq 20$, $H_1: \mu > 20$ 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.
12. If a hypothesis is rejected at the 5% level of significance, it (1) will always be rejected at the 1% level (2) will always be accepted at the 1% level (3) will never be tested at the 1% level (4) may be rejected or not rejected at the 1% level (5) none of the above.
13. The point estimator with the smaller variance is said to have (1) smaller relative efficiency (2) greater relative efficiency (3) smaller relative consistency (4) greater relative consistency (5) none of the above.
14. As the sample size increases, the (1) standard deviation of the population decreases (2) population mean increases (3) standard error of the mean decreases (4) standard error of the mean increases (5) none of the above.
15. A population characteristic, such as a population mean, is called (1) a statistic (2) a parameter (3) a sample (4) the mean deviation (5) none of the above.
16. A population has a mean of 80 and a standard deviation of 7. A sample of 49 observations will be taken. The probability that the sample mean will be larger than 82 is (1) 0.5228 (2) 0.9772 (3) 0.4772 (4) 0.0228 (5) none of the above.
17. A 95% confidence interval for a population mean is determined to be 100 to 120. If the confidence coefficient is reduced to 0.90, the interval for μ (1) becomes narrower (2) becomes wider (3) does not change (4) becomes 0.1 (5) none of the above.
18. A random sample of 100 people was taken. Eighty of the people in the sample favored Candidate A. The 95% confidence interval for the true proportion of people who favors Candidate A is (1) 0.722 to 0.878 (2) 0.762 to 0.838 (3) 78.04 to 81.96 (4) 62.469 to 97.531 (5) none of the above.
19. The weight of items produced by a machine is normally distributed with a mean of 8 ounces and a standard deviation of 2 ounces. What is the probability that a randomly selected item weighs exactly 8 ounces? (1) 0.5 (2) 1.0 (3) 0.3413 (4) 0.1587 (5) none of the above.
20. The travel time for a college student traveling between her home and her college is uniformly distributed between 40 and 90 minutes. The probability that she will finish her trip in 80 minutes or less is (1) 0.02 (2) 0.8 (3) 0.2 (4) 1.00 (5) none of the above.
21. The weight of football players is normally distributed with a mean of 200 pounds and a standard deviation of 25 pounds. What is the minimum weight of the middle 95% of the players? (1) 196 (2) 151 (3) 249 (4) 190 (5) none of the above.
22. $f(x)=(1/10)e^{-x/10}$ $x \geq 0$. The mean of x is (1) 0.10 (2) 10 (3) 100 (4) 1000 (5) none of the above.
23. A standard normal distribution is a normal distribution (1) with a mean of 1 and a standard deviation of 0 (2) with a mean of 0 and a standard deviation of 1 (3) with any mean and a standard deviation of 1 (4) with any mean and any standard deviation (5) none of the above.
24. 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.

大葉大學九十四學年度碩士班甄試試題紙

所別	組別	考試科目 (中文名稱)	考試日期	考試時間	備註
事業經營研究所 碩士班		統計學	12月13日	9:00-10:30 ※背面有試題	不可使用計算機 計算題詳列計算步驟

p2-2

25. Events A and B are mutually exclusive. Which of the following statements is also true? (1) A and B are also independent (2) $P(A \cup B) = P(A)P(B)$ (3) $P(A \cup B) = P(A) + P(B)$ (4) $(A \cap B) = P(A) + P(B)$ (5) none of the above.
26. Which of the following is not a measure of dispersion? (1) the range (2) the 50th percentile (3) the standard deviation (4) the interquartile range (5) the variance
27. Since the population size is always larger than the sample size, then the sample statistic (1) can never be larger than the population parameter (2) can never be equal to the population parameter (3) can never be zero (4) can never be smaller than population parameter (5) none of the above.
28. In constructing a frequency distribution, as the number of classes are decreased, the class width (1) decreases (2) remains unchanged (3) increases (4) can increase or decrease depending on the data values (5) none of the above.
29. Qualitative data can be graphically represented by using a(n) (1) histogram (2) frequency polygon (3) ogive (4) bar graph (5) none of the above.
30. In sample of 400 students in a university, 80, or 20%, are Business majors. The 20% is an example of (1) a sample (2) a population (3) statistical inference (4) descriptive statistics (5) none of the above.

Questions (10 points for every question)

1. Part of an ANOVA table is shown below.

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Between Treatments	180	3		
Within Treatments				
TOTAL	480	18		

** at 95% confidence, the critical value of F is 3.29

Answer the following questions:

- (1) The mean square between treatments (MSTR) is?
 - (2) The mean square within treatments (MSE) is?
 - (3) The conclusion of the test is that the means?
2. An insurance company selected samples of clients under 25 years of age and over 25 and recorded the number of accidents they had in the previous year. The results are shown below. Test with $\alpha = .05$ to determine if the accident proportions differ between the two group.

	Under Age of 25	Over Age of 25
Sample Size	400	400
Number of Accidents	76	90

3. Salary information for a random sample of male and female employees of a large company is showed below.

	Male	Female
Sample Size	64	36
Sample Mean Salary (in \$1,000)	44	41
Sample Variance	128	72

Answer the following questions:

- (1) The point estimate of the difference between the means of the two populations.
 - (2) The standard error for the difference between the two means.
 - (3) The 95% confidence interval for the difference between the means of the two populations.
 - (4) If you are interested in testing whether or not the average salary of males is significantly greater than that of females, the test statistic is?
 - (5) To determine if the salary differ between the two groups.
4. A survey of a sample of business students resulted in the following information regarding the genders of the individuals and their selected major.

	Management	Marketing	Accounting	total
male	40	10	30	80
female	30	20	70	120
total	70	30	100	200

- (1) What is the probability of selecting an individual who is majoring in Marketing?
- (2) What is the probability of selecting an individual who is majoring in Management, given that the person is female?
- (3) Given that a person is male, what is the probability that he is majoring in Management?
- (4) What is the probability of selecting a male individual?
- (5) Test at $\alpha = .01$ to determine if the business students' major is independent of their gender. With 2 degrees of freedom and a .01 area in the upper tail, $\chi^2_{.01} = 9.21$.