

國立政治大學 113 學年度第 2 學期 Quiz (1) 考試命題紙

Subject : 統計學 (二)

開課班別 : 統計學整合開課

Teacher: Han-Ming Wu

Date : 20 Mar. (Thur) 15:00-16:00

※Allowed: 「O」· Prohibited: 「×」

Pages: 3 · Copies: 45

Calculator

Textbook

Class notes

3C product

1. 需加發計算紙或答案紙請在試題內封袋備註。

2. 為環保節能減碳· 試題一律採雙面印

刷· 有特殊印製需求· 請註記: **B** 卷

備註 : 注意事項要看!! (Scope: §ch9)

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Notes:

- (1) Fill in the student ID number and name on the answer sheet ° Write down the exam sheet number you take on the top right corner of the answer sheet : **A** (default) or **B**.
- (2) Answer all questions in English (ignore the grammar and spelling) °
- (3) Answer each question in the order it appears ° The total score is 120.
- (4) It is recommended to use a dark ballpoint pen ° (pencil is allowed)
- (5) The calculation process (for parts **IV** and **V**) is required (calculate to 4 decimal places) °
- (6) Return both the answer sheet and the question sheet.

(-) Declaration (0%): Please transcribe the following oath onto the first page of the answer sheet in either Chinese or English. (複寫下列宣誓詞至答案卷的第一頁上) ° (10 points will be deducted if not written.)(不寫扣 10 分)

0. ” 本人姓名 恪遵各項考試規則· 若如違反· 願受校方最嚴厲處罰· 謹誓。 ”

”I (your name here) will strictly adhere to all examination rules. If I break this oath, I am willing to accept the most severe punishment imposed by the school. Solemnly sworn.”

(I) Multiple choice (32%, 8% each); select one correct answer.

1. For the following hypothesis test, $H_0 : \mu \geq 150$ $H_a : \mu < 150$ the test statistic (A). must be negative. (B). must be positive. (C). must be a number between zero and one. (D). can be either negative or positive.
2. For a two-tailed test, the p -value is the probability of obtaining a value for the test statistic as (A). likely as that provided by the population. (B). unlikely as that provided by the population. (C). likely as that provided by the sample. (D). unlikely as that provided by the sample.
3. Which of the following does not need to be known in order to compute the p -value? (A). Knowledge of whether the test is one-tailed or two-tailed (B). The level of significance (C). The value of the test statistic (D). The probability distribution of the test statistic
4. If the null hypothesis is rejected at the 5% level of significance, it _____ at the 1% level. (A). may be rejected or not rejected (B). will always be rejected (C). will always not be rejected (D). will never be tested

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本試題共3頁，印刷份數：45份

計算機	課本	筆記	字典	手機平板筆電
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2. 為環保節能減碳，試題一律採雙面印刷。

有特殊印製需求，請註記：**B**卷

備註：注意事項要看!! (Scope: §ch9)

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(II) Fill-in-the-blank (Correct spelling should be used if possible.) (20%, 10% each)

5. Because of high production-changeover time and costs, a director of manufacturing must convince management that a proposed manufacturing method reduces costs before the new method can be implemented. The current production method operates with a mean cost of \$220 per hour. A research study will measure the cost of the new method over a sample production period. Develop the null and alternative hypotheses most appropriate for this situation:

H_0 : _____, H_a : _____.

6. The critical value is the value of the test statistic that corresponds to an area of α in the lower (or upper) tail of the _____ of the test statistic.

(III) Short answer (20%, 10% each)(write down the statement (or definition), formula if any, interpretation)

7. What are the Type I and Type II Errors in a statistical hypothesis testing?

8. What is the p -value?

(IV) Calculation (30%, 6% each)

9. **CEO Tenure.** A shareholders' group, in lodging a protest, claimed that the mean tenure for a chief executive office (CEO) was at least nine years. A survey of companies reported in The Wall Street Journal found a sample mean tenure of $\bar{x} = 7.27$ years for CEOs with a standard deviation of $s = 6.38$ years. (Assume 85 companies were included in the sample. Set $\alpha = 0.01$.)

(a) Formulate hypotheses that can be used to challenge the validity of the claim made by the shareholders' group.

(b) What is the test statistic?

(c) Using the p -value approach to do a decision?

(d) Using the critical value approach to do a decision?

(e) What is your and conclusion?

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(V) Bonus (18%)

10. What is the relationship between interval estimation and hypothesis testing? (You can derive the formula or equations to show their relationship.)

Probability Table (機率表)

Area in Upper Tail	0.20	0.10	0.05	0.025	0.01	0.005
t value ($df = 84$)	0.846	1.292	1.663	1.989	2.372	2.636

Formula (公式)

$$df = \frac{\left(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}\right)^2}{\frac{1}{n_1-1} \left(\frac{s_1^2}{n_1}\right)^2 + \frac{1}{n_2-1} \left(\frac{s_2^2}{n_2}\right)^2}$$

<The blank pages at the back can be used as scratch paper. (後面空白頁可當計算紙)>

注意：1、考試求公平及公正，請同學務必自律，維護學校與學生之榮譽。

2、考試時不得有交談、窺視、夾帶、抄襲、傳遞、代考或其它作弊等舞弊行為，考畢務必交卷，不得攜卷出場，違者依考場規則議處。