※ 注意：全部題目均請作答於試卷內之「非選擇題作答區」，請標明題號依序作答。

一、是非題(每題兩分，正確寫T，錯誤寫F，請寫明題號及答案，題號寫錯不予計分)

1. If $X_1, ... X_n$ are n independent variables such that each expectation $E(X_i)$ exists, then $E(X_1 \cdot X_2 \cdot X_3 ... X_n) = E(X_1)E(X_2)...E(X_n)$

2. A Type II error is defined to be the probability of failing to reject a false null hypothesis.

3. Suppose that the variable under consideration is normally distributed on each of the two populations. Then for the independent sample size of n_1 and n_2 from the two populations, then $F = \frac{S_1^2/S_2^2}{\sigma_1^2/\sigma_2^2}$ has the F distribution with degree of freedom (n_1-1, n_2-1).

4. For the standard normal random variable z, $P(z = 0)$ is 0.5.

5. The matched-pair t test is used to test the difference of two means when the two selected samples are independent.

6. The mean and the variance for the z distribution and the t distribution are the same.

7. The χ^2 (chi-square) goodness-of-fit test is always demonstrated as a right-tailed test.

8. A 90 percent confidence interval for a population mean implies that there is a 0.90 probability that the population mean will be contained in the confidence interval.

9. One property of the distribution of sample means is that if the original population is normally distributed, then the distribution of the sample means is also normally distributed, regardless of the sample size.

10. If the random variable $X_1, X_2,...X_n$ form n Bernoulli trials with parameter p and if $X = X_1 \times X_2 ... \times X_n$, then X has a binomial distribution with parameter n and p.

二 單選題(每題三分，請寫明題號及答案，題號寫錯不予計分)

11. If two events A and B are independent and $P(A) \neq 0$ and $P(B) \neq 0$, then
    (A) $P(A|B) = P(A \cap B)$
    (B) $P(A|B) = P(A)P(B)$
    (C) $P(A \cap B) \neq 0$
    (D) $P(A|B) = 0$
    (E) none of the above

12. In hypothesis testing, the level of significance is the probability of
    (A) failing to reject a true null hypothesis.
    (B) failing to reject a false null hypothesis.
    (C) rejecting a false null hypothesis.
    (D) rejecting a true null hypothesis.
    (E) none of the above

見背面

13. For the following information, n=16 μ_0=15 $\overline{X}$=16 s^2=16, assume that the population is normal. Compute the test statistic for testing for a population mean.
    (A) z = 1
    (B) z = 1/4
    (C) t = 1
    (D) t = 1/4
    (E) none of the above

14. An advertising agency would like to create an advertisement for a fast food restaurant claiming that the average waiting time from ordering to receiving your order at the restaurant is less than 5 min. The agency measured the time from ordering to delivery of order for 25 customers and found that the average time was 4.7 min with a standard deviation of 0.6 min. The appropriate set of hypotheses to be tested is
    (A) *Ho:* $\mu \leq 4.7$ vs. *H_1:* $\mu > 4.7$.
    (B) *Ho:* $\mu \geq 4.7$ vs. *H_1:* $\mu < 4.7$.
    (C) *Ho:* $\mu \geq 5$ vs. *H_1:* $\mu < 5$.
    (D) *Ho:* $\mu \leq 5$ vs. *H_1:* $\mu > 5$.
    (E) none of the above

15. If two small samples are selected independently from two different normal populations with equal variances, the sampling distribution of the difference of the sample means
    (A) has a mean that is the difference of the two sample means.
    (B) has a variance that is the difference of the two variances for the two populations.
    (C) has a distribution that is normal.
    (D) has a *t* distribution.
    (E) all of the above

16. Consider the table below, formed by cross-classifying age group and brand of cola consumed.

	Under age 15	Age 15-25	Age 25-35
Cola 1	150	100	200
Cola 2	300	125	200
Cola 3	300	200	300

If you were to test whether there is any difference in the proportions of people consuming the different brands based on age, the test statistic will be
    (A) 31.029.
    (B) 26.035.
    (C) 30.996.
    (D) 31.035.
    (E) none of the above is correct

接次頁

17. A group of foreign students who would like to study in the United States registered for a special TOEFL (Test of English as a Foreign Language) preparatory course offered in their home country. They took a sample examination on the first day of classes and then retook it at the end of the course. The results for six of the students are given below.

Student	1	2	3	4	5	6
Before	325	495	525	480	525	480
After	375	520	510	515	550	490

If you want to determine whether the course helped to improve the students' scores, the appropriate degrees of freedom for the appropriate test are
(A) 6.
(B) 12.
(C) 5.
(D) 11.
(E) none of the above

18. X,Y,Z are independent and E(X)=1, E(Y)=3, E(Z)=5 Var(X)=3, Var(Y)=1, Var(Z)=2, What is the mean and variance of 2X+3Y
(A) mean=11, variance=21
(B) mean=11, variance=9
(C) mean=5.5, variance=9
(D) mean=11, variance=4
(E) none of the above

19. When computing the sample size to help construct confidence intervals for the population proportion, for a fixed margin of error of estimate and level of confidence, the sample size will be maximum when
(A) p = 0.25.
(B) (1 - p) = 0.25.
(C) p(1 -p) = 0.5.
(D) p =0.5.
(E) none of the above

20. Which of the following is true? The *t* distribution should be used when
(A). the sampling population is nonnormal.
(B). the sampling population is unimodal.
(C). the population standard deviation is unknown, the sample size is small, and the sampling distribution is normal.
(D). the population standard deviation is known.
(E). none of the above

三、名詞解釋 （每題四分，共二十分；請將題號及英文名詞寫出）

(1) Thick Description
(2) Nomothetic Causality
(3) Deductive Theory Construction
(4) Longitudinal Studies
(5) Index Validation

見背面

四、申論題（共三十分，注意每小題之配分，請寫題號）

四之一：

Annette Lareau（2003）所著的 *Unequal Childhoods: Class, Race and Family Life*， 探討美國中產階級、勞工階級和貧窮家庭子女教養方式的差異和後果。有位台灣的社會學者受到這本著作的啟發，也想進行類似的研究。她準備採取民族誌的方法，研究台灣不同家庭對小孩的教養方式，是否因為父母的階級、族群、原生國籍，和小孩的性別，而有所不同，她同時也想探討教養方式的差異如何影響小孩的社會技能和認知能力。這位社會學者預計在台灣北部選擇兩個學校，各挑一個五年級的班級，在班上實地觀察孩子的學習活動和家長—老師的互動；並從每個班級中，各挑六位學生，進入家庭生活中深度觀察孩子的日常作息、課外活動與親子互動。

（1）根據研究目的，以及你所了解的與研究主題相關的台灣社會特性，請你對對這位社會學者提出建議：她該如何選擇觀察的個案（兩個班級、十二個家庭）？請詳細說明，並闡釋做此選擇的理由。如果有人質疑這位社會學者根據你的建議所做的個案選擇「不具代表性」，你該如何為她辯護？（10 分）

（2）假設這位社會學者獲得充裕的研究經費資助，聘請了八位助理觀察孩童的班級活動和家庭生活，並深度訪談老師與父母。助理所寫的田野筆記和所做的深度訪談，是這位研究者最主要的資料來源。請問研究者該如何確保不同助理所做的觀察記錄和訪談內容具有信度（reliability）？（10 分）

四之二：

歷史取向的研究是社會學研究中的重要典範。請說明社會學的歷史研究的主要特性為何？歷史取向的研究，和多變項分析的量化研究，對於社會世界如何運作（即社會本體論的立場）是否有不同的基本預設？若有，其差異為何？（10 分）

試題隨卷繳回