

選擇題(單選：1~5題，每題2分。第6~35題，每題3分)

1. Statistical inference is concerned with
  - a. determining the value of a population characteristic by considering every member of the population
  - b. drawing conclusions about the values of population characteristics from hunches.
  - c. drawing conclusions about the values of population characteristics from appropriate samples.
  - d. drawing conclusions about the values of population characteristics from a single observation or measurement.
  
2. Of the following, the most accurate statement concerning "sampling error"(chance error)is :
  - a. This type of error cannot be totally prevented even when one is using the optimum sample design.
  - b. This type of error can not be controlled by being accurate in calculations.
  - c. This type of error can not be controlled by being accurate in measurements.
  - d. This type of error is the result of poor sample design.
  
3. All but one of the following is a measure of the variability date values. Which is not ?
 

a. Standard deviation	b. Range
c. Variance	d. Mode
  
4. There are 20 new jobs opening up at a manufacturing plant. To select the best 20 from among the hundreds of applicants for these positions, the prospective employer gives a physical exam and a written aptitude test to each applicant. Suppose 1000 people take the test and the mean grade on the test turns out to be 150 with a standard of 10. If the distribution of test scores is mound-shaped, what percentage of the test scores will fall between 130 and 160 ?
 

a. Approximately 81.5%	b. Approximately 37.5%
c. Approximately 68%	d. Approximately 95%
  
5. The median of the sample, 6, 3, 1, 4, 4, 2, 8, is :
 

a. 4	b.3.5
c. 6	d. None of the above
  
6. The standard deviation of the sample, 6, 3, 1, 4, 4, 2, 8, is :
 

a.2.5	b. 2.38
c.5.67	d. 28.00
  
7. When calculating a variance for a sample that is small,
  - a. one divides by n-1 in order to better estimate the population variance  $\sigma^2$ .
  - b. one should drop the lowest and highest values in the set to avoid bias in the results.
  - c. if dividing by n-1 is good, dividing by n-2 even better!
  - d. none of the above is true.
  
8. Suppose that a population has mean  $\mu=5$  and standard deviation  $s=1$ . Using Chebychev's Theorem, the following statements can be correctly made :
  - a. At least 3/4 of the measurements will lie between 4 and 6.
  - b. At least 3/4 of the measurements will lie between 3 and 7.
  - c. At least 5/9 of the measurements will lie between 3.5 and 6.5.
  - d. Both (b) and (c).
  
9. The purpose of a box plot is to
  - a. determine the number of observations that fall in the box.
  - b. identify outliers.
  - c. establish the interquartile range.
  - d. count the number of observations that fall within the fences.
  
10. Suppose  $P(A)=0.3$  and  $P(B)=0.5$ . Then  $P(A \cup B)$  is equal to:
 

a. 0.8	b. 0.65
c.0.6, if A and B are independent.	d. 0.8, if A and B are mutually exclusive.
e. both (c) and (d).	

(背面仍有題目,請繼續作答)

11. If  $P(A)=0.60$ ,  $P(B)=0.40$ , and  $P(B|A)=0.60$ , it follows that  $P(A|B)$  is
- 0.90
  - 0.6
  - 0.36
  - 0.10
12. If A and B are two events with  $P(A \text{ and } B)$  greater than zero, then the events A and B must
- be complementary events.
  - be independent.
  - be mutually exclusive.
  - not be mutually exclusive.
  - be dependent
13. Suppose that  $P(A)=.1$ ,  $P(B)=.3$  and  $P(A \text{ and } B)=0.5$ . The conditional probability of A given B is
- $1/2$
  - $1/3$
  - $1/6$
  - none of the above
14. The binomial distribution appears symmetrical when  $p=$
- 0
  - .1
  - .5
  - 1
  - none of the above.
15. If Z is a standard normal random variable, then  $P(Z > 1.46)$  is
- .3145
  - .4279
  - .0721
  - .1442
16. The binomial distribution approaches the normal curve in shape when
- n increases and p approaches 1.00.
  - n decreases and p approaches 0.
  - n increases and p moves away from .5.
  - n decreases and p approaches 5.
  - n increases and p moves toward .5.
17. Which of the following is a correct statement concerning the Central Limit Theorem (CLT)?
- The CLT states that the sample mean,  $\bar{x}$ , is always equal to  $\mu$ .
  - The CLT states that for large samples, sample mean  $\bar{x}$  is equal to  $\mu$ .
  - The CLT states that for large samples, the sampling distribution of the population mean is approximately normal.
  - The CLT states that for large samples, the sampling distribution of the sample mean is approximately normal.
  - Both (b) and (c) are correct.
18. Suppose that a finite population consists of the following  $N=7$  elements: 1, 6, 4, 2, 3, 0, 2. The mean and median of the population are
- estimates of the sample mean and median.
  - parameters.
  - statistics.
  - sampling distributions.
19. Suppose that a random sample of size  $n=3$  is drawn from a population that has mean 7 and variance 9. The sampling distribution of  $\bar{x}$  will have mean 7 and variance
- 5.20
  - 3.0
  - 1.73
  - 1.6
20. Suppose the statistic T is an unbiased estimator of  $\theta$  and a sample of size n is used to compute T. Which of the following is NECESSARILY true?
- The variance of the sampling distribution of T is  $\sigma/\sqrt{n}$ .
  - $T=\theta$
  - $E(\theta)=T$
  - $E(T)=\theta$
  - Variance (T) < variance ( $\theta$ )



21. If a researcher is using a 95% level of confidence in calculating a confidence interval,
- 95% of the time the computed interval will include the sample mean.
  - 5% of the time such intervals will not include the population value.
  - in the long run, 95% of all sample means will fall within the interval.
  - 95% of the time the interval will not include the population value.
22. If you used a z value of 1.96 when computing a confidence interval, you should know that in the long run such intervals would include the population value
- 99% of the time.
  - 95% of the time.
  - between 5% and 95% of the time.
  - less than 5% of the time.
23. The parameter(s) for the t-distribution is (are)
- $\mu$  and  $\sigma$ .
  - variance.
  - degrees of freedom.
  - $x^2$ .
24. If  $n_1 = 16$  and  $n_2 = 23$  and a difference between means confidence interval is being determined, the degrees of freedom for the t-value are :
- 39
  - 38
  - 7
  - 37
25. The quality control office tests bottles of shampoo to see if the filling machines are putting the proper amount in each bottle. They do not want to shut down production unless there is strong evidence indicating that the machines are not functioning properly. After testing a sample of bottles, the quality control manager decides to leave the filling machines operating. Actually, however, the filling machines are not operating properly. This is an example of :
- A Type I error.
  - A Type II error.
  - A correct decision.
26. Which of the following statements is correct regarding the null and alternative hypothesis?
- The alternative hypothesis is the one that we want to reject.
  - The null hypothesis should be identified as the one without an equality relationship.
  - One should dichotomize the possible outcomes of a process on the basis of the decision that must be made, then identify the null and alternative hypotheses accordingly.
  - All of the above.
27. If the probability of a Type I error is .10,
- a false  $H_0$  will be rejected about 10% of the time in repeated testing.
  - a true  $H_0$  will be accepted about 10% of the time in repeated testing.
  - a true  $H_0$  will be rejected about 10% of the time in repeated testing.
  - a false  $H_0$  will be accepted about 10% of the time in repeated testing.
28. In hypothesis testing,  $\alpha$  can be set as low as desired
- by increasing the sample size.
  - without having any effect on  $\beta$ .
  - only in very special situations, because most of the time researchers are limited in choice by the nature of the problem.
  - but at the expense of increasing the risk of a Type II error as  $\alpha$  is decreased.

(背面仍有題目,請繼續作答)

29. If one is making a two-tailed test and the value of the  $z$  = test statistic is  $-11.12$ , a correct conclusion from this is
- a. do not reject  $H_0$ .
  - b. a Type II error has been made.
  - c. reject  $H_0$ .
  - d. reject  $H_0$  at the  $.05$  level but not at the  $.01$  level.
30. If a confidence interval for a difference between population means is  $-8.32$  to  $38.88$ , it can be said that
- a. an error has been made; the limits must both be positive or negative.
  - b. there is, indeed, a difference between the population means.
  - c. it should not be concluded that there is a difference between the two population means.
  - d. the confidence coefficient was set at the wrong level.
31. If  $\sigma_1$  and  $\sigma_2$  are not known and  $s_1$  and  $s_2$  must be used in calculations, and if all other conditions for difference between means tests are met,
- a. the  $z$ -distribution is the appropriate distribution for determining the rejection region.
  - b. the  $t$ -distribution is the appropriate distribution for determining the rejection region.
  - c. the  $z$ -distribution is appropriate, but only if the sample sizes are both less than 30.
  - d. the  $t$ -distribution is appropriate, but only if the sample sizes are both less than 10.
32. For the chi-square tests in the analysis of enumerative data, the rejection region
- a. is always located in the lower tail of the distribution.
  - b. is always equally split in the two tails of the distribution.
  - c. is always located in the upper tail of the distribution.
  - d. depends on the probability of a Type II error.
33. The degrees of freedom associated with a contingency table possesses  $r$  rows and  $c$  columns will always equal
- a. the product of  $r \times c$
  - b. the product of  $(r-1) \times (c-1)$
  - c. the sum of  $r+c$
  - d. the product of  $r \times c$  less the sum of  $r+c$
34. Analysis of variance is useful when
- a. one is comparing two or more means.
  - b. one is comparing two or more medians.
  - c. one is comparing two or more variances.
  - d. one is comparing this month's expenditures with last month's spending patterns.
35. The test statistic used to test for equality of population means is
- a. Chi<sup>2</sup>-distributed
  - b. a ratio of the means computed in the analysis with the numerator being the largest mean and the denominator being the smallest mean.
  - c. a ratio of the variability among sample means to the variability within population.
  - d. a ratio of two standard deviations, one for among sample variation and the other for within sample variation.