※ 考生請注意：本試題不可使用計算機；單選題、滿分 100 分、每題 4 分、答錯倒扣 1 分。

1. The probability that a continuous random variable takes any specific value
   A) is equal to zero
   B) is at least 0.5
   C) depends on the probability density function
   D) is very close to 1.0

2. A simple random sample of 100 observations was taken from a large population. The sample mean and the standard deviation were determined to be 80 and 12 respectively. The standard error of the mean is
   A) 1.20
   B) 0.12
   C) 8.00
   D) 0.80

3. In point estimation
   A) data from the population is used to estimate the population parameter
   B) data from the sample is used to estimate the population parameter
   C) data from the sample is used to estimate the sample statistic
   D) the mean of the population equals the mean of the sample

4. If we consider the simple random sampling process as an experiment, the sample mean is
   A) always zero
   B) always smaller than the population mean
   C) a random variable
   D) exactly equal to the population mean

5. As the number of degrees of freedom for a t distribution increases, the difference between the t distribution and the standard normal distribution
   A) becomes larger
   B) becomes smaller
   C) stays the same
   D) None of these alternatives is correct.

6. For the interval estimation of μ when σ is known and the sample is large, the proper distribution to use is
   A) the normal distribution
   B) the t distribution with n degrees of freedom
   C) the t distribution with n + 1 degrees of freedom
   D) the t distribution with n + 2 degrees of freedom

7. For which of the following values of P is the value of P(1 - P) maximized?
   A) P = 0.99
   B) P = 0.90
   C) P = 0.01
   D) P = 0.50

8. After computing a confidence interval, the user believes the results are meaningless because the width of the interval is too large. Which one of the following is the best recommendation?
   A) Increase the level of confidence for the interval.
   B) Decrease the sample size.
   C) Increase the sample size.
   D) Reduce the population variance.

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9. In hypothesis testing,
   A) the smaller the Type I error, the smaller the Type II error will be
   B) the smaller the Type I error, the larger the Type II error will be
   C) Type II error will not be effected by Type I error
   D) the sum of Type I and Type II errors must equal to 1

10. The *p*-value is a probability that measures the support (or lack of support) for the
    A) null hypothesis
    B) alternative hypothesis
    C) either the null or the alternative hypothesis
    D) sample statistic

11. In hypothesis testing if the null hypothesis is rejected,
    A) no conclusions can be drawn from the test
    B) the alternative hypothesis is true
    C) the data must have been accumulated incorrectly
    D) the sample size has been too small

12. The power curve provides the probability of
    A) correctly accepting the null hypothesis
    B) incorrectly accepting the null hypothesis
    C) correctly rejecting the alternative hypothesis
    D) correctly rejecting the null hypothesis

13. If we are interested in testing whether the proportion of items in population 1 is larger than the proportion of items in population 2, the
    A) null hypothesis should state $P_1 - P_2 < 0$
    B) null hypothesis should state $P_1 - P_2 \geq 0$
    C) alternative hypothesis should state $P_1 - P_2 > 0$
    D) alternative hypothesis should state $P_1 - P_2 < 0$

14. The standard error of $\bar{x}_1 - \bar{x}_2$ is the
    A) variance of $\bar{x}_1 - \bar{x}_2$
    B) variance of the sampling distribution of $\bar{x}_1 - \bar{x}_2$
    C) standard deviation of the sampling distribution of $\bar{x}_1 - \bar{x}_2$
    D) difference between the two means

15. We are interested in testing whether the variance of a population is significantly less than 1.44. The null hypothesis for this test is
    A) $H_o: \sigma^2 < 1.44$
    B) $H_o: s^2 \geq 1.44$
    C) $H_o: \sigma \leq 1.20$
    D) $H_o: \sigma^2 \geq 1.44$

16. The sampling distribution of the ratio of independent sample variances extracted from two normal populations with equal variances is the
    A) chi-square distribution
    B) normal distribution
    C) Z distribution
    D) t distribution

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17. Which of the following has a chi-square distribution?
    A) $(n-1)\sigma^2/S^2$
    B) $(n-2)\sigma^2/S^2$
    C) $(n-1)S/\sigma$
    D) $(n-1)S^2/\sigma^2$

18. An important application of the chi-square distribution is
    A) making inferences about a single population variance
    B) testing for goodness of fit
    C) testing for the independence of two variables
    D) All of these alternatives are correct.

19. An ANOVA procedure is applied to data obtained from 6 samples where each sample contains 20 observations. The degrees of freedom for the critical value of F are
    A) 6 numerator and 20 denominator degrees of freedom
    B) 5 numerator and 20 denominator degrees of freedom
    C) 5 numerator and 114 denominator degrees of freedom
    D) 6 numerator and 20 denominator degrees of freedom

20. In order to determine whether or not the means of two populations are equal,
    A) a t test must be performed
    B) an analysis of variance must be performed
    C) either a t test or an analysis of variance can be performed
    D) a chi-square test must be performed

Exhibit A
Part of an ANOVA table is shown below.

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Between Treatments	64			8
Within Treatments			2	
Error				
Total	100			

21. Refer to Exhibit A. The number of degrees of freedom corresponding to between treatments is
    A) 18
    B) 2
    C) 4
    D) 3

22. Refer to Exhibit A. The number of degrees of freedom corresponding to within treatments is
    A) 22
    B) 4
    C) 5
    D) 18

23. Refer to Exhibit A. The mean square between treatments (MSTR) is
    A) 36
    B) 16
    C) 64
    D) 15

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24. In regression analysis, which of the following is **not** a required assumption about the error term ε?
    A) The expected value of the error term is one.
    B) The variance of the error term is the same for all values of X.
    C) The values of the error term are independent.
    D) The error term is normally distributed.

25. In a regression analysis, the variable that is being predicted
    A) must have the same units as the variable doing the predicting
    B) is the independent variable
    C) is the dependent variable
    D) usually is denoted by x