08 HYPOTHESIS TESTING

1. Which of the following statements about parametric and nonparametric tests is least accurate?
   (A) Nonparametric tests rely on population parameters.
   (B) The test of the difference in means is used when you are comparing means from two independent samples.
   (C) The test of the mean of the differences is used when performing a paired comparison.

2. A survey is taken to determine whether the average starting salaries of CFA charter holders is equal to or greater than $54,000 per year. Assuming a normal distribution, what is the test statistic given a sample of 75 newly acquired CFA charter holders with a mean starting salary of $57,000 and a standard deviation of $1,300?
   (A) -19.99.
   (B) 19.99.
   (C) 2.31.

3. A test of whether a mutual fund's performance rank in one period provides information about the fund's performance rank in a subsequent period is best described as a:
   (A) mean-rank test.
   (B) nonparametric test.
   (C) parametric test.

4. Kyra Mosby, M.D., has a patient who is complaining of severe abdominal pain. Based on an examination and the results from laboratory tests, Mosby states the following diagnosis
   hypothesis: H_o: Appendicitis, H_A : Not Appendicitis. Dr. Mosby removes the patient's appendix and the patient still complain of pain. Subsequent tests show that the gall bladder was causing the problem. By taking out the patient's appendix, Dr. Mosby:
   (A) made a Type II error.
   (B) made a Type I error.
   (C) is correct.

5. If an analyst wants to perform hypothesis testing using a chi-square test, which of the following values is he most likely assessing?
   (A) The value of a population mean.
   (B) The value of a population variance.
   (C) Whether two population variances are equal.

6. Which of the following statements about hypothesis testing is least accurate?
   (A) A Type I error is the probability of rejecting the null hypothesis when the null hypothesis is false.
   (B) The significance level is the probability of making a Type I error.
   (C) A Type II error is the probability of failing to reject a null hypothesis that is not true.

7. A survey is taken to determine whether the average starting salaries of CFA charter holders is equal to or greater than $59,000 per year. What is the test statistic given a sample of 135 newly acquired CFA charter holders with a mean starting salary of $64,000 and a standard deviation of $5,500?
   (A) 0.91.
   (B) 10.56.
   (C) -10.56

8. A survey is taken to determine whether the average starting salaries of CFA charter holders is equal to or greater than $57,000 per year. Assuming a normal distribution, what is the test statistic given a sample of 115 newly acquired CFA charter holders with a mean starting salary of $65,000 and a standard deviation of $4,500?
   (A) 1.78.
   (B) .06.
   (C) -19.06.

9. If a two-tailed hypothesis test has a 5% probability of rejecting the null hypothesis when the null is true, it is most likely that:
   (A) the probability of a Type I error is 2.5%.
   (B) the power of the test is 95%.
   (C) the confidence level of the test is 95%.

10. If a two-tailed hypothesis test has a 5% probability of rejecting the null hypothesis when the null is true, it is most likely that the:
    (A) power of the test is 95%.
    (B) significance level of the test is 5%.
    (C) probability of a Type I error is 2.5%.

11. Lucy James, CFA, is constructing a hypothesis test using a 5% level of significance. If she is interested in increasing the "power of the test," she should consider:
    (A)   lowering the level of significance.
    (B)   keeping the significance level, the same and increasing the sample size.
    (C)   increasing the probability of a Type II error.

12. If the probability of a Type I error decreases, then the probability of:
    (A)   incorrectly accepting the null decreases.
    (B)   incorrectly rejecting the null increases.
    (C)   a Type II error increases

13. Which of the following statements about hypothesis testing is most accurate?
    (A)   A Type I error is rejecting the null hypothesis when it is true, and a Type II error is rejecting the alternative hypothesis when it is true.
    (B)   A hypothesis that the population mean is less than or equal to 5 should be rejected when the critical Z-statistic is greater than the sample Z-statistic.
    (C)   A hypothesized mean of 3, a sample mean of 6, and a standard error of the sampling means of 2 give a sample Z-statistic of 1.5.

14. The power of the test is:
    (A)   the probability of rejecting a true null hypothesis.
    (B)   equal to the level of confidence.
    (C)   the probability of rejecting a false null hypothesis.

15. If a one-tailed z-test uses a 5% significance level, the test will reject a:
    (A)   true null hypothesis 95% of the time.
    (B)   true null hypothesis 5% of the time.
    (C)   false null hypothesis 95% of the time.

16. A Type I error is made when the researcher:
    (A)   rejects the null hypothesis when it is actually true.
    (B)   rejects the alternative hypothesis when it is actually true.
    (C)   fails to reject the null hypothesis when it is actually false.

17. An analyst decides to select 10 stocks for her portfolio by placing the ticker symbols for all the stocks traded on the New York Stock Exchange in a large bowl. She randomly selects 20 stocks and will put every other one chosen into her 10-stock portfolio. The analyst used:
    (A)   stratified random sampling.
    (B)   simple random sampling.
    (C)   dual random sampling.

18. A Type I error:

   (A) fails to reject a false null hypothesis.

   (B) rejects a true null hypothesis.

   (C) rejects a false null hypothesis.

19. A financial analyst is constructing a hypothesis test to assess whether the mean daily retur non a portfolio of blue-chip stocks is statistically different from zero. The sample size is 128trading days, the mean return is 0.14%, and the standard deviation is 0.18%. With the null hypothesis that the daily portfolio return is equal to zero, which of the following changes invariables will independently make it more likely that the null is rejected?

   (A) An increase in the standard deviation of the returns to 0.23%.

   (B) A move of the mean return down to 0.11%.

   (C) An increase in the sample size to 140.

20. A survey is taken to determine whether the average starting salaries of CFA charterholders is equal to or greater than $58,500 per year. What is the test statistic given a sample of 175CFA charterholders with a mean starting salary of $67,000 and a standard deviation of $5,200?

   (A) 1.63.

   (B) −1.63.

   (C) 21.62.

21. Which of the following statements regarding hypothesis testing is least accurate?

   (A) The significance level is the risk of making a type I error.

   (B) A type I error is acceptance of a hypothesis that is actually false.

   (C) A type II error is the acceptance of a hypothesis that is actually false.

22. An analyst calculates that the mean of a sample of 200 observations is 5. The analyst wants to determine whether the calculated mean, which has a standard error of the sample statistic of 1, is significantly different from 7 at the 5% level of significance. Which of the following statements is least accurate?:

   (A) The null hypothesis would be: H_0 : mean = 7.

   (B) The alternative hypothesis would be H_a : mean > 7.

   (C) The mean observation is significantly different from 7, because the calculated Z-statistic is less than the critical Z-statistic.

23. Bo Rigley, CFA, is a financial analyst examining large-cap equity returns over a calendar year. His sample size is 252 trading days, and he observes a mean return of 0.07% and a standard deviation of 0.12%. With his null hypothesis that the daily portfolio return is equal to zero and a 10% level of significance, Rigley will:

(A) reject the null because the test statistic is greater than the critical value.

(B) not reject the null because the test statistic is less than the critical value.

(C) not reject the null because the test statistic is greater than the critical value.

24. Which of the following statements about hypothesis testing is least accurate?

A Type I erroris the probability of:

(A) rejecting a true null hypothesis.

(B) failing to reject a false hypothesis.

(C) rejecting a true alternative hypothesis.

25. For a hypothesis test regarding a population parameter, an analyst has determined that the probability of failing to reject a false null hypothesis is 18%, and the probability of rejecting a true null hypothesis is 5%. The power of the test is:

(A) 0.95.

(B) 0.18.

(C) 0.82.

26. Which of the following statements about hypothesis testing is least accurate?

(A) If the alternative hypothesis is $H_a : \mu > \mu_O$, a two-tailed test is appropriate.

(B) A Type II error is failing to reject a false null hypothesis.

(C) The null hypothesis is a statement about the value of a population parameter.

27. Which of the following statements about hypothesis testing is most accurate?

(A) The probability of a Type I error is equal to the significance level of the test.

(B) The power of a test is one minus the probability of a Type I error.

(C) If you can disprove the null hypothesis, then you have proven the alternative hypothesis.

28. Ron Jacobi, manager with the Toulee Department of Natural Resources, is responsible for setting catch-and-release limits for Lake Norby, a large and popular fishing lake. He takes a sample to determine whether the mean length of Northern Pike in the lake exceeds 18inches. If the sample t-statistic indicates that the mean length of the fish is significantly greater than 18 inches, when the population mean is actually 17.8 inches, the t-test resulted in:

(A) both a Type I and a Type II error.

(B) a Type II error only.

(C) a Type I error only.

29. A Type II error:

(A) rejects a true null hypothesis.

(B) fails to reject a false null hypothesis.

(C) fails to reject a true null hypothesis.

30. A data analyst compares the P/E ratios for two companies over a period of 20 years and calculates a two-tailed F-statistic that exceeds the critical F-statistic value. As a result of her findings, she will:

(A) not reject the null hypothesis that the P/E ratio variances between the two companies are significantly different.

(B) reject the null hypothesis that the P/E ratio variances between the two companies are significantly different.

(C) reject the null hypothesis that the P/E ratio variances between the two companies are not significantly different.

31. John Jenkins, CFA, is performing a study on the behavior of the mean P/E ratio for a sample of small-cap companies. Which of the following statements is most accurate?

(A) A Type I error represents the failure to reject the null hypothesis when it is, in fact, false.

(B) One minus the confidence level of the test represents the probability of making a Type II error.

(C) The significance level of the test represents the probability of making a Type I error.

32. Which of the following statements about hypothesis testing is most accurate? A Type II error is the probability of:

(A) failing to reject a false null hypothesis.

(B) rejecting a true alternative hypothesis.

(C) rejecting a true null hypothesis.

33. A researcher is testing whether the average age of employees in a large firm is statistically different from 35 years (either above or below). A sample is drawn of 250 employees and the researcher determines that the appropriate critical value for the test statistic is 1.96. The value of the computed test statistic is 4.35. Given this information, which of the following statements is least accurate? The test:

(A) indicates that the researcher will reject the null hypothesis.

(B) has a significance level of 95%.

(C) indicates that the researcher is 95% confident that the average employee age is different than 35 years.

34. For a two-tailed test of hypothesis involving a z-distributed test statistic and a 5% level of significance, a calculated z-statistic of 1.5 indicates that:

(A) the null hypothesis cannot be rejected.

(B) the test is inconclusive.

(C) the null hypothesis is rejected.