Sample Multiple Choice Problems for the Final Exam

~~Chapter 6, Section 2~~ == Ignore this question.

1. If we have a sample size of 100 and the estimate of the population proportion is .10, the standard deviation of the sampling distribution of the sample proportion is:
   A) .0009
   B) .03
   C) 3
   D) 9
   E) .10

Chapter 7

2. A survey of 49 people revealed that the mean number of minutes a person talks on his or her wireless phone in one day in a particular locality is 26, with a standard deviation of 2.3. Give a 99% confidence interval for the average daily usage. **(Hint: 2.3 is the sample std. dev. s.)**
   A) [25.08, 26.92]
   B) [25.14, 26.86]
   C) [25.12, 26.88]
   D) [25.17, 26.83]
   E) [25.92, 26.92]

3. A person measures the contents of 36 pop cans and finds the mean content to be 12.1 fluid ounces with a standard deviation of 0.2 ounces. Construct a 99% confidence interval for the average fluid content of a can. **(Hint: 0.2 is the sample std. dev. s.)**
   A) [12.014, 12.186]
   B) [12.019, 12.181]
   C) [12.009, 12.191]
   D) [12.022, 12.178]
   E) [12.035, 12.165]

4. A telephone company wants to estimate the mean number of minutes people in a city spend talking long distance with 95% confidence. From past records, an estimate of the standard deviation is 12 minutes. What is the minimum sample size required if the desired width of the confidence interval is 10 minutes? **(Hint: 12 is the population std. dev. sigma.)**
   A) 28
   B) 11
   C) 23
   D) 19
   E) 42

5. An interval's confidence level, calculated as _____, provides an estimate of the likelihood that it contains the _____ of interest.
   A) (1-a)*100%; population parameter
   B) (1-a)*100%; sample statistic
   C) (1-a/2)*100%; population parameter
   D) (1-a/2)*100%; sample statistic
   E) (a*100%); population parameter

Chapter 8

6. An advertiser is believed to exaggerate claims about a company's product, (high performance, larger measurable average). An agency wants to prove that this advertiser's claims are exaggerated. There are data available. The correct hypothesis test will be: **(Hint: Left-tailed because a small test stat xBar may be enough to reject advertiser's claim.)**
   A) Two-tailed test
   B) Right-hand tailed test
   C) Left-hand tailed test
   D) None of the above

7. If I want to test the null hypothesis that the mean is 100 versus the alternative that it is greater than 100 and I get a sample mean of 90, which is true? **(Hint: If sample mean is less than hypothesized mean, there is no justification to reject.)**
   A) I cannot say anything, I need to know the standard deviation and the sample size
   B) Always reject the null hypothesis
   C) Never reject the null hypothesis
   D) Reject the null if n > 30, otherwise fail to reject
   E) None of the above

8. If $\alpha = .01$ for a two-tailed hypothesis test using the z test, the critical values are:
   A) ± 1.90
   B) ± 1.96
   C) ± 2.00
   D) ± 2.33
   E) ± 2.58

9. Suppose that n = 100 and that we want to test whether the population mean is equal to 20 versus the alternative that it is not equal to 20. The sample mean is found to be 18 and the sample standard deviation is 10. Compute the p-value for this test.
   A) 0.0228
   B) 0.0456
   C) 0.5532
   D) 1.00
   E) 0

10. An analyst is conducting a test involving the following pair of hypotheses:
    H0: μ £ 100 vs. H1: μ > 100
    The population is known to be normally distributed with a standard deviation of 24. Assume an alpha of 0.05 and a sample size if 36. The probability of making a Type II error if the population mean actually equals 105 is _____.
    (This requires the calculation of beta=Pr(Accept H0 | H0 false) with mu as 105. Calculate xBaralpha using alpha=0.05, sigma=24 and n=36 for H0: mu=100. We have xBaralpha=100+4*1.644=106.58. Now calculate beta using xbaralpha=106.58 and the other values for Ha: mu=105. This should give something around 0.66.
    A) 0.3464
    B) 0.4738
    C) 0.5000
    D) 0.5262
    E) 0.6536

Chapter 9

11. To test whether or not two population variances are equal, the appropriate distribution is:
    A) Z distribution
    B) Chi-square distribution
    C) F distribution
    D) T distribution with n1 + n2 - 2 degrees of freedom
    E) None of the above

12. Using two independent samples, two population means are compared to determine if a difference exists. The number in the first sample is 15 and the number in the second sample is 12. How many degrees of freedom are associated with the critical t-value?
    A) 27
    B) 26
    C) 25
    D) None of the above

13. Before a researcher can proceed with hypothesis tests involving a potential difference in population means, she hopes to first establish that the two population variances are equal. In a random sample of 16 observations from each of populations 1 and 2, she observes sample variances of, respectively, 33 and 47. Given a = 0.10, the critical lower and upper values for F are, respectively:
    A) FLOWER = 0.32, FUPPER = 3.10
    B) FLOWER = 0.37, FUPPER = 2.67
    C) FLOWER = 0.39, FUPPER = 2.60
    D) FLOWER = 0.42, FUPPER = 2.40
    E) FLOWER = 0.45, FUPPER = 2.22

14. When conducting hypothesis tests regarding the differences in means across two populations, an important assumption typically is that:
    A) The populations are not normally distributed
    B) The populations have equivalent correlations
    C) The populations have similar p-values
    D) The populations have similar means
    E) None of the above

15. In a test comparing two population means drawn from independent samples, the 8 observations from population 1 had a sample standard deviation of 3.15 and the 11 observations from population 2 had a sample standard deviation of 2.98. Assuming $\sigma 1$ and $\sigma 2$ are equal, an estimate for the common population variance would be:
    A) Not in excess of 3
    B) In excess of 3 but not in excess of 5
    C) In excess of 5 but not in excess of 7
    D) In excess of 7 but not in excess of 9
    E) In excess of 9

Chapter 10

16. Error deviations measure distances:
    A) Within groups
    B) Between groups
    C) Both (a) and (b)
    D) None of the above
    E) Between each value and the grand mean

17. If the total sum of squares in a one-way analysis of variance is 25 and the treatment sum of squares is 17, then the error sum of squares is?
    A) 64
    B) 42
    C) 17
    D) 18
    E) 8

18. In a single-factor ANOVA, the computed value of *F* will be zero when
    A) there is no difference in the treatment means.
    B) there is no difference in the block means.
    C) the data are skewed left.
    D) *F* will never be zero.

Chapter 11

Use the following to answer questions 19-23:

The following are the GMAT scores and the GPAs of a random sample of 6 students in a graduate school. This graduate school wants to try to predict GPA based on GMAT score.

GMAT	GPA
610	3.6
470	3.25
590	3.5
520	3.2
410	3.0
750	4.0

19. Compute the value of SSXX:
    A) 71,683.3334
    B) 1,942,100
    C) 3,350
    D) 0.62875
    E) 11,682.5

20. Compute the value of SSXY:
    A) 68,842.5
    B) 71,683.3334
    C) 11,682.50
    D) 208.75
    E) None of the above

21. Compute the estimate for the population slope.
    A) 1.8
    B) 343.39
    C) 0.0029
    D) 332.008
    E) None of the above

22. Compute the correlation coefficient.
    A) 0.78
    B) A negative number
    C) A number very close to zero
    D) 0.09
    E) 0.98

23. Compute the MSE.
    A) 0.005212
    B) 0.0764
    C) 0.023375
    D) 0.0029
    E) None of the above

24. In regression, my estimated slope is equal to -3.2 and the standard deviation of the slope is 0.5 (sample size is large, over 100). Is there statistical evidence of a linear relationship between X and Y? **(Hint: In this question we are given sb1 = 0.5. You need to form the test stat t=b1/sb1=-6.4 which is an extremely small negative value.)**
    A) No evidence
    B) Some evidence
    C) Strong evidence
    D) Can't tell

25. A regression equation is given as: y = 2.5x - 0.85. Compute the predicted value of y when x is 10.
    A) 24.15
    B) 16.5
    C) 1.65
    D) Insufficient information to determine
    E) None of the above

Answer Key

1. B
2. C
3. C
4. C
5. A
6. C
7. C
8. E
9. B
10. E
11. C
12. C
13. D
14. E
15. E
16. A
17. E
18. A
19. A
20. D
21. C
22. E
23. A
24. C
25. A