Quality Exam 1. name:

1. Suppose that an equipment manufacturer guarantees that their machine's mean time between failures is 12 hrs with a standard deviation of 1.5 hours. Once the equipment is delivered, the machine is audited 25 times, obtaining an average of 11 hrs between failures. Using a 95% confidence interval, what can the client conclude?
   A. The machine is meeting the equipment manufacturer's guarantee.
   B. They are more than 95% sure that the machine is underperforming.
   C. We need an F-test before they can make a decision.
   D. They are 100% certain that the machine is underperforming.
   E. Not enough information to make a conclusion.

2. A light bulb company claims that bulbs last an average of 12 months with a standard deviation of 2 months. A recent sample of 100 bulbs had a mean of 11. 2 months. Using 95% confidence, what can the researchers conclude?
   A. They are only 95% sure that the bulbs will last 12 months.
   B. They will reject the 12 month claim.
   C. The can neither accept nor reject Ho
   D. They will accept the 12 month claim.
   E. Not enough information to determine.

3. spaghetti sauce jars are supposed to be filled with 16 ounces of liquid on average. To test this claim, the company randomly selects 25 bottles and finds that the average fill is 15.9 ounces with a standard deviation of 0.75 ounces. What do you conclude?
   A. The average, 15.9, is less than 16 ounces, so we reject the null
   B. Ho is that bottles are okay and there is insufficient evidence to conclude otherwise
   C. Since we can't show otherwise, we assume the equipment is underfilling.
   D. the data allows us to reject that the equipment is operating properly with more than 95% confidence
   E. The 95% confidence interval excludes 16, so we have to accept that the average is 16.

4. Suppose a random sample of n measurements is selected from a population with mean =200 and standard deviation =20. what is the expected mean of the distribution of sample means(XbarBar) for the sample size n=35?
   A. 200
   B. 87
   C. 45
   D. 100
   E. 300

5. 20,000 McDonald's customers were randomly sampled and a 99% confidence interval for the average weekly consumption of hamburgers was constructed. The interval was 7, 8. What is the practical interpretation of this interval?
   A. 99% of all McDonald's customers eat 7-8 burgers per week.
   B. We are 99% confident that the mean consumption of all McDonald's customers falls between 7 and 8.
   C. We are 99% confident that the mean consumption in this sample falls between 7 and 8.
   D. 99% of the sampled McDonald's customers ate between 7 and 8 burgers per week.
   E. The results of this test are inconclusive since we have no idea what the interval means.

6. In EXCEL, Data Analysis Tools disappear from the Tools Menu when you are clicked on
   A. an empty cell
   B. no data is selected to analyze
   C. a graph
   D. a filled cell
   E. too many rows are selected for the specific analysis you want to employ. This is a data error safeguard.

7. We want to estimate the population mean to within a total interval of 100 (+/-50) units with 90% reliability (5% in each tail). The population standard deviation is estimated to be 300 units. What sample size should we use?
   A. 68
   B. 25
   C. 72
   D. 9
   E. 100

8.If alpha is .01 and your calculated P-value is 1. 02
A.reject Ho
B.Accept Ho
C.Conclude P is high and so the result is likely to happen again.
D.alpha 0.01 is too low, use alpha= 0.05
E.This is nonsense. Double check the calculations

9.The purpose of statistical inference is:
A.to find the sample population
B.to develop estimates and test hypotheses about the characteristics of a population using information from the sample
C.provide employment for statisticians
D.to find the population standard deviation.
E.to develop a basis to conduct an F-test

10. In a two-tailed test with 95% confidence interval, what percent of your sample means would fall outside the interval and below the population mean?
A. 2.5
B. 5
C. 1
D. 0.5
E. 10

11.The theorem that enables one to use the normal probability distribution to approximate the sampling distribution of X-bar and probability whenever the sample size is large enough.
A.Distribution theorem
B. Sampling theorem
C.Probability theorem
D.Central limit theorem
E.Pavlovian evolution of midway large numbers

12.A statistician measures average speed of 100 automobiles on route 40, and arrives at a 95% confidence interval for the mean of 65 to 75 miles an hour. What is the probability that the sample mean is included in this 95% confidence interval?
A.0 %
B.100%
C.95%
D.5%
E.it depends on whether you use T or Z curves

13.The mean score of a normally distributed curve of management and organizational behavior students' test scores was 68, with a standard deviation of 6. Ralph got a 54, and he wants to know how many people scored higher than him. What is the Z-score he must use to compute the probability?
A. -1.75
B. 1.75
C. 2.33
D. -2.33
E. 2.1

14.Averaging _____ variance.
A.adds
B.determines and displays
C.reduces or eliminates
D.does not affect
E.disproves

15.what is usually true of a null hypothesis:
A. it is usually designed to be rejected to give evidence for the alternative.
B. even when not rejected, it shouldn't be accepted as true
C. even when rejected, there is some probability it is true
D. all of the above
E.none of the above

16.One hundred beer drinkers from a local bar were randomly sampled and a 99% confidence interval for the average consumption of all beer drinkers was constructed. The interval was 5, 11. Give a practical interpretation of the interval.
A.We are 99% confident that the mean consumption of all beer drinkers falls in the interval 5 to 11.
B.99% of all beer drinker's consumption falls between 5 and 11.
C.We are 99% confident that the mean consumption of the beer drinkers in this sample falls in the interval of 5 and 11.
D.99% of the sampled beer drinker's consumption fell in the interval 5 and 11
E.only 1 percent of the time would this result fail to to occur in repeat testing as long as n>25.

17. If after doing some testing on given sample we found our P value to be .6789 and we had an alpha of 5%, we could conclude that:

A. the probability of getting the null hypothesis is very good.

B. the probability of rejecting the alternative hypothesis is very high.

C. there is sufficient evidence to reject the null hypothesis.

D. there is inadequate evidence to reject the null hypothesis.

E. the chances of this happening again are about 62.89% higher than before the test (ergo post facto)

18. Why would you choose to do a t-test rather than a z-test?

A. it depends on your confidence level

B. comes before z in the alphabet

C. you have too small a probability

D. Always unless n>25

E. whenever mean and standard deviation are estimated from the sample

19. We assume (Ho) an average worker is able to assemble a chair in 15 minutes. Is this substantiated with 95% confidence by the carefully timed assembly of 225 randomly selected chairs whose average assembly time is 15.4 minutes with a standard deviation of 2.4 minutes?

A. no. reject the null hypothesis

B. yes. accept the null hypothesis.

C. no. accept the null hypothesis.

D. yes. reject the null hypothesis

E. we do not have enough info to make a decision

20. Increasing alpha from 5% to 10% will cause

A. a change in the mean

B. increase in the beta .

C. Higher Probability Ho will be rejected

D. change in the observed sample mean

E. cannot be determined

21. If the population mean and standard deviation are NOT known, then we use _____.

A. z-statistic

B. t-statistic

C. f-test

D. alpha

E. T unless n is 25 or more, in which case you must use Z

22. To find the Upper Limit of the confidence interval when using EXCEL descriptive statistics:

A. Subtract the mean from 1.96 * standard error

B. Add the mean to what EXCEL calls the "confidence level"

C. Subtract what EXCEL calls the "confidence level" from the mean

D. Add the mean to the standard deviation

E. Subtract standard deviation from the sample size

23. If the observed mean for a sample is 4.2, the hypothesized mean is 0, the standard deviation is 2, and n=100. What is the T value?

A. 21

B. 2.1

C. -2.1 except excel won't work with negatives

D. 3.3

E. .042

24. How do you determine what confidence level to use in a statistical test?

A. Standard Deviation /P Value

B. T Value / Square root of variance

C. Kurtosis always equals confidence level

D. It is a subjective number depending on needs

E. by taking the square root of the number in the sample and dividing the difference by P / 1.96*Z

25. I want to know if the hours per week that the students in my class study is still 15 (Ho) or if it has changed. Using a confidence interval of 95%, I calculate the p-value for a sample size 30 with a mean of 13.9. The p-value is 0.0019. What conclusion can I draw?

A. reject Ho

B. do not reject Ho

C. reject Ha

D. Accept Ho

E. No conclusion can be drawn from this information.

26. What does the p value mean?

A. The probability of accepting the null hypothesis when it is false.

B. 1 minus the Z score of the test statistic

C. The cut-off region for rejecting the alternate hypothesis

D. The probability of getting the observed test statistic if the null hypothesis is true

E. The probability that we got the test statistic

27.If we do not reject Ho and Ho is true
A.no error has been commited
B.type 1 error has been committed
C.type 2 error has been committed
D.type 3 error has been committed
E.none of the above

28. A fluorescent light tube lasts on average 2000 hours before it has to be replaced. This lifetime is normally distributed with a standard deviation of 100 hours. About how frequently should you relamp (change all the bulbs at once) so that there are likely to be more than 85% of the tubes still working?
A.200 hours
B.300 hours
C.600 hrs because it's 2-tailed
D.1900 hours
E.15 light-years

29. If you observe that t is greater than alpha
A.use a paired t test assuming equal variance
B.reject the null hypothesis
C.accept the null hypothesis
D.this is usually the case. you are comparing the wrong things
E.raise alpha to avoid a type I error

30.A confidence interval
A.Is the time during which you are most sure of yourself.
B. = (1-theta)
C. is less informative than hypothesis testing where Ho is accepted or rejected.
D.that includes zero implies that there is a significant difference between the means of the two tested populations.
E.gives an estimated range of values which is likely to include an unknown population parameter.

31. Probability of an airplane engine failing is a normal distribution function of the number of flight hours since its last overhaul. The mean failure time is 20,000 hours with a standard deviation of 4,000 hours. If you would like less than a 2% chance of breakdown, about how often should you overhaul the engines?
A.16,000
B.400
C.11,800
D.18,000
E.22,000

F.28,400

32.What is the function used in Excel to determine the p-value in a ttest?
A.TINV
B.TDIST
C.STDEV
D.ABS
E.PROBVAL

33.In Analysis of Variance (ANOVA), the null hypothesis is:
A.At least 2 of the means differ from each other
B.all means are different
C.all means are the same
D.the mean is 0
E.this is a trick question. There are no means in ANOVA, there are only variances.

34.Suppose a population is composed of 60% males and 40% females. If 20% have blue eyes and 80% have brown eyes. If these two characteristics are independent, what is the probability an individual selected at random from this population is a brown-eyed female?
A.60%
B.8%
C.32%
D.50%
E.20%

35.Suppose a 95% confidence interval for an estimate of a population mean turns out to be (1,000- 2,100). What does it mean to be "95% confident" in an inference that the true mean is in this interval?
A.In repeated sampling, the population parameter would be between 1000 and 2100 95% of the time.
B.95% of the observations in the entire population fall in this interval.
C.95% of the observations in a sample will always fall in this interval
D.95% of subsequent sample means would fall in this interval.
E.With enough repeated sampling, 95% of the intervals constructed like this would include the population mean, so I'm 95% confident that this one does.