Inferential Statistics Quiz

Total points 25/43

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✓ 1. Normally distributed data are also referred as 1/1

- (●) Bell-shaped ✓
- ( ) Asymmetrical
- ( ) Skewed
- ( ) Peaked

✗ 2. What does a Z score actually calculate ? 0/1

- ( ) Confidence interval
- ( ) Standard score
- (●) Standard error of the mean ✗
- ( ) Variance

Correct answer

- (●) Standard score

✓ 3. A population has a mean of μ=35 and a standard deviation of σ=5. After 3 is added to each data point, what are the new values for the mean and standard deviation? 1/1

- ○ μ=35 and σ=5
- ○ μ=35 and σ=8
- ◉ μ=38 and σ=5 ✓
- ○ μ=38 and σ=8

✓ 4. Of the following Z-score values, which one represents the location closest to the mean? 1/1

- ○ Z=+0.5
- ○ Z=+1.0
- ○ Z=+1.5
- ◉ Z=-0.3 ✓

✗ 5.45 Samples each of size n = 30 are picked randomly from a population one after the other. The population parameters are μ=80 and σ=10. How does the curve of data prepared by calculating mean of each of 45 samples look like ? 0/1

- (●) The sample means form somewhat normal-shaped distribution whether the population is normal or not. ✗
- ( ) The sample means tend to form a normal-shaped distribution only if the population distribution is normal.
- ( ) The sample size of n=30 is too small to predict the shape of the distribution.
- ( ) The mean of each sample will be very close to 80, hence the distribution of means will have little variability.

Correct answer

- (●) The sample means tend to form a normal-shaped distribution only if the population distribution is normal.

✓ 6. The shape of a graph with a normal distribution (equation below) is defined by 1/1

$$y = \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$$

- ( ) the mean and the median
- (●) the mean and the standard deviation ✓
- ( ) the median and the standard deviation
- ( ) the standard deviation alone

✗ 7. Since the population size is always larger than the sample size, then the sample statistic 0/1

- ○ can never be larger than the population parameter
- ○ can never be equal to the population parameter
- ◉ can never be zero ✗
- ○ can never be smaller than the population parameter
- ○ None of the above

Correct answer

- ◉ None of the above

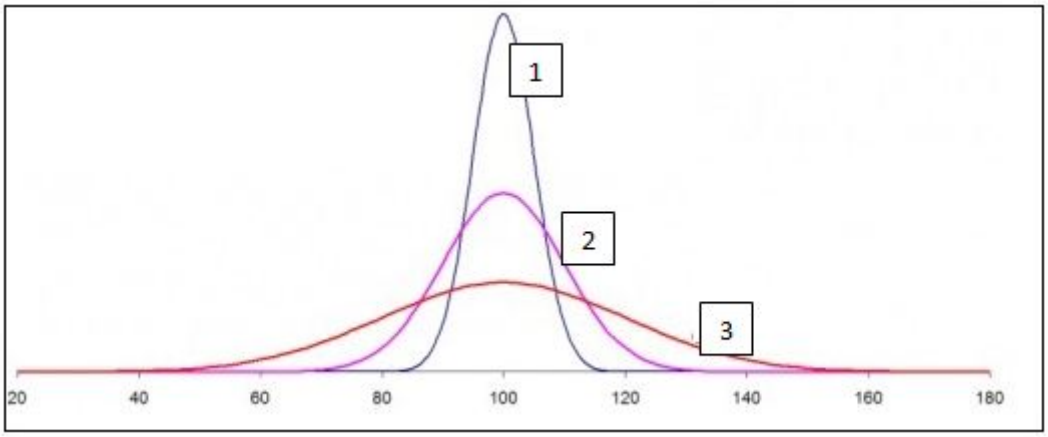
✓ 8. Approximately what percentage of scores fall within one standard deviation of the mean in a normal distribution? 1/1

- ○ 34%
- ○ 95%
- ○ 99%
- ◉ 68% ✓

✓ 9. What type of data do you need for a chi-square test? 1/1

- ○ Interval
- ○ Ratio
- ○ Scales
- ○ Parametric
- ◉ Categorical ✓
- ○ Other

✓ 10. For the below normal distribution, which of the following option holds true ? σ1, σ2 and σ3 represent the standard deviations for curves 1, 2 and 3 respectively. 1/1



- ○ σ1> σ2> σ3
- ◉ σ1< σ2< σ3 ✓
- ○ σ1= σ2= σ3
- ○ None

✓ 11. What is the effect on confidence interval if we increase the sample size ? 1/1

- ○ The confidence interval would increase in size
- ◉ The confidence interval would decrease in size ✓
- ○ The confidence interval is unaffected by sample size
- ○ The confidence interval could either increase or decrease in size

✗ 12. Which of the following is true about a 95% confidence interval of the mean of a given sample: 0/1

- ○ 95 out of 100 confidence intervals will contain the population mean
- ◉ There is a 95% chance that the population mean will fall within the limits of the confidence interval. ✗
- ○ 95 out of 100 population means will fall within the limits of the confidence interval.
- ○ There is a .05 probability that the population mean falls within the limits of the confidence interval.

Correct answer

- ◉ 95 out of 100 confidence intervals will contain the population mean

✗ 13. In Poisson probability distribution, if value of λ is integer then distribution will be 0/1

- ○ Bi model
- ○ Uni model
- ◉ Positive model ✗
- ○ Negative model

Correct answer

- ◉ Bi model

✓ 14. The distribution of heights of American women aged 18 to 24 is approximately normallydistributed with a mean of 65.5 inches and standard deviation of 2.5 inches. Calculate the z-scorefor a woman six feet tall. 1/1

- ○ 6.4
- ○ 2
- ◉ 2.6 ✓
- ○ 3.12

✓ 15. Discrete probability distribution in which outcome is very small with a very small period of time is classified as 1/1

- ○ posterior distribution
- ○ cumulative distribution
- ○ normal distribution
- ◉ Poisson distribution ✓

✗ 16. If number of trials are 8 and probability of success are 0.65 then mean of negative probability distribution is 0/1

- ○ 8.65
- ○ 12.31
- ◉ 5.2 ✗
- ○ 7.35

Correct answer

- ◉ 12.31

✗ 17. A firm's marketing manager believes that total sales for next year will follow normal distribution, with mean of $2.5 million and a standard deviation of $300,000. a. What is the probability(rounded to 2 digits) that the firm's sales will fall within $150000 of the mean? ···/1

0.34 ✗

Correct answer

0.38

✗ 18. In the above question determine the total sales amount that has only a 9% chance of being reached ? ···/1

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Correct answer

2903500

✗ 19. Inferential Statistics is a process that involves all of the following EXCEPT 0/1

- ○ estimating a parameter
- ○ estimating a statistic
- ○ test a hypothesis
- ◉ analyze relationships ✗

Correct answer

- ◉ estimating a statistic

✓ 20. Which of the following statements regarding a researcher's use of inferential statistics is true? 1/1

- ○ It is best to measure every member of a population if possible
- ○ We usually need to take several samples to obtain a good estimate of the population values
- ○ A random sample provides a perfect estimate of the population values.
- ◉ Descriptive statistics from a sample are used to estimate the characteristics of the population. ✓

✓ 21. Which statistical test is used to identify whether there is a relationship between two categorical variables? 1/1

- ○ Student's t-test
- ○ Spearman's correlation test
- ◉ Pearson's Chi-Square test. ✓
- ○ Mann-Whitney test

✓ 22. If you drew all possible samples from some population, calculated the mean for each of the samples, and constructed a line graph based on all of those means, what would you have? 1/1

- ○ A population distribution
- ○ A sample distribution
- ◉ A sampling distribution ✓
- ○ A parameter distribution

✓ 23. When asked questions concerning personal hygiene, people commonly lie. This is an example of. 1/1

- ○ sampling bias
- ○ confounding
- ○ non-response bias
- ◉ response bias ✓

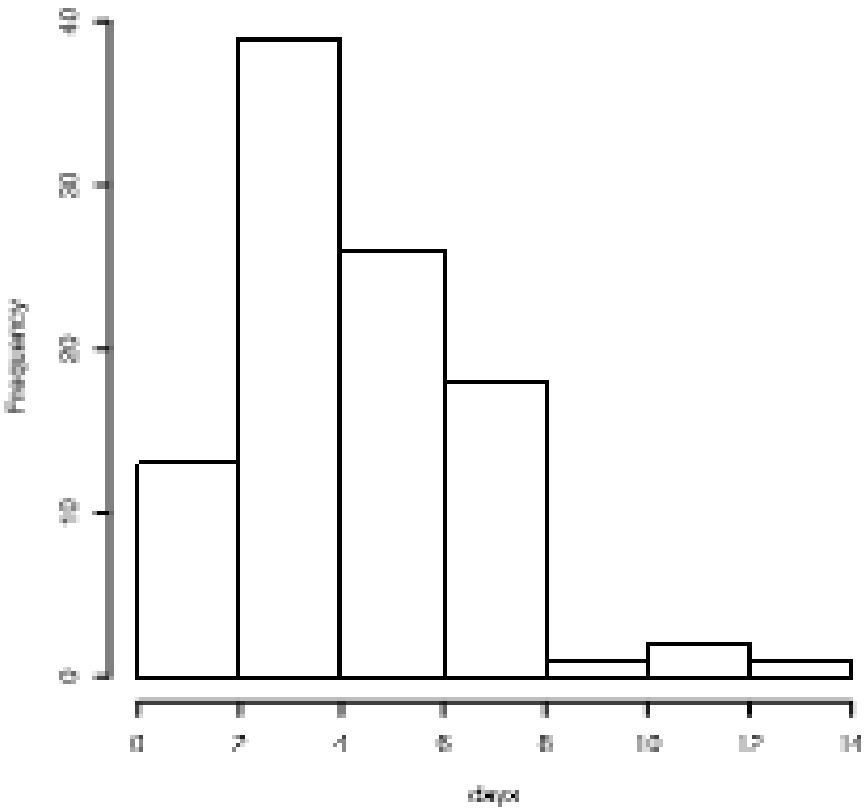
✗ 24. Select the order of sampling schemes from best to worst 0/1

- ○ simple random, stratified , convenience
- ○ simple random, convenience, stratified
- ○ stratified, simple random, convenience
- ◉ stratified, convenience, simple random ✗

Correct answer

- ◉ simple random, stratified , convenience

✓ 25. The histogram below represents the lifespan of a random sample of a particular type of insect. Determine the relationship between the mean and median. 1/1



- ○ mean = median
- ○ mean ≈ median
- ○ mean < median
- ◉ mean > median ✓

✓ 26. Suppose you wanted to apply a one-tailed test as opposed to two-tailed test. The p-value for corresponding alpha = 0.284. How would you convert it for two tailed test ? 1/1

- (●) .284 / 2 = .142 ✓
- ( ) .284 * 2 = .568
- ( ) .284 / 0.05 = 5.68
- ( ) .284 * 0.05 = 0.142

Studies show that listening to music while studying can improve your memory. To demonstrate this, a researcher obtains a sample of 36 college students and gives them a standard memory test while they listen to some background music. Under normal circumstances (without music), the mean score obtained was 25 and standard deviation is 6. The mean score for the sample after the experiment (i.e With music) is 28.

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✗ 27. What is the null hypothesis in this case? 0/1

- (●) Listening to music while studying will not impact memory. ✗
- ( ) Listening to music while studying may worsen memory.
- ( ) Listening to music while studying may improve memory.
- ( ) Listening to music while studying will not improve memory but can make it worse.

Correct answer

- (●) Listening to music while studying will not improve memory but can make it worse.

✓ 28. What would be the Type I error? 1/1

- Concluding that listening to music while studying improves memory, and it's right.
- Concluding that listening to music while studying improves memory when it actually doesn't. ✓
- Concluding that listening to music while studying does not improve memory but it does.

✓ 29. After performing the Z-test, what can we conclude ____ ? 1/1

- Listening to music does not improve memory.
- Listening to music significantly improves memory at p ✓
- The information is insufficient for any conclusion.
- None of the above

✓ 30. How can you deal with low expected values in chi square test? 1/1

- You have to redo your experiment
- You can increase your sample size or combine categories ✓
- You can transform your data
- You can add more of the same number
- None of these
- You can exclude outliers

✓ 31. What would a chi-square significance value of P > 0.05 suggest? 1/1

- That there is no significant difference between the sample and the population
- That there is a significant relationship between the sample and the population
- That there is a significant difference between the sample and the population
- That there is a significant relationship between categorical variables ✓
- That there is no significant difference between feature "time 1" and feature "time 2"
- That there is no significant difference between categories

✓ 32. Failing to reject the null hypothesis when it is false is : 1/1

- alpha
- Type I error
- beta
- Type II error ✓

✓ 33.The maximum probability of Type I error that the decision maker will tolerate is called the 1/1

- Level of significance ✓
- Critical Value
- Decision Value
- Probability Value

✗ 34. ANOVA was used to test the outcomes of three drug treatments. Each drug was given to 20 individuals. The MSE for this analysis was 16. What is the standard deviation for all 60 individuals sampled for this study? 0/1

- (●) 6.928 ✗
- ( ) 48
- ( ) 16
- ( ) 4

Correct answer

- (●) 4

✗ 35. Which of the following is an assumption of one-way ANOVA comparing samples from three or more experimental treatments? 0/1

- (●) All the response variables within the K populations follow a normal distribution ✗
- ( ) The samples associated with each population are randomly selected and are independent
- ( ) The response variable within each of the k populations have equal variances.
- ( ) All of the above

Correct answer

- (●) All of the above

✓ 36. The standard deviation and coefficient of variation of a set of observations are 5.2 and 10.4%, respectively. If each observation is increased by 2, then the coefficient of variation of new observations is 1/1

- (●) 10% ✓
- ( ) 20%
- ( ) 12.4%
- ( ) 10.4%

✓ 37. The scores (out of 100) of students appearing for a competitive examination are approximately normally distributed with a mean 50 and a standard deviation of 10. How high must a student score in the examination to be in the top 5 percentile? It is given that $P(Z < 1.645) = 0.95$. A. 66.45 B. 95.00 C. 51.645 D. 69.6 1/1

- (●) 66.45 ✓
- ( ) 95.0
- ( ) 51.645
- ( ) 69.6

✗ 38. A research report summarizes the result of a t-test by stating : t(35) = 5.2, p < 0.05. Which of the following is a correct interpretation of this report? 0/1

- (●) The H0 was not rejected and the probability of a Type I error is less than .05. ✗
- ( ) The H0 was not rejected and the probability of a Type II error is less than .05.
- ( ) The H0 was rejected and the probability of a Type I error is less than .05.
- ( ) The H0 was rejected and the probability of a Type II error is less than .05.

Correct answer

- (●) The H0 was rejected and the probability of a Type I error is less than .05.

✗ 39. When the p-value is high , this means there is a strong evidence against the null hypothesis 0/1

- (●) True ✗
- ( ) False

Correct answer

- (●) False

✗ 40. Suppose the correlation between height and weight for adults is +0.80. What proportion of the variability in weight can be explained by the relationship with height? 0/1

- ○ 20%
- ○ 36%
- ○ 64%
- ◉ 80% ✗

Correct answer

- ◉ 64%

Feedback

*Explained variance is given by r**2, in this case it's 0.8 ** 2*

✗ 41. What does the statistic Cramer's V indicate? 0/1

- ◉ The significance of the Chi-square test. ✗
- ○ The expected frequencies in a contingency table.
- ○ The amount of common variability of two numeric variables.
- ○ The strength of association between two categorical variables..

Correct answer

- ◉ The strength of association between two categorical variables..

✗ 42. How does the shape of t-distribution compare to normal distribution? 0/1

- ○ The t distribution is taller and less spread out, especially when n is large.
- ◉ The t distribution is taller and less spread out, especially when n is small. ✗
- ○ The t distribution is flatter and more spread out, especially when n is large.
- ○ The t distribution is flatter and more spread out, especially when n is small.

Correct answer

- ◉ The t distribution is flatter and more spread out, especially when n is small.

✓ 43. Which of the following assumptions are required if an independent t-test is to be used? 1/1

- ○ dependent variable should be normally distributed
- ○ Variances of dependent variables would be equal
- ○ The dependent variable would be on a continous scale
- ◉ All the above assumptions (A, B and C) are required. ✓