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Fall 2002 Section: W 8, W 12, W 4, F 3

Psy 207: Psychological Statistics

Exam 2 Form A

Circle in your **Name** (Surname First) **and Student Number** (at Identification Number; start at left and leave no spaces) **on the Answer Sheet**. Circle in the **1** for **Form A** under "Grade or Education." Write your recitation time on the top of the Answer Sheet. **Also write your name and circle your recitation time on this booklet**. This booklet and the Answer sheet are to be turned in. There is one best answer per question. If you don't know the answer, it is better to guess than to leave it blank, as your grade is based on the total number correct.

1. In testing a null hypothesis, the researcher directly evaluates: A) which of two populations the test statistic comes from; B) whether it is more likely that the test statistic comes from the H_0 distribution than the H_1 distribution; C) whether the test statistic could reasonably come from the H_0 distribution; D) whether a Type I or a Type II error is more likely; E) A and B are both correct.
2. In sampling distributions of the mean, as the size of the samples goes up: A) the standard error of the mean more closely approximates the standard deviation of the population. B) the expected value of the sample means, $E(\overline{X})$, gets larger; C) $E(\overline{X})$ gets smaller; D) the relative density of the scores around μ goes down; E) the relative density of the scores around μ goes up.
3. Dr. Rosen used 50 subjects in her experiment and Dr. Kim used 15 in an experiment which was essentially the same except for number of subjects. Both researchers set α =.05. A) Rosen is more likely to make a Type I error; B) Kim is more likely to make a Type I error; C) they both have equal likelihood of making a Type I error. D) Not enough information to estimate.
4. Dr. Yukawa used 85 subjects in her experiment and Dr. Thomas used 22 in an experiment which was essentially the same except for number of subjects. Both researchers set α =.05. A) Yukawa is more likely to make a Type II error; B) Thomas is more likely to make a Type II error; C) They both have equal likelihood of making a Type II error. D) not enough information to estimate.
5. If the null hypothesis is true and you run a t-test using the .05 level of significance, what is the probability that you will make a Type I error? A) .05; B) .95; C) 0; D) somewhere between 0 and .05. E) Not enough information to answer.
6. If the null hypothesis is false and you run a t-test using the .05 level of significance, what is the probability that you will make a Type I error? A) .05; B) .95; C) 0; D) somewhere between 0 and .05. E) Not enough information to answer.
7. If 400 t-tests are run and H_0 is <u>always true</u>, at an α of .05 and a β of .30, about how many <u>Type I</u> errors would be made? A) 120; B) 30; C) 5; D) 20; E). 0
8. If 400 t-tests are run and H_0 is <u>always true</u>, at an α of .05 and a β of .30, about how many <u>Type II</u> errors would be made? A) 5; B) 0; C) 20; D) 120; E). 30
9. If 400 t-tests are run and H_0 is <u>true 25% of the time</u>, with α set at .05 and β is at .30, about how many <u>Type I</u> errors would be made? A) 20; B) 30; C) 5; D) 90; E). 0.

10. If 400 t-tests are run and H_0 is true 25% of the time, with α set at .05 and β is at .30, about how many Type II errors would be made?
A) 90; B) 20; C) 5; D) 30; E). 120

11. If you designed a reasonable experiment and set α = .05, what is the probability that you would make a Type I error in the experiment? A) .05; B) .95; C) 0;
D) between 0 and .05. E) Not enough information to answer.

12. As the size of the samples gets larger, the probability of making a Type I error:
A) gets larger; B) gets smaller; C) stays the same; D) not enough information to answer.

13. As the size of the samples gets larger, the probability of making a Type II error:
A) gets larger; B) gets smaller; C) stays the same; D) not enough information to answer.

**********Use for the next 3 Questions**********

Assume that a standardized 4th grade test in reading has μ = 150 and σ = 25. Mr. Suh, a 4th grade teacher, used a new method to teach reading in his class of 16 students. He ran a statistical test to see if his class performed significantly better than the standardized group. The mean score on the reading test in his class was 168.

14. At α =.05 in a one-tailed test, what is the critical value of the statistical test does Mr. Suh need to conclude his class did significantly better than the standardized group?
A) 1.64; B) 1.75; C) 1.96 D) 2.14; E) 2.60.

15. What was the value of the test statistic as computed by Mr. Suh?
A) 2.88; B) .75; C) 3.27; D) 1.16 E) 8.24

16. Mr. Suh computed 'd,' Effect Size Index, to get some idea of how successful his method is. d = : A) 1.57; B) 1.21; C) 4.55; D).72; E) .22.

**********Use for the next three Questions**********

Assume that a random group of 750 people were asked whether they would vote in the next election and 420 said they would. If there were no changes in behavior between the poll and the election and everyone told the truth:

17. What is the best point estimate of the proportion of people who would vote in the next election? A) .56; B) .50; C) .42; D) .80; E) 25.

18. What is the best estimate of standard error of the proportion of people who would vote in the next election?
A) .05; B) .0181 C) .023; D) .0375; E) .138.

19. The 95% confidence interval for the proportion of people who vote would be what interval? A) .45 - .61; B) .40 - .44; C) 37 - .47; D) .49 - .63; E) .52 - .60 ..

**********Use for next 5 Questions **********

A researcher wanted to know how many chocolate chip cookies boys would eat with lunch if they were freely available. The data from a mall lunchroom for a random sample of six boys was as follows: 5, 6, 9, 6, 10, 8.

20. What is the best point estimate of the mean number of cookies boys would eat?
A) 7.33; B) 7.625; C) 8.85; D) 6.88; E) 8.35.

21. What is the sample standard deviation?
A) 6169.5; B) 4594.8; C) 2256.8; D) 1.97; E) 2843.5

22. What is the estimated standard error of the mean?
A) 7.13; B) 20.15; C) 15.52; D) 2.67; E) .80.

23. What value of t would we use to compute the 95% confidence interval for the population mean?
A) 1.96; B) 2.306; C) 3.499; D) 2.571; E) 2.447.

24. What is the 95% confidence interval for the population mean? A) 63.22-91.80; B) 73.17-78.33; C) 5.27-9.40; D) 68.15-84.76; E) 74.25- 83.91.

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25. What change would make the size of the confidence interval larger? A) Increasing n, the size of the random sample; B) Decreasing the standard deviation of the population; C) Increasing the value of μ, the population mean; D) Changing the interval from 95% to 99% confidence; E) All of these

26. When running an experiment, what will lower the probability of making a Type II error?
A) Increasing sample size; B) Increasing alpha level;
C) Increasing the difference between the means of the treatment groups.
D) Decreasing within group variability; E) All of the above.

**********Use for the following 7 questions**********

Dr Gallagher thought that math aptitude can be learned. She took a random sample of 15 students from his elementary school and gave them several lessons in mathematical reasoning. Everyone took the same aptitude test. The school mean, μ = 78. The 15 student sample taught by Gallagher had the following results, $\overline{X} = 82,$ and $s = 7.8$. Gallagher evaluated these data using hypothesis testing logic, a two-tailed test, and α = .05.

27. The null hypothesis, H_0, that Gallagher used was most likely: A) $\overline{X}$ is higher than $\mu_0 = 78$ B) $\overline{X}$ is the mean of a random sample from a population with. $\mu_1 = 82$.
C) $\overline{X}$ is the mean of a random sample from a population with $\mu_0 = 78$ D) $\overline{X}$ is the mean of a random sample from a population with $\mu_1 > 78$ E) Any of these.

28. The Alternate hypothesis H_1 in this study is: A) $\overline{X}$ is higher than $\mu_0 = 78$
B) $\overline{X}$ comes from a population with. $\mu_1 = 82$. C) $\overline{X}$ is a random sample from a population with $\mu_1 > 78$ D) $\overline{X}$ is a random sample from a population with $\mu_1 \neq 78$
E) Any of these.

29. In her analysis what is the critical value that Dr Gallagher should use? A) 2.131;
B) 1.761 C) 1.960 D) 1.645 E) 2.145

30. The standard error of the sampling distribution of means was what? $s_{\overline{X}} =$:
A) 7.8 B) 2.01 C) .542 D) 6.15 E) 3.34.

31. Dr Gallagher should use what value from the data to compare against the critical value?
A) 2.77 B) 2.61; C) .98 D) 4.76; E) 1.99

32. What can Dr Gallagher conclude from this analysis? A) H_0 is true; B) accept H_0;
C) H_1 is true; D) reject H_0; E) The results are too close to call.

33. If an error was made in this study, it would have been: A) a type I error. B) a type II error. C) No error could have been made if the statistics were analyzed correctly.
D) there is not enough data to decide which kind of error might have been made. it could have been either a type I or a type II error.

Key: CECBA CDBCA DCBAA DABEA DEDCD ECDEB EBB