EDUR 8131

Sample Test 1 (Covers material through one-sample t-test)

1. Describe the following terms as simply as possible in your own words (quotations from other materials will not receive credit):

   a. p-value for a one sample z-test
   b. Type 1 error
   c. Power

2. Identify each of the following as either qualitative or quantitative variables:

   a. Number of pets in the family
   b. County of residence

3. Indicate whether the following are nominal, ordinal, interval, or ratio variables:

   a. Jill had the second highest score
   b. Jacob's major is psychology

4. Explain why the mean is appropriate or inappropriate as a measure of central tendency for nominal data.

5. Below is a frequency distribution. Find the mean, median, mode, SD, Range, and sample size for these scores:

X	Freq
15	1
14	3
13	1
12	2
10	2

6. Write a directional, non-directional, and null hypothesis for the following variables: IV is grade retention (retained vs. not retained) and DV is degree of alienation a student feels. You must label which hypotheses are directional, non-directional, and null to receive credit.

7. Write a directional, non-directional, and null hypothesis for the following variables: IV is attitude toward school (steps of attitude are strongly negative, negative, neutral, positive, and strongly positive) and DV is amount of financial contribution to school. You must label which hypotheses are directional, non-directional, and null to receive credit.

8. What limiting factor prevents use of a one-sample z test in practice?

9. A percentile rank of 33 indicates what?

10. If there are 14 females and 6 males in a classroom, what is the probability (not percent) of selecting a female at random?

11. In a class most students did poorly on a test, but a few did very well. The distribution of scores from this test is likely to follow which shape?

12. What proportion of scores lie between z scores of -1 and 1 (assuming data were drawn from a normal distribution)?

13. Health experts argue that the average caloric intact for adult males should be about 2,000 calories per day. Is there any evidence that the sample of male graduate students from GSU differ, on average, from this recommendation? Below is the daily caloric intake for a sample of GSU students. Assume $\sigma = 1500$.

2560, 3345, 5966, 1568, 3687, 2985, 2159, 2358, 4596, 4416

14. Test grades in a class demonstrated M = 77.9 and SD = 11.83. Find the raw scores for students with these z-scores:

(a) 1.13
(b) -2.25
(c) 0.00
(d) 0.12

15. What is the percentile rank for someone with a caloric intact of 3687 within this sample of students:

2560, 3345, 5966, 1568, 3687, 2985, 2159, 2358, 4596, 4416

ANSWERS

1. Describe the following terms as simply as possible in your own words (quotations from other materials will not receive credit):

a. p-value for a one sample z-test

Probability of obtaining, by chance, a z-ratio this large or larger, in absolute value, if the null hypothesis (i.e., H_0: μ = insert appropriate value here) is true.

b. Type 1 error

Incorrectly rejecting a true null.

c. Power

Probability of rejecting a false null.

2. Identify each of the following as either qualitative or quantitative variables:

a. Number of pets in the family

Quant.

b. County of residence

Qual.

3. Indicate whether the following are nominal, ordinal, interval, or ratio variables:

a. Jill had the second highest score

Ordinal

b. Jacob's major is psychology

Nominal

4. Explain why the mean is appropriate or inappropriate as a measure of central tendency for nominal data.

Mean is inappropriate as measure of central tendency for nominal data because mean assumes categories of variable are ranked and have equal intervals. For nominal data, one should use mode rather than mean.

5. Below is a frequency distribution. Find the mean, median, mode, SD, Range, and sample size for these scores:

X	Freq
15	1
14	3
13	1
12	2
10	2

Scores from this frequency distribution are:

15, 14, 14, 14, 13, 12, 12, 10, and 10

Mean = 12.667
Median = 13
Mode = 14
SD = 1.803
Range = 5
N = 9

6. Write a directional, non-directional, and null hypothesis for the following variables: IV is grade retention (retained vs. not retained) and DV is degree of alienation a student feels. You must label which hypotheses are directional, non-directional, and null to receive credit.

Directional: Retained students will have higher degree of alienation than non-retained students.

Non-directional: Retained and non-retained students will experience differing degrees of alienation (or There will be a difference in degree of alienation displayed by retained and non-retained students).

Null: There will be no difference in degree of alienation displayed by retained and non-retained students.

7. Write a directional, non-directional, and null hypothesis for the following variables: IV is attitude toward school (steps of attitude are strongly negative, negative, neutral, positive, and strongly positive) and DV is amount of financial contribution to school. You must label which hypotheses are directional, non-directional, and null to receive credit.

Directional: There will be a positive relationship between attitude toward school and amount of financial contribution.

Non-directional: There will be a relationship between attitude toward school and amount of financial contribution.

Null: There will be no relationship between attitude toward school and amount of financial contribution.

8. What limiting factor prevents use of a one-sample z test in practice?

The z test requires knowledge of the population standard deviation (σ). This value is rarely known except for some large scale testing situations (e.g., IQ scores, SAT, GRE, ITBS, etc.). For most applications σ is not known and must be estimated by s. This precludes use of one sample z test.

9. A percentile rank of 33 indicates what?

PR of 33 indicates that the obtained score is higher than or equal to 33% of all scores in the distribution from which the score is drawn.

10. If there are 14 females and 6 males in a classroom, what is the probability (not percent) of selecting a female at random?

14/20 = .7

11. In a class most students did poorly on a test, but a few did very well. The distribution of scores from this test is likely to follow which shape?

Positive skew.

12. What proportion of scores lie between z scores of -1 and 1 (assuming data were drawn from a normal distribution)?

.6826

13. Health experts argue that the average caloric intact for adult males should be about 2,000 calories per day. Is there any evidence that the sample of male graduate students from GSU differ, on average, from this recommendation? Below is the daily caloric intake for a sample of GSU students. Assume $\sigma = 1500$.

2560, 3345, 5966, 1568, 3687, 2985, 2159, 2358, 4596, 4416

Comparison value for this study is H_0: $\mu = 2,000$:

Caloric intake for GSU male graduate students in this study demonstrated a statistically significant mean difference from the recommended standard of 2,000 calories per day at the .05 level of significance (M = 3364.00, SD = 1332.47, 95% CI = 2434.29 to 4293.71, n = 10, $\underline{z}$ = 2.876, $\underline{p}$ = .004). Results show that study participants have an average caloric intake that is greater than the standard of 2,000 calories.

14. Test grades in a class demonstrated M = 77.9 and SD = 11.83. Find the raw scores for students with these z-scores:

(a) 1.13

1.13(11.83) + 77.9 = 91.27

(b) -2.25

-2.25(11.83) + 77.9 = 51.28

(c) 0.00

0.00(11.83) + 77.9 = 77.9

(d) 0.12

0.12(11.83) + 77.9 = 79.32

15. What is the percentile rank for someone with a caloric intact of 3687 within this sample students:

2560, 3345, 5966, 1568, 3687, 2985, 2159, 2358, 4596, 4416

PR = 70