

SOCI 102 - EXAM 2**Multiple Choice**

Identify the choice that best completes the statement or answers the question.

1. Of the following z-score values, which one represents the location closest to the mean?
 - a. $z = +0.50$
 - b. $z = +1.00$
 - c. $z = -1.00$
 - d. $z = -2.00$
2. For a population with $\mu = 80$ and $\sigma = 10$, what is the z-score corresponding to $Y = 70$?
 - a. -10
 - b. -1.00
 - c. $+1.00$
 - d. $+10$
3. For a population with $\mu = 60$ and $\sigma = 8$, what is the Y value corresponding to $z = -0.50$?
 - a. -4
 - b. 56
 - c. 64
 - d. 59.5
4. Last week Sarah had exams in Math and in Spanish. On the Math exam, the mean was $\mu = 30$ with $\sigma = 5$, and Sarah had a score of $Y = 45$. On the Spanish exam, the mean was $\mu = 60$ with $\sigma = 6$ and Sarah had a score of $Y = 65$. For which class should Sarah expect the better grade?
 - a. Math
 - b. Spanish
 - c. The grades should be the same because the two exam scores are in the same location.
 - d. There is not enough information to determine which is the better grade.
5. An introductory psychology class has 9 freshman males, 15 freshman females, 8 sophomore males, and 12 sophomore females. What is the probability of randomly selecting a male from this group?
 - a. $9/24$
 - b. $8/20$
 - c. $17/20$
 - d. $17/44$
6. What proportion of a normal distribution is located in the tail beyond a z-score of $z = -1.50$?
 - a. -0.0668
 - b. -0.9332
 - c. 0.0668
 - d. 0.9332
7. For a normal distribution, what z-score value separates the lowest 20% of the distribution from the highest 80%?
 - a. $z = 0.20$
 - b. $z = 0.80$
 - c. $z = 0.84$
 - d. $z = -0.84$

8. A normal distribution has a mean of $\mu = 24$ with $\sigma = 3$. What score is needed to place in the top 14% of the distribution?
 - a. 20.76
 - b. 27.24
 - c. 25.08
 - d. 24.42
9. The standard deviation of the distribution of sample means is called _____.
 - a. the expected value of \bar{Y}
 - b. the standard error of \bar{Y}
 - c. the sample mean
 - d. the central limit mean
10. Which of the following would produce a standard error of 3 points?
 - a. $N = 4$ scores from a population with $\sigma = 6$
 - b. $N = 9$ scores from a population with $\sigma = 9$
 - c. $N = 16$ scores from a population with $\sigma = 12$
 - d. All three samples would produce a standard error of 3 points.
11. A sample of $N = 25$ scores is determined to have a standard error of 2 points. What is the standard deviation for the population from which the sample was obtained?
 - a. 2
 - b. $2/5$
 - c. 10
 - d. 50
12. If sample size (N) is held constant, the standard error will _____ as the population variance increases.
 - a. increase
 - b. decrease
 - c. stay constant
 - d. cannot answer with the information given
13. The critical region for a hypothesis test consists of _____.
 - a. outcomes that have a very low probability if the null hypothesis is true
 - b. outcomes that have a high probability if the null hypothesis is true
 - c. outcomes that have a very low probability whether or not the null hypothesis is true
 - d. outcomes that have a high probability whether or not the null hypothesis is true
14. In general, increasing the alpha level (for example from .01 to .05) will _____.
 - a. increase the likelihood of rejecting the null hypothesis
 - b. decrease the likelihood of rejecting the null hypothesis
 - c. increase the standard error
 - d. decrease the standard error
15. In a hypothesis test, an extreme z-score value, like $z = +3$ or $z = +4$, _____.
 - a. is probably in the critical region
 - b. means that you should probably reject the null hypothesis
 - c. is strong evidence of a statistically significant effect
 - d. All of the other options are correct.
16. A Type I error means that a researcher has _____.
 - a. falsely concluded that a treatment has an effect
 - b. correctly concluded that a treatment has no effect
 - c. falsely concluded that a treatment has no effect
 - d. correctly concluded that a treatment has an effect

17. If a treatment has a very small effect, then a hypothesis test evaluating the treatment effect is likely to _____.
a. result in a Type I error
b. result in a Type II error
c. correctly reject the null hypothesis
d. correctly fail to reject the null hypothesis
18. A population is known to have a mean of $\mu = 45$. If a researcher predicts that the experimental treatment will produce a *decrease* in the population mean, then the null hypothesis for a one-tailed test would state _____.
a. $\mu \geq 45$
b. $\mu \leq 45$
c. $\bar{Y} \leq 45$
d. $\bar{Y} \geq 45$

Short Answer

19. For a population with $\mu = 70$ and $\sigma = 8$, find the z-score that corresponds to each of the following Y values.

Y = 74
Y = 68
Y = 78
Y = 70
20. A normal distribution has a mean of $\mu = 28$ with $\sigma = 5$. Find the scores associated with the following regions:
a. the score needed to be in the top 41% of the distribution
b. the score needed to be in the top 72% of the distribution
c. the scores that mark off the middle 60% of the distribution
21. A normal distribution has $\mu = 40$ and $\sigma = 8$.
a. Describe the distribution of sample means based on samples of $N = 16$ selected from this population.
b. Of all the possible samples of $N = 16$, what proportion will have sample means greater than 42?
c. Of all the possible samples of $N = 16$, what proportion will have sample means less than 39?
22. A study examines self-esteem and depression in children. A sample of 25 children with low self-esteem is given a standardized test for depression. The average score for the group is $\bar{Y} = 93.3$. For the general population, scores on the depression test form a normal distribution with a mean of $\mu = 90$ and a standard deviation of $\sigma = 15$. Do children with low self-esteem show significantly more depression? Use a one-tailed test with $\alpha = .05$.