



Republic of the Philippines
Department of Education

CARAGA REGION
SCHOOLS DIVISION OF SURIGAO DEL NORTE

STATISTICS AND PROBABILITY
MIDTERM, SECOND SEMESTER

Name: _____ Date: _____

Grade Level and Section: _____

DIRECTIONS: Read the question carefully. Choose and encircle the correct answer.

1. It is a variable being measured to produce numerical observations associated with the random outcomes of a chance experiment.
A. fixed variable
B. dependent variable
C. independent variable
D. random variable
2. Which of the following is a discrete random variable?
A. the number of patients in a hospital
B. the average weight of female athletes
C. the average amount of electricity consumed
D. the amount of paint used in repainting a building
3. What are the possible values of a random variable when a coin is tossed once?
A. Tail (T) and Head (H)
B. The number of dots 1,2,3,4,5,6
C. Tail and Tail (TT), and Head and Head (HH)
D. The pair of even number of dots (2,2),(2,4),(2,6),(4,2),(4,4),(4,6),(6,2),(6,4) and (6,6)
4. Which is a discrete probability distribution?

X	3	4	5
P(X)	0.4 0	0.10	0.5

X	1	2	3	4
P(X)	1/5	3/10	1/5	3/10



A.

B.

X	1	2	3	4
P(X)	0.15	0.35	0.40	0.5
X	0	2	4	6
P(X)	1/5	1/5	2/5	1/5

C.

D.

5. A fair coin is tossed three times and the sequence of heads (H) and tails (T) is observed. What is the probability that no heads will appear?

A. $1/8$
B. $3/8$
C. $5/8$
D. $2/3$

6. The expected value of a random variable is the

A. largest value that will ever occur.
B. mean value over an infinite number of observations of the variable.
C. most common value over an infinite number of observations of the variable.
D. value that has the highest probability of occurring.

For items 7-10.

Cardo sells a maximum of 3 tickets per customer. Let T be the number of tickets sold to a random customer. Below is the probability distribution of T.

T	0	1	2	3
---	---	---	---	---



P(T)	0.20	?	0.40	0.23
------	------	---	------	------

7. Which probability value would satisfy the given probability distribution?
 - A. 0.16
 - B. 0.17
 - C. 0.18
 - D. 0.19
8. What is the mean and variance of the probability distribution?
 - A. 1.64
 - B. 1.65
 - C. 1.66
 - D. 1.67
9. What is the variance of the probability distribution?
 - A. 2.18
 - B. 2.19
 - C. 2.20
 - D. 2.21
10. What would be the best interpretation you can create given the mean of the probability distribution?
 - A. Most customers will purchase 3 tickets.
 - B. Cardo can expect to have more tickets sold.
 - C. A group of 10 customers will purchase exactly 29 tickets.
 - D. If we look at a large number of customers, then each customer, on the average, will have purchased about 1.66 tickets.
11. What is the first step in finding the variance of a discrete probability distribution?
 - A. Calculate the standard deviation
 - B. Find the mean of the probability distribution
 - C. Subtract the mean from each value of the random variable X
 - D. Multiply the square of the difference of X and the mean by each value of the random variable.
12. Which statement is NOT true about the variance of a discrete random variable?
 - A. Variance is always nonnegative.
 - B. It tells the average of the items in a discrete probability distribution
 - C. It measures how far apart the elements of the set are spread out
 - D. High variance indicates that the data points are very spread out around the mean.
13. A local club plans to invest P10,000 to host a basketball game. They expect to sell tickets worth P15,000. But if it rains on the day of the game, they won't sell any tickets, and the club will lose all the money invested. If the weather forecast for the day of the game is 20% possibility of rain, is this a good investment?
 - A. No because the expected value is positive P2,000
 - B. No because the expected value is negative P2,000
 - C. Yes because the expected value is positive P2,000
 - D. Yes because the expected value is negative P2,000
14. Which of the following is NOT a property of a normal curve?
 - A. The total area under it is 1.
 - B. The curve is symmetric about the center.
 - C. It is divided into positive 2 and negative 2 standard deviations
 - D. The mean, median, and mode have the same value and are located at the same point.



15. The area under the part of normal curve in the standard normal distribution that lies within 2 standard deviations of the mean is
- 68%
 - 95%
 - 99.7%
 - 100%
16. A set of Mathematics exam scores has a mean of 68 and a standard deviation of 8. A set of English exam scores has a mean of 75 and a standard deviation of 10. For which exam would a score of 78 have a higher standing?
- Math
 - English
 - both Math & English
 - cannot be determined
17. What is " $P(a < x < b)$ "?
- The area to the left of a.
 - The area to the right of a.
 - The area between a and b.
 - The area to the right of b.
18. Evaluate the score of the student in a biology test where the equivalent z-score is 0.98. The mean of the test was 88 with a standard deviation of 9.5.
- 95
 - 96
 - 97
 - 98
19. The midterm examination scores in Statistics and Probability follows a normal distribution with mean of 38 and a standard deviation of 2. If Felix is included in the top 5%, what minimum score should Felix have?
- 40
 - 41
 - 42
 - 43
20. Which of the following illustrates a systematic sampling method?
- A researcher conducted a survey of 50 randomly selected workers from each of these categories: high school graduate, with undergraduate degrees, with master's degree, and with doctoral degree.
 - A researcher interviewed all freshmen in each of 15 randomly selected public schools in Surigao del Norte.
 - A researcher doing a research work on students' reaction of the newly implemented curriculum and interviewed every 10th student entering the gate.
 - A researcher selected a sample of $n = 120$ from a population 850 using the Table of Random Numbers.
21. A randomly selected sample of 400 students at a university with 15-week semesters was asked whether or not they think the semester should be shortened to 14 weeks (with longer classes). Forty-six percent (46%) of the 400 students surveyed answered "yes." Which one of the following statements about the number 46% is correct?
- It is a sample statistic
 - It is a random variable
 - It is a population parameter
 - It is a quantitative discrete variable
22. What do you call a portion or representative of population?
- Parameter



- B. Population
 - C. Sample
 - D. Statistic
23. A randomly selected 400 students out of 9000 students at a university with 15-week semesters was asked whether or not they think the semester should be shortened to 14 weeks (with longer classes). Forty-six percent (46%) of the 400 students surveyed answered "yes." What is the sample?
- A. 400 students
 - B. 9000 students
 - C. 15-week semesters
 - D. 46% who answered "yes"
24. Which of following is true about the mean of the sample means?
- A. The mean of the sample mean is equal to the population mean.
 - B. The mean of the sample mean is equal to the population mean divided by the population variance.
 - C. The mean of the sample mean is equal to the square of population mean.
 - D. The mean of the sample mean is equal to the square root of population mean.
- For items 25-26. Below are the scores of 8 Grade 11 students in Statistics quiz.
- 7, 8, 12, 15, 10, 11, 9, 14
25. What is the mean of the sample means of size 3?
- A. 9.50
 - B. 9.75
 - C. 10.50
 - D. 10.75
26. What is the variance of the sample means of size 3 if the population variance is 6.9375?
- A. 1.5
 - B. 1.6
 - C. 1.7
 - D. 1.8
27. What is true about the standard error of the mean?
- A. Decreases as the sample size increases.
 - B. It is less than the standard deviation of the population.
 - C. It measures the variability of the mean from sample to sample.
 - D. All of the above
28. What distribution is used to estimate population parameters when the population variance is unknown, and the sample size is less than 30?
- A. Chi-square Distribution
 - B. Pearson Correlation Coefficient
 - C. t-Distribution
 - D. z-Distribution
29. Given $\mu = 10$, $\sigma = 3$ and $n = 40$. Which of the following distribution of the sample mean for a normal population when the population variance is known?
- A. Chi-square Distribution
 - B. Pearson Correlation Coefficient
 - C. t-Distribution
 - D. z-Distribution
30. A History teacher claims that the average height of Filipino males is 163 centimeters. A student taking up Statistics randomly select 10 Filipino males and measure their heights. Their heights in centimeter are 163, 167, 159, 165, 162, 164, 163, 160, 169 and 174. To test the claim, which test is appropriate?



- A. chi-square test
 - B. f-test
 - C. t-test
 - D. z-test
31. Which of the following states that the sampling distribution of the sample means approaches a normal distribution as the sample size gets larger?
- A. Central Limit Theorem
 - B. Law of Large Numbers
 - C. Limit Theorem
 - D. Bayes Theorem
32. What happens to the histogram of the sample means of the random samples in Central Limit Theorem, as $n \rightarrow \infty$?
- A. It changes nothing from the original population.
 - B. It shows the variance of the distribution.
 - C. It shows the standard deviation of the distribution.
 - D. It approaches the normalcy of the distribution.
33. The record of weights of the male population follows the normal distribution. Its mean and standard deviation are 70 kg and 15 kg respectively. If a researcher considers the records of 50 males, what would be its standard deviation?
- A. 2.11
 - B. 2.12
 - C. 2.13
 - D. 2.14
34. Which concept of random sampling distribution of the sample means using Central Limit Theorem?
- A. If you have a population mean μ and standard deviation σ and take sufficiently large random samples from the population with replacement, then the distribution of the sample means will be approximately distributed normally.
 - B. The probability of the simultaneous occurrence of two events that are independent is given by the product of their individual probabilities.
 - C. If you have a population mean μ and standard deviation σ and take sufficiently large random samples from the population with replacement, then the distribution of the sample means will be approximately distributed same as the original population.
 - D. The larger the sample size n in sampling distribution of sample mean, the lesser the histogram is to show the normalcy of the distribution.
35. What is the estimate, if sample size of random sampling using Central Limit Theorem is almost normal in accordance to Statisticians?
- A. If $n = 2$
 - B. If $n = 3$
 - C. If $n = 10$
 - D. If $n = 30$
36. How do you compare the formula $z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}}$ from $z = \frac{\bar{x} - \mu}{\sigma}$?
- A. Former is used when solving z from original population while the latter is used in random sample.
 - B. Former is used when solving z from random sample while the latter is used in original population.
 - C. Former is used in random sample and original population but the latter can only be used for random sample.
 - D. Both can be used alternatively.



37. Which is NOT a correct statement?
- The total probability distribution of the sample mean is always equal to 1.
 - There are 10 possible samples of size 3 drawn in the population $N = 5$.
 - There are 31 possible samples of size 3 drawn in the population $N = 7$.
 - There are 20 possible samples of size 3 drawn in the population $N = 6$.
38. Human gestation length is said to be normally distributed with a mean of 266 days and a standard deviation of 16 days. Suppose 64 pregnancies are randomly selected. What is the probability that the average gestation length is between 262 and 270 days
- 95.45%
 - 95.50%
 - 95.75%
 - 95.80%
39. Formulate the steps to solve problems involving sampling distribution of the sample mean.
- Write the formula: $z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}}$
 - Solve z .
 - Look for the $P(z)$ in the Standard Normal Distribution Table
 - Substitute the values of the terms in the formula.
- I-IV-II-III
 - IV-III-II-I
 - I-II-III-IV
 - III-IV-I-II
40. Given a set of data, which of the following refers to number of independent observations that are free to vary after a sample statistic has been computed?
- Degrees of freedom
 - Mean
 - Standard error
 - Variance
41. The following are common properties of z -distribution and t -distribution, except:
- The mean, median, and mode are zero.
 - The total area under the curve is 100%.
 - The curve is asymptotic to the x -axis.
 - The variance is always greater than 1.
42. The following are characteristics of t -distribution except
- It is symmetric about the mean 0.
 - It is bell-shaped but has a heavier tail.
 - It depends on the degrees of freedom.
 - As the degrees of freedom decreases, it approaches to standard normal distribution.
43. Which of the following t is the t -value when $\mu = 127$, $\bar{x} = 120$, $s = 14$ and $n = 18$?
- 2.120
 - 2.110
 - +2.110
 - +2.120
44. In a t -distribution, if the sample size is 15, what is the degree of freedom?
- 12
 - 13
 - 14
 - 15
45. What percentile of the t distribution does 2.500 belong if the sample size is 24?



- A. 80th
 - B. 90th
 - C. 95th
 - D. 99th
46. Which of the following is the length of the interval between 45.5 and 60?
- A. 10.5
 - B. 14.5
 - C. 45.5
 - D. 60
47. The mean gasoline consumption of 15 cars is 38 liters with a standard deviation of 2 liters. Using a 95% confidence level, how long is the interval of the sample mean?
- A. 2.25
 - B. 2.30
 - C. 2.35
 - D. 2.40
48. What is the needed sample size if the margin of error is 0.8 and the standard deviation is 8 with a 95% confidence level?
- A. 325
 - B. 335
 - C. 345
 - D. 385
49. A researcher found that the mean score of Grade 9 students in the Math exam is normally distributed with a mean of 82 and a standard deviation of 2.5. The margin of error was known to be 0.65 at a 99% confidence level. How large a sample must be?
- A. 90
 - B. 92
 - C. 99
 - D. 10
50. Predict the length of the confidence interval and the sample size as the confidence level increases.
- A. The length of the confidence interval decreases and the sample size increases.
 - B. The length of the confidence interval increases and the sample size decreases.
 - C. The length of the confidence interval decreases and the sample size decreases.
 - D. The length of the confidence interval increases and the sample size increases.

