Final Examination Version ...

Instructions: Mark your answers on the answer sheets. Show your work in the test and turn in the tests and the answer sheets together. You may use a card with your notes. You may use your calculator. You may only submit your own work.

Problem 1
The relative frequency of a class is computed by

A. dividing the frequency of the class by the number of classes
B. dividing the frequency of the class by the class width
C. dividing the frequency of the class by the total number of observations in the data set
D. subtracting the lower limit of the class from the upper limit and multiplying the difference by the number of classes

Problem 2
The sum of the frequencies for all classes will always equal

A. the number of classes
B. the class width
C. the total number of observations in the data set
D. one

Problem 3
The following data represent a sample of 10 scores on a statistics quiz:

16 16 16 16 18 18 20 20 20

After the mean, median, range and variance were calculated for the scores, it was discovered that one of the scores of 20 should have been an 18. Which of the following will change when the calculations are redone using the correct scores?

A. Mean and range
B. Median
C. Mean and variance
D. Variance and range
Problem 7
Expressed in percentiles, the interquartile range is the difference between the

A. 20% and 80% values
B. 45% and 95% values
C. 25% and 75% values
D. 20% and 70% values

Problem 8
Given that
\[ s_x^2 = 100 \quad s_y^2 = 64 \quad s_{xy} = 60 \quad n = 8 \]

The slope of the best-fitting regression line is:

A. 0.75
B. 0.64
C. 0.60
D. 7.5

Problem 9
Which one of the following is always true for two events, A and B?

A. If A and B are independent, they are also mutually exclusive.
B. If A and B are dependent events, they are also mutually exclusive.
C. If \( P(A / B) = P(A \cap B) \), A and B are independent.
D. If \( P(A / B) = P(B / A) \), then A and B are independent.
E. If A and B are mutually exclusive, then A \( \cap B \) can never occur on the same trial of an experiment.
Problem 10
If \( P(A) = 0.30 \), \( P(B) = 0.40 \) and \( P(A \cap B) = 0.20 \), then \( P(A / B) \) is:

A. 0.12  
B. 0.08  
C. 0.67  
D. 0.50

Problem 11
An experiment consists of tossing 3 unbiased coins simultaneously. The number of simple events in this experiment is:

A. 3  
B. 6  
C. 8  
D. 9

Problem 12
If \( P(A) = 0.80 \), \( P(B) = 0.70 \) and \( P(A \setminus B) = 0.90 \), then \( P(A \cap B) \) is:

A. 0.60  
B. 0.56  
C. 0.72  
D. 0.63
Problem 13
A telephone survey of American families is conducted to determine the number of children in the average American family. Past experience has shown that 30% of the families who are telephoned will refuse to respond to the survey. Which of the following statements is not a binomial random variable?

A. The number of families out of 50 who respond to the survey.
B. The number of families out of 50 who refuse to respond to the survey.
C. The number of children in a family which responds to the survey.
D. All of the above are binomial random variables.

Problem 14
Given a Poisson random variable \( x \), where the average number of times an event occur in a certain period of time is 2.5, then \( P(x = 0) \) is

A. 2.5
B. 0.0821
C. 1.5811
D. 0.40

Problem 15
Suppose there is a 40 percent chance that a person prefers Pepsy products over Coke products. If we were to take a sample of 15 people, what is the probability exactly 6 prefer Pepsy products?

A. 0.610
B. 0.207
C. 0.390
D. 0.311
E. 0.047
Problem 16
If the random variable $x$ is normally distributed with a mean of 88 and a standard deviation of 12, then $P(X \geq 96)$ is

A. 0.2486
B. 0.2514
C. 0.1243
D. 0.4972

Problem 17
The $z$-score representing the third quartile of the standard normal distribution is:

A. 0.67
B. -0.67
C. 1.28
D. -1.28

Problem 18
Which of the following statements is true with regard to continuous random variables?

A. The height of the curve shows the probability of an event.
B. The probability of exactly an event A occurring is always equal to one.
C. Probabilities of events are determined from areas under the curve.
D. The probability distribution is always mound-shaped.
Problem 4
Which of the following randomly selected measurements, \( x \), might be considered a potential outlier (i.e., an unusual measurement) if it was selected from the given population?

A. \( x = 0 \) from a population with \( \mu = 0 \) and \( \sigma = 2 \)
B. \( x = -5 \) from a population with \( \mu = 1 \) and \( \sigma = 4 \)
C. \( x = 7 \) from a population with \( \mu = 3 \) and \( \sigma = 2 \)
D. \( x = 4 \) from a population with \( \mu = 0 \) and \( \sigma = 1 \)
E. \( x = 10 \) from a population with \( \mu = 0 \) and \( \sigma = 5 \)

Problem 5
Which one of the values below represents a lower quartile for the data set 23, 24, 21, and 20?

A. 22.0
B. 22.5
C. 20.25
D. 23.5

Problem 6
The average score for a class of 35 students was 70. The 20 male students in the class averaged 73. The 15 female students in the class averaged:

A. 73
B. 70
C. 66
D. 60