DISCUSSION SECTION NUMBER FOR EXAM RETURN _____

STATISTICS 2023   **NAME, IN INK**_____

EXAM TWO   **SIGNATURE, IN INK**_____

SPRING 2000   **SS NUMBER, IN INK**_____

Retain this exam for grade verification once it is graded and returned to you.

TRUE OR FALSE. Answer with a capital T or F.   **(3 points each)**

_____ 1. The number of credit hours that a student completes each semester while in college is a discrete random variable.

_____ 2. The Binomial random variable is the number of trials that would occur in a set time or spatial period.

_____ 3. The probability structure for a discrete random variable is represented graphically with curves known as probability density functions.

_____ 4. The normal distribution always has half of the probability on values that are less than the mean of the variable and half of the probability on values that are greater than the mean of the variable.

_____ 5. For a uniform continuous random variable the unit of probability is spread across the values of the variable in the shape of the bell shaped curve.

_____ 6. The probability that a normally distributed random variable has values that are within three standard deviations of the mean is 99.74%.

_____ 7. The mean of the set of all possible sample means is equal to the mean of the sampled population and the standard deviation of the set of all possible sample means is equal to the standard deviation of the sampled population.

STANDARD NORMAL DISTRIBUTION QUESTIONS. State the answer on the line provided.   **(3 points each)**

_____ 8. Find z_o if $P(Z > z_o) = 0.9394$.

_____ 9. Find the $P(.3 < Z < 1.54)$.

_____ 10. What is the $P(Z > 1.53)$?

STATE THE ANSWER. State the answer on the line given.   (3 points each)

_____ 11. A very difficult computer game allows its opponent to win only 5% of the time. If this game is played seven times what is the probability that the computer's opponent will win fewer than 2 times? State the answer with three digits past the decimal.

_____ 12. Sixty percent of all the calls to your residence are for your roommate. Out of six calls, what is the probability that more than two of the calls are for your roommate? State the answer with three digits past the decimal.

_____ 13. On average there are 4.6 patients admitted to a certain hospital every day. If the hospital only has five beds available and no one is released from the hospital what is the probability that the hospital will not have adequate beds for the number of people admitted the next day? State the answer with three digits past the decimal.

_____ 14. On average if the University of Oklahoma has 2.8 team fouls for every five minutes of basketball play what is the probability that in five minutes of play that OU has seven or fewer fouls? State the answer with three digits past the decimal.

_____ 15. The computer parts manufactured by the Superstars Computer Company are very fragile and nineteen percent of the parts are damaged by the time they reach their purchaser. If you purchase five of these parts what is the chance that at least one the parts is damaged by the time you receive them? Round your answer to four digits past the decimal.

_____ 16. If it is known that the average number of accidental gun shootings in a certain state is 1.2 per day what is the probability of 3 accidental shootings in a day in that state? Round your answer to four digits past the decimal.

STATE THE ANSWER. State the answer on the line given.   (4 points each)

A small company in Altus, Oklahoma reimburses their employees for expenses each month. The amount of employee reimbursements each month is uniformly distributed between the values of $4,000 and $8,000. Use this information to answer the next three questions.

_____ 17. What is the expected amount of employee reimbursement per month at this company in Altus, Oklahoma?

_____ 18. What is the probability of employee reimbursements exceeding $7,500 next month?

_____ 19. For budgeting purposes, the company needs to estimate next month's employee reimbursement expenses. How much money should the company budget if they want the probability of exceeding the budgeted amount to be only .30?

Assume that the random variable X has a normal distribution with a mean of 175 units and a standard deviation of 10 units. Use this information to answer the next three questions.

_____20. Two and one-half percent of all the values of the random variable X are less than what value?

_____ 21. If the distribution of X is as described above what is the probability that X has values between 180 and 193.8?

_____ 22. If the distribution of X is as described above, then what is the value of the 33rd percentile of the distribution?

STATE THE ANSWER. State the answer on the line given.   (4 points each)
The monthly return on a risky investment is normally distributed with mean of $1,200 and a standard deviation of $275. Use this information to answer the next three questions.

_____23. What is the expected monthly return on an investment of the type described above?

_____ 24. What is the chance that an investor receives a return of more than $1,794 on this type of risky investment?

_____ 25. Only 1.5% of all the people involved in this type of risky investment enjoy returns greater than what amount?

Assume that a sample of 900 observations was randomly drawn from a population with a mean of 485 and a standard deviation of 18. Use this information to answer the remaining questions.

_____ 26. What is the numerical value of the mean of all possible sample means that would result from the above situation?

_____ 27. What is the numerical value of the standard deviation of all possible sample means that would result from the above situation?

_____ 28. Only 0.25% (or 0.0025) of the sample means that result from the above sampling situation will be more than what value? State three digits past the decimal.

_____ 29. What is the probability that the sample mean which results from the above situation will be between 483.68 and 484.28?