



Quiz 5, Discrete Probability Distribution, Name \_\_\_\_\_, Grade: \_\_\_\_\_

10. What is the probability that more than one and less than four fire alarms went out in a year

$P(\text{_____}) = \text{_____}$ ? In Excel \_\_\_\_\_

11. What is the expected number  $E(X)$  of fire alarms went out in a year \_\_\_\_\_?

12. What are the variance ( $\text{Var}(X)$  or  $\sigma^2$ ) \_\_\_\_\_ and the standard deviation ( $\text{Std}(X)$  or  $\sigma$ )

\_\_\_\_\_ of the number of fire alarms went out in a year?

**This problem is associated with questions 13 to 14.**

Suppose that past history shows that 60% of college students prefer Brand C cola. A sample of 10 students is to be selected. We are interested in the number of students who prefer Brand C cola.

13. What type of probability distribution will most likely be used to solve the problem?

- a. Binomial distribution.
- b. Poisson distribution.
- c. Continuous distribution.
- d. None of the above.

14. What is the mean \_\_\_\_\_, the variance \_\_\_\_\_, and the standard deviation \_\_\_\_\_?

Given the number of mistakes as binomial distributed with  $n = 5$ , and  $p = 0.3$ , answer **questions 15 to 17.**

15. What is the Excel function for  $P(X = 2)$  \_\_\_\_\_?

16. What is the Excel function for  $P(X \leq 2)$  \_\_\_\_\_?

17. What is the Excel function for  $P(X \geq 2)$  \_\_\_\_\_?

18. A probability distribution is an equation that

- a. associates a particular probability of occurrence with each outcome in the sample space.
- b. measures outcomes and assigns values of  $X$  to the simple events.
- c. assigns a value to the variability in the sample space.
- d. assigns a value to the center of the sample space.

19. The connotation "expected value" or "expected gain" from playing roulette at a casino means

- a. the amount you expect to "gain" on a single play.
- b. the amount you expect to "gain" in the long run over many plays.
- c. the amount you need to "break even" over many plays.
- d. the amount you should expect to gain if you are lucky.

20. Which of the following about the binomial distribution is **not** a true statement?

- a. The probability of success must be constant from trial to trial.
- b. Each outcome is independent of the other.
- c. Each outcome may be classified as either "success" or "failure."
- d. The random variable of interest is continuous.

A test has five multiple choices questions. Each question has four choices as a), b), c), and d). One and only one of the choices is the correct answer for each question. Assume Mr. Smarty has no knowledge about the subject of the test and thus he will have equal chance to pick up any choice for a question as his answer. Answer the following questions:

21. What type of probability distribution will be most likely to be used to analyze the problem?

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- a. Continue distribution
- b. Random variable
- c. Binomial distribution
- d. Normal distribution

22. What are the parameters and their values for the underlying probability distribution? \_\_\_\_\_

23. What is the probability that Smarty will answer exactly two questions correctly?

24. What is the probability that Smarty will answer at most two questions correctly?

25. What is the probability that Smarty will answer more than two questions correctly?

26. What is the mean number of questions that Smarty might answer correctly?

27. What is the standard deviation for the number of questions that Smarty might answer correctly?