Exam 2– STA 2023 – Summer 2018

Directions: For the multiple choice part make sure you clearly label your answer. If you need extra space please use the extra blank sheet with appropriate labeling.

1. Complete the table using the data provided

X	P(x)	x*P(x)
1	0.10	
2	0.05	
3	0.10	
4		
5	0.30	
6	0.20	
7	0.10	

2. In the table above what is $P(X < 4)$?

3. Find the expected value from the expected value table.

X	P(x)	x*P(x)
2	0.1	2(0.1) = 0.2
4	0.3	4(0.3) = 1.2
6	0.4	6(0.4) = 2.4
8	0.2	8(0.2) = 1.6

$E(X) = $ _____

4. X is a random variable that is modeled by a binomial distribution. Which of the following denotes this?

(A) $X \sim G(p)$ (B) $X \sim H(r, b, n)$ (C) $X \sim P(\mu)$ (D) $X \sim B(n, p)$ (E) $X \sim N(\mu, \sigma)$

5. You flip a coin 10 times. What is the probability that you get exactly 5 heads?

(A) .50   (B) .75   (C) .25   (D) .62   (E) .01

6. The binomial random variable X represents the number of successes in 10 independent trials. Which of the following represents the probability of fewer than two successes?

   (A) $P(X \leq 2)$ (B) $P(X < 2)$ (C) $P(X > 8)$ (D) $P(X \leq 8)$

   Use the following information for the next three problems. The probability that the San Jose Sharks will win any given game is 0.3694 based on a 13-year win history of 382 wins out of 1,034 games played (as of a certain date). An upcoming monthly schedule contains 12 games.

7. The expected number of wins for that upcoming month is

   (A) 12   (B) 1.67   (C) 4.43   (D) $\frac{382}{1043}$ (E) 6

8. What is the probability that the San Jose Sharks win six games in that upcoming month

   (A) .8903   (B) .7664   (C) .2336   (D) .1476   (E) .5101

9. What is the probability that the San Jose Sharks win at least five games in that upcoming month

   (A) .5266   (B) .3694   (C) .4734   (D) .2305   (E) 0.6712

10. The binomial random variable X represents the number of successes in 10 independent trials. Which of the following represents the probability of fewer than three failures?

    (A) $P(X \leq 3)$ (B) $P(X < 3)$ (C) $P(X > 7)$ (D) $P(X \leq 7)$

11. Given a binomial distribution $X \sim B(n, p)$, what is the formula for the mean or expected value?

12. Given a binomial distribution $X \sim B(n, p)$, what is the formula for the standard deviation of the distribution?

13. You have two bags each with 5 buttons in them labeled 1 through 5. You select a button from each bag and let X denote the random variable (r.v.) given by the sum.

   (a) Draw a table which produces the outputs of the r.v.

   (b) Fill in the frequency distribution chart below.

x	2	3	4	5	6	7	8	9	10
$p(x)$									

$xp(x)$									

   (c) Is X modeled by a binomial distribution?

   (d) What is the expected sum $E(X)$?

   (e) What is the probability that the sum is a 3 given that one of the buttons has an even number?