Chapter 15–16 Test Review

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the expected value of the random variable. Round to three decimal places.

1) The accompanying table describes the probability distribution for the number of adults in a certain town (among 4 randomly selected adults) who have a college degree. 1) _____

x	P(x)
0	0.4096
1	0.4096
2	0.1536
3	0.0256
4	0.0016

A) 2.00 B) 0.80 C) 0.95 D) 1.21 E) 0.70

Create a probability model for the random variable.

2) An insurance policy costs $200, and will pay policyholders $10,000 if they suffer a major injury (resulting in hospitalization), or $5,000 if they suffer a minor injury (resulting in lost time from work). The company estimates that each year 1 in every 2,500 policyholders may have a major injury, and 1 in 1,000 a minor injury. Create a probability model for the company's profit on this policy. 2) _____

A)

Profit	$200	$9,800	$4,800
P(profit)	0.9986	0.0004	0.001

B)

Profit	$200	– $9,800	–$4,800
P(profit)	0.9986	0.0004	0.001

C)

Profit	$200	$10,200	$5,200
P(profit)	0.9986	0.0004	0.001

D)

Profit	$200	–$10,200	–$5,200
P(profit)	0.9986	0.0004	0.001

E)

Profit	$200	$10,000	$5,000
P(profit)	0.9986	0.0004	0.001

Find the standard deviation of the random variable.

3) A teacher grading statistics homeworks finds that none of the students has made more than three errors. 13% have made three errors, 27% have made two errors, and 40% have made one error. Find the standard deviation of the number of errors in students' statistics homeworks. 3) _____

A) 0.80 B) 0.86 C) 1.08 D) 0.94 E) 0.88

Create a probability model for the random variable.

4) You have arranged to go camping for two days in March. You believe that the probability that it will rain on the first day is 0.4. If it rains on the first day, the probability that it also rains on the second day is 0.6. If it doesn't rain on the first day, the probability that it rains on the second day is 0.4. 4) _____

Let the random variable X be the number of rainy days during your camping trip. Find the probability model for X.

A)

Rainy days	0	1	2
P(Rainy days)	0.36	0.16	0.24

B)

Rainy days	0	1	2
P(Rainy days)	0.36	0.48	0.16

C)

Rainy days	0	1	2
P(Rainy days)	0.36	0.4	0.24

D)

Rainy days	0	1	2
P(Rainy days)	0.24	0.52	0.24

E)

Rainy days	0	1	2
P(Rainy days)	0.36	0.24	0.24

Find the expected value of the random variable. Round to three decimal places.

5) In a box of 8 batteries, 6 are dead. You choose two batteries at random from the box. 5) _____
Let the random variable X be the number of good batteries you get. Find the expected value of X.

A) $\mu = 0.29$ B) $\mu = 0.50$ C) $\mu = 0.63$ D) $\mu = 1.50$ E) $\mu = 0.86$

Solve.

6) Given independent random variables with means and standard deviations as shown, find the mean and standard deviation of the variable X – Y. Round to two decimal places if necessary. 6) _____

	Mean	SD
X	110	12
Y	170	10

A) $\mu = 280, \sigma = 15.62$
B) $\mu = -60, \sigma = 22$
C) $\mu = -60, \sigma = 6.63$
D) $\mu = -60, \sigma = 2$
E) $\mu = -60, \sigma = 15.62$

7) Given independent random variables with means and standard deviations as shown, find the mean and standard deviation of the variable X + 4Y . Round to two decimal places if necessary. 7) _____

	Mean	SD
X	70	12
Y	80	7

A) $\mu = 390, \sigma = 40$
B) $\mu = 150, \sigma = 40$
C) $\mu = 320, \sigma = 30.46$
D) $\mu = 150, \sigma = 30.46$
E) $\mu = 390, \sigma = 30.46$

8) A company selling vegetable seeds in packets of 40 estimates that the mean number of seeds that will actually grow is 35.9 with a standard deviation of 1.6 seeds. If a customer buys 5 different seed packets, what are the expected value and standard deviation of the number of bad seeds? Assume that packets are independent of each other. 8) _____

A) $\mu = 80.27, \sigma = 8$
B) $\mu = 179.5, \sigma = 3.58$
C) $\mu = 179.5, \sigma = 8$
D) $\mu = 80.27, \sigma = 3.58$
E) $\mu = 179.5, \sigma = 40$

Determine whether a probability model based on Bernoulli trials can be used to investigate the situation. If not, explain.

9) A pool of possible jurors consists of 11 men and 14 women. A jury of 12 is picked at random from this group. What is the probability that the jury contains all women? 9) _____

A) Yes
B) No. The chance of a woman changes depending on who has already been picked.
C) No. 11 is more than 10% of 14
D) Yes, assuming the possible jurors are unrelated
E) No. There are more than two possible outcomes on each trial.

Calculate the probability model.

10) A basketball player makes 30% of her foul shots. She shoots 5 foul shots. You are interested in the number of shots that she makes out of the 5. Find the probability model. 10) _____

x	0	1	2	3	4	5
P(x)						

A)

x	0	1	2	3	4	5
P(x)	0.00243	0.00567	0.01323	0.03087	0.07203	0.16807

B)

x	0	1	2	3	4	5
P(x)	0.00243	0.02835	0.1323	0.3087	0.36015	0.16807

C)

x	0	1	2	3	4	5
P(x)	0.16807	0.36015	0.3087	0.1323	0.02835	0.00243

D)

x	0	1	2	3	4	5
P(x)	0.16807	0.07203	0.03087	0.01323	0.00567	0.00243

E)

x	0	1	2	3	4	5
P(x)	0.7	0.3	0.09	0.027	0.0081	0.00243

Find the indicated probability.

11) An archer is able to hit the bull's eye 71% of the time. If she shoots 10 arrows, what is the probability that her first bull's–eye comes on the 4th arrow? Assume each shot is independent of the others. 11) _____

A) 0.01732 B) 0.00502 C) 0.10379 D) 0.71 E) 0.02439

Find the indicated probability. Round to four decimal places.

12) Suppose that 14% of people in one city speak Spanish. What's the probability that we won't find a person who speaks Spanish before the 6th person? 12) _____

A) 0.1400 B) 0.0566 C) 0.4046 D) 0.0659 E) 0.4704

Solve. Round to two decimal places if necessary.

13) A company finds that 65% of applicants for a job do not have the required qualifications. On average, how many applications should they expect to read before finding a suitably qualified applicant? 13) _____

A) 0.65 B) 1.54 C) 0.35 D) 65 E) 2.86

Find the indicated probability.

14) A tennis player makes a successful first serve 48% of the time. If she serves 8 times, what is the probability that she gets exactly 3 first serves in? Assume that each serve is independent of the others. 14) _____

A) 0.1106 B) 0.1275 C) 0.2355 D) 0.0042 E) 0.7645

Find the probability of the outcome described.

15) A test consists of 10 true/false questions. If a student guesses on each question, what is the probability that the student will answer at least 9 questions correctly. 15) _____

A) 0.9 B) 0.001 C) 0.999 D) 0.010 E) 0.011

Solve the problem.

16) A company manufactures batteries in batches of 15 and there is a 3% rate of defects. Find the mean number of defects per batch. 16) _____

A) 0.45 B) 0.465 C) 0.435 D) 14.55 E) 3.0

17) Suppose that 1.8% of people are left handed. If 40 people are selected at random, what is the standard deviation of the number of right–handers in the group? 17) _____

A) 0.72 B) 0.70704 C) 6.27 D) 0.84 E) 0.85

Find the indicated probability by using an appropriate normal model to approximate the binomial distribution

18) Bill claims that he has a coin which is biased and which comes up heads more than tails. His claim is based on a trial in which he flipped the coin 200 times and got 110 heads. If the coin were actually fair, what would be the probability of getting 110 or more heads? 18) _____

A) 0.0787 B) 0.4211 C) 0.9213 D) 0.0591 E) 0.5789

Provide an appropriate response.

19) A tennis player usually makes a successful first serve 71% of the time. She buys a new racket hoping that it will improve her success rate. When she first tests her new racket she makes 4 first serves in a row. Is this evidence that with the new racket her success rate has improved? In other words, is a streak like this unusual for her? Explain. 19) _____

A) No; if her success rate were still 71%, she would have a 28.4% chance of making 4 shots in a row. That's not an unusual result.

B) No; if her success rate were still 71%, she would have a 25.4% chance of making 4 shots in a row. That's not an unusual result.

C) Yes; if her success rate were still 71%, she would have only a 2.8% chance of making 4 shots in a row. That's an unusual result.

D) Yes; if her success rate were still 71%, she would have only a 0.71% chance of making 4 shots in a row. That's an unusual result.

E) Yes; if her success rate were still 71%, she would have only a 25.4% chance of making 4 shots in a row. That's an unusual result.

Find the indicated probability.

20) Police estimate that 65% of drivers wear their seat belts. If they stop 3 drivers at random, what's the probability that none of them are wearing their seat belts? 20) _____

A) 0.105 B) 0.0429 C) 0.195 D) 0.2746 E) 0.35

Answer Key
Testname: UNTITLED1

1) B
2) B
3) D
4) C
5) B
6) E
7) E
8) B
9) B
10) C
11) A
12) E
13) E
14) C
15) E
16) A
17) D
18) A
19) B
20) B