Name_____

Each of the 19 questions is worth 6 points for a total of 114 possible points.
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the indicated probability.

1) A basketball player has made 78% of his foul shots during the season. Assuming the shots are independent, find the probability that in tonight's game he makes his first basket on one of his first 6 shots. 1) _____

A) 0.00011 B) 0.22520 C) 0.06352 D) 0.00040 E) 0.99989

2) A multiple choice test has 10 questions each of which has 4 possible answers, only one of which is correct. If Judy, who forgot to study for the test, guesses on all questions, what is the probability that she will answer exactly 3 questions correctly? 2) _____

A) 0.0156 B) 0.7497 C) 0.2816 D) 0.2503 E) 0.0021

3) A basketball player has made 70% of his foul shots during the season. Assuming the shots are independent, find the probability that in tonight's game he misses for the first time on his 8th attempt? 3) _____

A) 0.0824 B) 0.0247 C) 0.3 D) 0.0173 E) 0.0576

Provide an appropriate response.

4) A multiple choice test consists of 60 questions. Each question has 4 possible answers only one of which is correct. A student answers 26 questions correctly. Is that enough to convince you that he is not merely guessing? Explain. 4) _____

A) Yes; if the student were guessing, we would expect him to answer 15 questions correctly with a standard deviation of 3.87. 26 is 2.8 standard deviations above the expected value. That would be an unusual result

B) No; if the student were guessing, we would expect him to answer 15 questions correctly with a standard deviation of 11.25. 26 is 0.98 standard deviations above the expected value. That would not be an unusual result

C) Yes; if the student were guessing, we would expect him to answer 15 questions correctly with a standard deviation of 3.35. 26 is 3.3 standard deviations above the expected value. That would be an unusual result.

D) No; if the student were guessing, we would expect him to answer 15 questions correctly with a standard deviation of 3.35. 26 is 3.3 standard deviations above the expected value. That would not be an unusual result.

E) Yes; if the student were guessing, we would expect him to answer 15 questions correctly with a standard deviation of 3.10. 26 is 3.5 standard deviations above the expected value. That would be an unusual result.

Solve the problem.

5) A company manufactures batteries in batches of 14 and there is a 3% rate of defects. Find the standard deviation of the number of defects per batch. 5) _____

A) 0.648 B) 0.638 C) 0.291 D) 0.615 E) 0.636

6) A final exam in Math 160 has a mean of 73 with standard deviation 7.8. If 24 students are randomly selected, find the probability that the mean of their test scores is greater than 78. 6) _____

A) 0.0103 B) 0.0036 C) 0.0008 D) 0.8962

7) In the town of Blue Valley, 6% of female college students suffer from manic–depressive illness. If 170 of the female students are selected at random, what is the mean of the number who suffer from manic–depressive illness? 7) _____

A) 159.8 B) 10.2 C) 3.10 D) 85 E) 9.59

8) A study of the amount of time it takes a mechanic to rebuild the transmission for a 1992 Chevrolet Cavalier shows that the mean is 8.4 hours and the standard deviation is 1.8 hours. If 40 mechanics are randomly selected, find the probability that their mean rebuild time exceeds 8.1 hours. 8) _____

A) 0.8457 B) 0.7285 C) 0.9146 D) 0.8531

Create a probability model for the random variable.

9) A carnival game offers a $80 cash prize for anyone who can break a balloon by throwing a dart at it. It costs $5 to play and you're willing to spend up to $20 trying to win. You estimate that you have a 8% chance of hitting the balloon on any throw. Create a probability model for the amount you will win. Assume that throws are independent of each other. Round to four decimal places if necessary. 9) _____

A)

Amount won	$75	$70	$65	$60	–$20
P(Amount won)	0.08	0.0736	0.0677	0.0623	0.0573

B)

Amount won	$75	$70	$65	$60	–$20
P(Amount won)	0.08	0.0736	0.0677	0.0623	0.7164

C)

Amount won	$80	$75	$70	$65	–$20
P(Amount won)	0.08	0.0736	0.0677	0.0623	0.0573

D)

Amount won	$75	$70	$65	$60	
P(Amount won)	0.08	0.0736	0.0677	0.7787	

E)

Amount won	$80	$75	$70	$65	–$20
P(Amount won)	0.08	0.0736	0.0677	0.0623	0.7164

10) In a box of 8 batteries, 3 are dead. You choose two batteries at random from the box. Let the random variable X be the number of good batteries you get. Find the probability model for X. 10) _____

A)

Number good	0	1	2
P(Number good)	0.107	0.268	0.357

B)

Number good	0	1	2
P(Number good)	0.055	0.436	0.509

C)

Number good	0	1	2
P(Number good)	0.141	0.469	0.391

D)

Number good	0	1	2
P(Number good)	0.357	0.536	0.268

E)

Number good	0	1	2
P(Number good)	0.107	0.536	0.357

Find the specified probability, from a table of Normal probabilities.

11) Assume that 20% of students at a university wear contact lenses. We randomly pick 200 students. What is the probability that more than 22% of this sample wear contact lenses? 11) _____

A) 0.520 B) 0.239 C) 0.760 D) 0.707 E) 0.480

Find the probability of the outcome described.

12) An airline estimates that 93% of people booked on their flights actually show up. If the airline books 63 people on a flight for which the maximum number is 61, what is the probability that the number of people who show up will exceed the capacity of the plane? 12) _____

A) 0.0490 B) 0.0594 C) 0.9406 D) 0.1737 E) 0.0103

Find the standard deviation of the random variable. Round to two decimal places if necessary.

13)

x	100	200	300	400
P(X = x)	0.2	0.4	0.3	0.1

13) _____

A) 90.00 B) 99.00 C) 117.00 D) 108.00 E) 82.80

Find the expected value of the random variable.

14) You roll a pair of dice. If you get a sum greater than 10 you win $50. If you get a double you win $25. If you get a double and a sum greater than 10 you win a $75. Otherwise you win nothing. You pay $5 to play.
Find the expected amount you win at this game. 14) _____

A) $5.42 B) $8.33 C) $4.03 D) $3.33 E) $4.72

15) The probability model below describes the number of thunderstorms that a certain town may experience during the month of August. 15) _____

Number of storms	0	1	2	3
Probability	0.1	0.2	0.5	0.2

How many storms can the town expect each August?

A) 2.3 B) 1.8 C) 1.5 D) 1.9 E) 2.0

16) Your soccer team, Mill Valley, plays two games against Fairfield soccer team . The probability that your team wins the first game is 0.6. If your team wins the first game, the probability that they also win the second game is 0.7. If your team loses the first game, the probability that they win the second game is 0.5.
Let the random variable X be the number of games won by your team, Mill Valley. Find the expected value of X. 16) _____

A) $\mu = 1.04$ B) $\mu = 1.10$ C) $\mu = 1.30$ D) $\mu = 1.22$ E) $\mu = 1.02$

Solve.

17) A laboratory worker finds that 2.2% of his blood samples tested positive for the HIV virus. How many blood samples should he expect to test before finding one which tests positive for the HIV virus? 17) _____

A) 97.8 B) 45.45 C) 2.2 D) 0.978 E) 1.02

Identify the given random variable as being discrete or continuous.

18) The number of freshmen in the required course, English 101 18) _____

A) Discrete B) Continuous

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

19) We draw a card from a deck 40 times to find the distribution of the suits. After each draw the card is replaced. 19) _____

A) Yes.

B) No. 40 is more than 10% of 52

C) No. The chance of getting each suit changes from one draw to the next.

D) No. The draws are not independent of each other.

E) No. More than two outcomes are possible.

Answer Key
Testname: TEST2

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