

Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**Determine whether the given procedure results in a binomial distribution. If not, state the reason why.**

- 1) Choosing 5 people (without replacement) from a group of 23 people, of which 15 are women, keeping track of the number of men chosen. 1) _____
- A) Procedure results in a binomial distribution.
 B) Not binomial: the trials are not independent.
 C) Not binomial: there are too many trials.
 D) Not binomial: there are more than two outcomes for each trial.

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

- 2) Sue Anne owns a medium-sized business. The probability model below describes the number of employees that may call in sick on any given day. 2) _____

| Number of Employees Sick | 0 | 1 | 2 | 3 | 4 |
|--------------------------|------|-----|-----|-----|------|
| $P(X = x)$ | 0.05 | 0.4 | 0.3 | 0.2 | 0.05 |

What is the standard deviation of the number of employees calling in sick each day?

- A) 0.96 B) 1.08 C) 1.18 D) 0.98 E) 0.88

Identify the given random variable as being discrete or continuous.

- 3) The height of a randomly selected student 3) _____
- A) Continuous B) Discrete

Find the indicated probability.

- 4) Suppose that in a certain population 45% of people have type O blood. A researcher selects people at random from this population. What is the probability that there is a person with type O blood among the first 8 people checked? 4) _____
- A) 0.0084 B) 0.9916 C) 0.0152 D) 0.0017 E) 0.0069
- 5) Suppose that 11% of people are left handed. If 6 people are selected at random, what is the probability that exactly 2 of them are left handed? 5) _____
- A) 0.2278 B) 0.0121 C) 0.0076 D) 0.1139 E) 0.0188
- 6) An archer is able to hit the bull's eye 76% 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. 6) _____
- A) 0.76 B) 0.00252 C) 0.10535 D) 0.01382 E) 0.01051

Solve the problem.

- 7) A laboratory worker finds that 2.6% of his blood samples test positive for the HIV virus. In a random sample of 70 blood tests, what is the mean number that test positive for the HIV virus? 7) _____
- A) 1.33 B) 68.18 C) 1.82 D) 18.2 E) 1.77

- 8) 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 71. 8) _____
 A) 0.5036 B) 0.9012 C) 0.8962 D) 0.0008
- 9) A laboratory worker finds that 2.3% of his blood samples test positive for the HIV virus. In a random sample of 160 blood tests, what is the standard deviation of the number that test positive for the HIV virus? 9) _____
 A) 3.68 B) 12.50 C) 3.59536 D) 1.90 E) 1.92
- 10) 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 is less than 7.6 hours. 10) _____
 A) 0.0025 B) 0.0103 C) 0.0036 D) 0.0008

Find the expected value of the random variable.

- 11) Sue Anne owns a medium-sized business. The probability model below describes the number of employees that may call in sick on any given day. 11) _____

| | | | | | |
|--------------------------|-----|------|------|------|------|
| Number of Employees Sick | 0 | 1 | 2 | 3 | 4 |
| $P(X = x)$ | 0.1 | 0.35 | 0.25 | 0.25 | 0.05 |

What is the expected value of the number of employees calling in sick each day?

- A) 1.80 B) 1.00 C) 2.00 D) 1.85 E) 1.90
- 12) Hugh buys \$10,000 worth of stock in an electronics company which he hopes to sell afterward at a profit. The company is developing a new laptop computer and a new desktop computer. If it releases both computers before its competitor, the value of Hugh's stock will jump to \$22,000. If it releases one of the computers before its competitor, the value of Hugh's stock will jump to \$15,000. If it fails to release either computer before its competitor, Hugh's stock will be worth only \$6000. Hugh believes that there is a 40% chance that the company will release the laptop before its competitor and a 30% chance that the company will release the desktop before its competitor. Find Hugh's expected profit. Assume that the development of the laptop and the development of the desktop are independent events. 12) _____
 A) \$3860 B) \$12,060 C) \$2.78 D) \$2060 E) \$3260
- 13) 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 0.5. If it rains on the first day, the probability that it also rains on the second day is 0.5. If it doesn't rain on the first day, the probability that it rains on the second day is 0.3. 13) _____
 Let the random variable X be the number of rainy days during your camping trip. Find the expected value of X.
 A) $\mu = 1.05$ B) $\mu = 1$ C) $\mu = 0.65$ D) $\mu = 0.75$ E) $\mu = 0.9$

Solve.

- 14) At one college, 52% of students have credit cards. A credit card company, looking for new customers, sets up a booth at the college. If they pick students at random, how many students should they expect to talk to before finding one who does not have a credit card? 14) _____
 A) 1.92 B) 48 C) 52 D) 2.08 E) 0.48

Create a probability model for the random variable.

- 15) A company bids on two contracts. It anticipates a profit of \$70,000 if it gets the larger contract and a profit of \$40,000 if it gets the smaller contract. It estimates that there's a 10% chance of winning the larger contract and a 60% chance of winning the smaller contract. Create a probability model for the company's profit. Assume that the contracts will be awarded independently. 15) _____

A)

| | | | |
|-----------|-----|----------|----------|
| Profit | \$0 | \$40,000 | \$70,000 |
| P(Profit) | 0.3 | 0.6 | 0.1 |

B)

| | | | |
|-----------|------|----------|----------|
| Profit | \$0 | \$40,000 | \$70,000 |
| P(Profit) | 0.36 | 0.54 | 0.04 |

C)

| | | | | |
|-----------|------|----------|----------|-----------|
| Profit | \$0 | \$40,000 | \$70,000 | \$110,000 |
| P(Profit) | 0.36 | 0.54 | 0.04 | 0.06 |

D)

| | | | | |
|-----------|------|----------|----------|-----------|
| Profit | \$0 | \$40,000 | \$70,000 | \$110,000 |
| P(Profit) | 0.24 | 0.6 | 0.1 | 0.06 |

E)

| | | | | |
|-----------|------|----------|----------|-----------|
| Profit | \$0 | \$40,000 | \$70,000 | \$110,000 |
| P(Profit) | 0.36 | 0.54 | 0.04 | 0.7 |

- 16) A company is interviewing applicants for managerial positions. They plan to hire two people. They have already rejected most candidates and are left with a group of 7 applicants of whom 5 are women. Unable to differentiate further between the applicants, they choose two people at random from this group of 7. 16) _____

Let the random variable X be the number of men that are chosen. Find the probability model for X.

A)

| | | | |
|---------------|-------|-------|-------|
| Number men | 0 | 1 | 2 |
| P(Number men) | 0.476 | 0.238 | 0.048 |

B)

| | | | |
|---------------|-------|-------|-------|
| Number men | 0 | 1 | 2 |
| P(Number men) | 0.510 | 0.408 | 0.082 |

C)

| | | | |
|---------------|-------|-------|-------|
| Number men | 0 | 1 | 2 |
| P(Number men) | 0.048 | 0.476 | 0.476 |

D)

| | | | |
|---------------|--------|--------|--------|
| Number men | 0 | 1 | 2 |
| P(Number men) | 18.333 | 64.167 | 38.500 |

E)

| | | | |
|---------------|-------|-------|-------|
| Number men | 0 | 1 | 2 |
| P(Number men) | 0.476 | 0.476 | 0.048 |

Find the probability of the outcome described.

- 17) A car insurance company has determined that 7% of all drivers were involved in a car accident last year. If 15 drivers are randomly selected, what is the probability that at least 3 were involved in a car accident last year? 17) _____

A) 0.0829 B) 0.0653 C) 0.4196 D) 0.9347 E) 0.9171

Provide an appropriate response.

- 18) A tennis player usually makes a successful first serve 74% of the time. She buys a new racket hoping that it will improve her success rate. During the first month of playing with her new racket she makes 373 successful first serves out of 460. Is this evidence that with the new racket her success rate has improved? In other words, is this an unusual result for her? Explain. 18) _____
- A) Yes; we would normally expect her to make 340.4 first serves with a standard deviation of 88.50. 373 is 0.4 standard deviations above the expected value. That's an unusual result.
- B) No; we would normally expect her to make 340.4 first serves with a standard deviation of 18.45. 373 is 1.8 standard deviations above the expected value. That's not an unusual result.
- C) No; we would normally expect her to make 340.4 first serves with a standard deviation of 9.41. 373 is 3.5 standard deviations above the expected value. That's not an unusual result.
- D) No; we would normally expect her to make 340.4 first serves with a standard deviation of 88.50. 373 is 0.4 standard deviations above the expected value. That's not an unusual result.
- E) Yes; we would normally expect her to make 340.4 first serves with a standard deviation of 9.41. 373 is 3.5 standard deviations above the expected value. That's an unusual result.

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

- 19) A candy company claims that its jelly bean mix contains 15% blue jelly beans. Suppose that the candies are packaged at random in small bags containing about 200 jelly beans. What is the probability that a bag will contain more than 20% blue jelly beans? 19) _____
- A) 0.0478 B) 0.0239 C) 0.0422 D) 0.9578 E) 0.9761

Answer Key

Testname: SAMPLE TEST 2

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