Name_____

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

Find the indicated probability.

1) The following contingency table provides a joint frequency distribution for a group of retired people by career and age at retirement. 1) _____

		Age at Retirement				
		50-55	56-60	61-65	Over 65	Total
Career	Attorney	12	48	95	34	189
	College Professor	9	47	75	40	171
	Secretary	21	45	63	49	178
	Store Clerk	18	44	70	50	182
	Total	60	184	303	173	720

Find the probability that the person was an attorney and retired before the age of 61.

A) 0.518 B) 0.317 C) 0.083 D) 0.067 E) 0.326

2) In a study, 43% of adults questioned reported that their health was excellent. A researcher wishes to study the health of people living close to a nuclear power plant. Among 14 adults randomly selected from this area, only 3 reported that their health was excellent. Find the probability that when 14 adults are randomly selected, 3 or fewer are in excellent health. 2) _____

A) 0.0537 B) 0.0242 C) 0.0597 D) 0.0839

3) A study conducted at a certain college shows that 62% of the school's graduates find a job in their chosen field within a year after graduation. Find the probability that among 5 randomly selected graduates, at least one finds a job in his or her chosen field within a year of graduating. 3) _____

A) 0.908 B) 0.200 C) 0.992 D) 0.620

4) A bag contains 6 red marbles, 3 blue marbles, and 7 green marbles. If a marble is randomly selected from the bag, what is the probability that it is blue? 4) _____

A) $\frac{1}{7}$ B) $\frac{1}{13}$ C) $\frac{3}{16}$ D) $\frac{1}{3}$

5) Find the probability of correctly answering the first 3 questions on a multiple choice test if random guesses are made and each question has 5 possible answers. 5) _____

A) $\frac{1}{243}$ B) $\frac{3}{5}$ C) $\frac{5}{3}$ D) $\frac{1}{125}$

6) The incomes of trainees at a local mill are normally distributed with a mean of $1100 and a standard deviation $150. What percentage of trainees earn less than $900 a month? 6) _____

A) 90.82% B) 9.18% C) 35.31% D) 40.82%

7) The table below describes the smoking habits of a group of asthma sufferers. 7) _____

	Nonsmoker	Occasional smoker	Regular smoker	Heavy smoker	Total
Men	385	46	89	39	559
Women	370	41	85	33	529
Total	755	87	174	72	1088

If one of the 1088 people is randomly selected, find the probability that the person is a man or a heavy smoker.

A) 0.580 B) 0.508 C) 0.542 D) 0.544

8) A tennis player makes a successful first serve 55% of the time. If she serves 5 times, what is the probability that she gets all her first serves in? Assume that each serve is independent of the others. 8) _____

A) 0.0226 B) 0.0185 C) 0.2516 D) 0.0503 E) 0.9497

9) 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. 9) _____

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

10) Based on meteorological records, the probability that it will snow in a certain town on January 1st is 0.327. Find the probability that in a given year it will not snow on January 1st in that town. 10) _____

A) 3.058 B) 0.673 C) 1.327 D) 0.486

11) The table below shows the soft drinks preferences of people in three age groups. 11) _____

	cola	root beer	lemon–lime
under 21 years of age	40	25	20
between 21 and 40	35	20	30
over 40 years of age	20	30	35

If one of the 255 subjects is randomly selected, find the probability that the person is over 40 years of age given that they drink root beer.

A) $\frac{5}{17}$ B) $\frac{6}{17}$

C) $\frac{2}{5}$ D) None of the above is correct.

12) You are dealt two cards successively (without replacement) from a shuffled deck of 52 playing cards. Find the probability that the first card is a King and the second card is a queen. 12) _____

A) $\frac{13}{102}$ B) $\frac{1}{663}$ C) $\frac{2}{13}$ D) $\frac{4}{663}$

Determine whether the events are disjoint and give a reason.

13) According to a survey conducted by an environmental organization, the probability that an eligible voter cares about environmental issues is 0.63, the probability that an eligible voter voted in the last election is 0.44 and the probability that an eligible voter both voted in the last election and cares about environmental issues is 0.30. Are caring about environmental issues and voting in the last election disjoint events? 13) _____

A) Yes, the probability that a voter cares about environmental issues and voted in the last election is zero.

B) No, 30% both care about environmental issues and voted in the last election

C) No, the probability that a voter voted in the last election is 0.44, but the probability that a voter voted in the last election given that they care about environmental issues is 0.48.

D) Yes, because P(C or V) = P(C) + P(V)

E) Yes, the probability that a voter cares about environmental issues is the same as the probability that a voter cares about environmental issues given that they voted in the last election.

Use summary statistics to answer the question.

14) Here are some summary statistics for annual snowfall in a certain town compiled over the last 15 years: lowest amount = 20 inches, mean = 50 inches, median = 43 inches, range = 80 inches, IQR = 53, Q1 = 20, standard deviation = 11 inches. Suppose snowfall was tracked for 5 additional years and the annual snowfall was found to increase by 20%. Find the new mean and standard deviation. 14) _____

A) Mean: 60 inches, SD: 11 inches

B) Mean: 40 inches, SD: 11 inches

C) Mean: 60 inches, SD: 13.2 inches

D) Mean: 40 inches, SD: 8.8 inches

E) Mean: 10 inches, SD: 2.2 inches

Find the z–score corresponding to the given value and use the z–score to determine whether the value is unusual. Consider a score to be unusual if its z–score is less than –2.00 or greater than 2.00. Round the z–score to the nearest tenth if necessary.

15) A body temperature of 96.8° F given that human body temperatures have a mean of 98.20° F and a standard deviation of 0.62°. 15) _____

A) –2.2; unusual B) 2.2; unusual

C) –2.2; not unusual D) –1.4; not ususal

Find the mean of the data.

16) Jody got a bank statement each month that listed the balance, in dollars, in her checking account. Here are the balances on several statements. 16) _____

$315.89	$486.78	$247.65	$357.35	$469.70
$512.81	$302.17	$372.42	$352.59	

Round your answer to the nearest cent.

A) $379.71 B) $357.35 C) $427.17 D) $488.19 E) $373.04

Answer the question.

17) A candy company claims that 16% of the jelly beans in its spring mix are pink. Suppose that the candies are packaged at random in bags containing about 400 jelly beans. A class of students opens several bags, counts the various colors of jelly beans, and calculates the proportion that are pink. In one bag, the students found 13% of the jelly beans were pink. Is this an unusually small proportion of pink jelly beans? Explain your response. 17) _____

A) This is an extremely unlikely result. It is 0.22 standard deviations below the mean.

B) This is not an unusual result. It is only 1.64 standard deviations below the mean.

C) This is a very unusual result. It is 0.05 standard deviations below the mean.

D) This is a very unusual result. It is 0.08 standard deviations below the mean.

E) This is not an unusual result. It is only 0.05 standard deviations below the mean.

Solve the problem.

18) Assume that women have heights that are normally distributed with a mean of 63.6 inches and a standard deviation of 2.5 inches. Find the value of the quartile Q_3. 18) _____

A) 67.8 inches B) 66.1 inches C) 64.3 inches D) 65.3 inches

19) 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. 19) _____

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

20) A history teacher assigns letter grades on a test according to the following scheme: 20) _____

A: Top 10%
B: Scores below the top 10% and above the bottom 60%
C: Scores below the top 40% and above the bottom 20%
D: Scores below the top 20% and above the bottom 10%
F: Bottom 10%

Scores on the test are normally distributed with a mean of 67 and a standard deviation of 13.2. Find the numerical limits for each letter grade.

A) A: Above 79
B: Between 70 and 79
C: Between 56 and 69
D: Between 50 and 55
F: Below 50

B) A: Above 79
B: Between 70 and 79
C: Between 56 and 69
D: Between 52 and 55
F: Below 52

C) A: Above 84
B: Between 74 and 84
C: Between 56 and 73
D: Between 50 and 55
F: Below 50

D) A: Above 84
B: Between 70 and 84
C: Between 56 and 69
D: Between 50 and 55
F: Below 50

Construct the requested confidence interval from the supplied information.

21) You want to estimate the average gas price in your city for a gallon of regular gas. You take a random sample of prices from 15 gas stations , recording an average cost of $2.07 and a standard deviation of $0.06. Create a 95% confidence interval for the mean price per gallon of gas. 21) _____

A) ($2.04, $2.10)
B) ($2.04, $2.08)
C) ($2.03, $2.11)
D) ($2.06, $2.08)
E) ($2.01, $2.13)

Use the given degree of confidence and sample data to construct a confidence interval for the population proportion.

22) Of 81 adults selected randomly from one town, 64 have health insurance. Construct a 90% confidence interval for the percentage of all adults in the town who have health insurance. 22) _____

A) (68.5%, 89.6%)
B) (73.0%, 85.0%)
C) (70.1%, 87.9%)
D) (71.6%, 86.5%)
E) (67.4%, 90.7%)

Construct the indicated confidence interval for the difference between the two population means. Assume that the assumptions and conditions for inference have been met.

23) A grocery store is interested in determining whether or not a difference exists between the shelf life of two different brands of doughnuts. A random sample of 100 boxes of each brand was selected and the shelf life in days was determined for each box. The sample results are given below. 23) _____

Brand A	Brand B
$\bar{x} = 2.1$	$\bar{x} = 2.9$
$s = 0.8$	$s = 1.1$
$n = 100$	$n = 100$

Find a 90% confidence interval for $\mu_A - \mu_B$, the difference in mean shelf life between brand A and brand B.

A) (–1.03, –0.58)

B) (0.08, 1.53)

C) (0.58, 1.03)

D) (–1.53, –0.08)

E) (2.1, 2.9)

Find the standard deviation for the given data. Round your answer to one more decimal place than the original data.

24) 15, 42, 53, 7, 9, 12, 14, 28, 47 24) _____

A) 15.8 B) 17.8 C) 29.1 D) 16.6

Answer Key
Testname: FINAL EXAM

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